

Understanding Academic Difficulties Among Undergraduate Medical Students

By

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I declare that the research contained in this thesis, unless otherwise formally indicated within the text, is the original work of the author. The thesis has not been previously submitted to this or any other university for a degree and does not incorporate any material already submitted for a degree.

Signed: 

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Abstract

This thesis takes a sequential design consisting of a mixture of study methods was used to explore the underlying predictors and drivers of academic underperformance to better inform future curriculum design, the development of support services and make medical schools more equitable spaces.

There are three components. 1) A scoping review of existing literature that explored the students' experiences of academic difficulties. 2) A retrospective cohort analysis of the demographic and early assessment performance data between 2013-2017 at a single UK medical school to identify predictors of decile placement at the end of the third year. 3) An interpretative phenomenological analysis study that explored the students' experiences of academic difficulty.

Medical students are often under-prepared for and lack the tools to manage their experiences of academic difficulties. This tends to negatively impact their self-worth and mental well-being, leading to the utilisation of maladaptive coping strategies. However, failure, particularly in assessments considered by students to reflect their future roles as doctors, can drive self-reflection, the development of improved learning strategies and can strengthen engagement with support. Early performance data can predict ongoing academic performance and adds to the growing literature that non-White students, students with disabilities and students who enter medical school from access courses are over-represented in the lower spectrum of results. The process of ranking students in deciles based on their performances during the course, a component of foundation job applications, was identified by students as particularly problematic due to its contributions to the competitive environment, reducing shared learning and adding to mental stress and anxiety.

Students who face academic difficulty find self-analysis challenging and welcome the provision of tools that may help identify their needs early in the course. Combining predictive assessment data analytics in a longitudinal mentorship support model has the potential to fill this role, and help faculty deliver individualised, tailored support to students. The student experience is not felt to be equitable, with financial pressures, the presence of mental health difficulties, the sense of a lack of belonging and the lack of access to socialised learning being identified as barriers to academic performance and potential contributors to differential attainment. Improving financial support, making mental health services more accessible, developing peer mentorship programs, increasing faculty diversity and developing institute-student partnerships may help combat this. Finally, this

thesis questions the continued use of ranking students as part of the foundation job application process in the UK and calls for the UKFPO to consider alternative strategies.

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Abbreviations

Abbreviation	Definition
ADHD	Attention Deficit Hyperactivity Disorder
A-Level	Advanced Level
AMECS	Association for Medical Education and Clinical Skills
ASD	Autism Spectrum Disorder
AT	Autism Traits
BMAT	Biomedical Medical Admissions Test
BME	Black and Ethnic Minority
BSMS	Brighton and Sussex Medical School
CbD	Case Based Discussion
CI	Confidence Interval
CSA	Case Study Assessment
EPM	Educational Performance Measure
GAMSAT	Graduate Australian Medical School Admission Test
GCSE	General Certificate of Secondary Education
GMC	General Medical Council
GP	General Practice
GPA	Grade Point Average

HE	Higher Education
HESA	Higher Education Statistics Agency
IMD	Index of Multiple Deprivation
IMG	International Medical Graduate
IMS	International Medical Student
IPA	Interpretative Phenomenological Analysis
ISFP	Improving Selection to the Foundation Programme
KT	Knowledge Test
LD	Learning Disabilities
LGBTQ+	Lesbian Gay Bisexual Transgender Queer/Questioning
LTC	Liberating the Curriculum
MCAT	Medical College Admissions Test
MMC	Modernising Medical Careers
MMI	Multiple Mini Interview
MS Teams	Microsoft Teams
MSC	Medical Schools Council
MTT	Module Tutorial Test
NHS	National Health Service
OMG	Overall Module Grade

OR	Odds Ratio
OSCE	Objective Structured Clinical Examination
PACES	Practical Assessment of Clinical Examination
POLAR	Participation of Local Areas
PTSD	Post-Traumatic Stress Disorder
RGEC	Research Governance and Ethics Committee
SAL	Student Approaches to Learning
SAQ	Short Answer Questions
SBA	Single Best Answer questions
SJT	Situational Judgment Test
SRL	Self-Regulated Learning
SSC	Student Selected Component
SSU	Student Support Unit
UCAS	University and Colleges Application System
UKCAT	UK Clinical Aptitude Test
UKFP(O)	UK foundation Programme (Office)
UKMED	United Kingdom Medical Education Database
UoB	University of Brighton
USMLE	United States Medical Licencing Examination

VIF	Variance Inflation Factor
WP	Widening Participation

1 Introduction

1.1 Context – Why is academic difficulty important?

Medicine remains a highly sought-after and competitive career, significantly oversubscribed with 23,710¹ applicants in the 2019-2020 application process with 7,391² places on offer. The fallout from failing students and students who struggle to complete the course is felt on an institutional, societal and personal level. There is a financial loss to the university and society if a student does not complete medical training, with estimated costs of £350,000 to train a doctor.³ High attrition rates may also be seen unfavourably by prospective students leading to less competitive applications. There is also the burden of time, resources and financial support for the university to ensure remediation options are available and resit exams organised.⁴⁻⁶ There are appeals processes, and on occasion, there can also be legal challenges when students are asked to leave the course.⁷ Academic difficulty also negatively impacts the students on an individual level affecting their mental well-being compounded by the financial debt.^{6,8,9}

There is significant interest in identifying and predicting which prospective students are best suited to becoming a doctor and how to distinguish the most desirable characteristics to inform admissions policies. In more recent years, there has been a global awareness of the need to diversify the medical profession by reducing social exclusivity to make the profession more representative of the population.¹⁰⁻¹² This has led to the introduction of widening participation initiatives to improve the awareness and accessibility of a career in medicine in students who have traditionally been underrepresented and make admission policies more inclusive.¹³⁻¹⁵

On entry, medical students have already had to demonstrate their ability to gain top grades to meet the entry criteria and show they are motivated, driven, and competitive. Yet many students encounter academic difficulties in which they are unable to meet the academic standards set for the preclinical or clinical stages of the course. Overall attrition rates vary across medical schools and range between 5-14%, with many more students failing assessments but supported to continue on the course.¹⁶⁻²⁰ Many theories have been developed to understand why students struggle academically—these range from focusing on students' characteristics to broader sociocultural and institutional barriers to success. How academic difficulty is conceptualised is important as it dictates the support available to students. Remediation in medical education has been criticised for being generic, lacking theoretical foundations, and having limited success.²¹

Addressing academic difficulties early is important, given the correlation between undergraduate underperformance and a greater risk of unprofessional behaviours, disciplinary proceedings, and fitness to practice hearings once qualified.^{22–25}

This chapter aims to lead the reader through medical students' journey from 'getting in' to medical school to 'getting through' the course. It also explores the impact of facing academic difficulties, their consequences and how they are supported. In this chapter, I introduce the broader literature on academic performance and attrition across higher education, highlighting the importance of situational, institutional and dispositional factors.^{26,27} Developing support in line with findings from this research may improve ways in which remediation is conceptualised and delivered. For the purposes of this thesis academic difficulty is conceptualised as relative under performance when compared to peers and as such will be based on student decile position.

1.2 Getting in – Admissions policies

The need for a selection process is evident with more applicants than places available and an aspiration to identify the most suitable candidates who make the 'best' doctors²⁸. Medical schools are aware that a wide variety of skills and personal characteristics are required to successfully navigate the medical course and, in time, become successful doctors. However, finding an objective assessment to predict which applicants will succeed remains challenging. Most medical institutions across the world have a selection process that incorporates factors such as; prior academic achievement, performance in general knowledge tests (in the form of aptitude tests), interviews and an analysis of the candidates' application documents (in the UK this takes the form of the UCAS (Universities and Colleges Application System) form/reference letter). Decisions regarding which selection tools to incorporate are based on their validity, reliability, acceptability and practicality/cost.²⁹ Predictive validity is the 'degree to which test scores accurately predict scores on a criterion measure',³⁰ for example, the degree to which A-level grades predict scores on an assessment at medical school.

1.2.1 Academic Threshold

Prior academic performance (in high school/A-levels) has been accepted as a strong predictor of university academic performance.^{31,32} Thus, the first barrier prospective students need to overcome is meeting the academic threshold, which has traditionally been based on GCSE and A-

levels results or Scottish Highers in the UK, and Grade Point Average (GPA) in the US to be accepted to interview for a place on a medical degree course.

This threshold has needed to increase over time; in 1980, most entrants were required to achieve ABB grades at A-level, which has now increased to a minimum of AAA grades (the current highest achievable grade being an A*), as well as including a varied range of GCSE A/B grades.³³⁻³⁵ For postgraduate entry, students must have obtained a minimum of a 2:1 honours degree (often specified to be in a relevant science degree) and for those who sat the International Baccalaureate, a score of greater than 36.³⁵

Behind this increase in academic threshold is the phenomenon of 'grade inflation' in which students gain higher marks without evidence of increased levels of academic attainment, which can mask the variance in student abilities. This can lead to a compression of grades towards the top end of the scale, termed 'grade compression',³⁶ which makes it harder to differentiate the candidates based on this scoring system alone. For example, the proportion of entrants with maximum AAA grades has incrementally increased from 14.6% to 65.2% between medical applicants in 1973-1980 cohorts to those in 2003-2005.²² For many medical schools; the entry requirements request that two of the A-levels are in Biology and Chemistry which is driven by historical papers that have suggested Biology, Physics or Chemistry as the most predictive of success or failure at medical school.³⁷⁻³⁹ This has been challenged by a more recent large UK-based multi-institution study in which these core sciences taken at A-level or Scottish Highers did not predict academic performance in the first year at medical school.⁴⁰ Some medical schools' admissions policies now include GCSE results, supported by findings from one study that identified incremental validity when predicting academic performance at medical school above and beyond A-level results.⁴⁰

The requirement for such a high academic threshold is supported in numerous studies. McManus et al. coined the term 'academic backbone' to describe the predictive link between prior academic achievement, progress through medical school, and beyond into professional exams as doctors (see Figure 1-1).²² This is supported by a meta-analysis undertaken in the US that showed positive predictive correlations between GPA and performance in written and clinical assessments throughout medical school and certification exams.⁴¹ However, a systematic review by Ferguson et al.⁴² cautions that prior academic performance accounts for only 23% and 6% of the variance in performance at undergraduate and postgraduate levels, respectively.

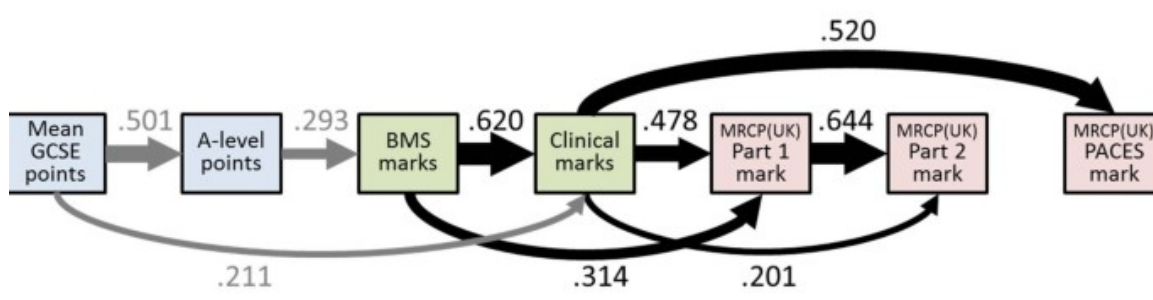


Figure 1-1. The 'Academic Backbone'. From McManus et al. (2013) – this is one of the path models of the University College London cohort of students taken from the study. The first two boxes indicate measures obtained prior to medical school, the following two boxes relate to academic performance while at medical school, and the last three boxes relate to post-graduate performance. The arrow thickness is proportional to the effect size, described numerically as standardised b-coefficients, all of which were positive. Each subsequent arrow and adjacent numerical value takes into account and is additional to the effect of the marks obtained in the prior box. For example, the effect of Clinical marks on MRCP part 1 marks takes into account and is additional to the effects of BMS marks.

Acronyms: BMS – Basic Medical Sciences course (knowledge based assessment in years 1 and 2 of the course), Clinical marks refer to performance scores in OSCE (Objective Structured Clinical Examination) assessments (in clinical years (3-5) of the course), MRCP – Membership of the Royal College of Physicians assessments (Part 1 and 2 are written knowledge assessments and PACES - Practical Assessment of Clinical Examination Skills is a practical assessment of clinical skills).

Academic achievement also only links to certain aspects of success as a doctor, such as research paper publications, time taken to complete membership exams to Royal Colleges, or to gain consultant status⁴³ and as Powis et al. state, “there is no study that considers excellence of doctor/patient interaction and clinical care as an outcome variable”.⁴⁴

Furthermore, regardless of whether there is predictive validity to pre-admission academic attainment, using school exam performance as a surrogate measure of intelligence is fraught with the reality that they are not equitable in that social class and gender are determinants of outcome independent of ability.⁴⁵ If academic prerequisites are reduced, there remains a need for an alternate way of assessing candidate suitability within the application and selection process.

Medical schools' admissions policies are tasked with creating a fair system. Lowering the academic threshold and removing subject prerequisites may provide greater access to people from lower social and economic backgrounds.⁴⁶ However, this must be balanced against the need to reduce the applicant pool to make the selection process manageable.²⁸ The implementation of supplementary testing in the form of aptitude tests has been introduced in attempts to combat the following issues; differentiating from a large pool of students attaining the highest grades⁴⁷, alternate qualifications and overseas students, the attainment advantage of independent school students,⁴⁸ and underrepresentation of students from lower socioeconomic backgrounds.⁴⁸ Additionally, prior academic attainment does not distinguish students with the desirable non-cognitive skills required of a future doctor necessitating alternate approaches to assessing for this, which are discussed below.

1.2.2 Aptitude tests

There are various aptitude tests used across medical institutes worldwide. For example, in the US, the medical college admissions test (MCAT) is widely used; this has four sections covering chemical and physical foundations of biological systems, critical analysis and reasoning skills, biological and biochemical foundations of living systems and psychosocial, social and biological foundations of behaviour.⁴⁹ In the UK, the BioMedical Admissions Test (BMAT), UK Clinical Aptitude Test (UKCAT) and Graduate Australian Medical School Admissions Test (GAMSAT) are the more frequently used aptitude tests. Table 1-1 summarises the differences between the three.

Table 1-1: A comparison of the descriptions and contents of the aptitude tests used in the UK, taken from Harris et al. 2015.⁵⁰

Tests with a significant non-knowledge-based component	Description	Duration	Content
UK Clinical Aptitude Test (UKCAT)	'The UKCAT does not contain any curriculum or science content. It focuses on exploring the cognitive powers of candidates and other attributes considered to be valuable for health care professionals.' www.ukcat.ac.uk/	2 hours	Verbal, quantitative and abstract reasoning, decision analysis and situational judgement.
Biomedical Medical Admissions Test (BMAT)	'BMAT is a subject-specific admissions test for applicants to medicine, veterinary medicine and similar courses at universities.' www.admissionstesting-service.org/	2 hours	Aptitude and skills, scientific knowledge and applications, and a writing task (in a scientific theme).
Graduate Australian Medical School Admissions Test (GAMSAT)	'GAMSAT evaluates the nature and extent of abilities and skills gained through prior experience and learning, including the mastery and use of concepts in basic science as well as the acquisition of more general skills in problem solving, critical thinking and writing.' http://gamsat.acer.edu.au/gamsat-uk/	5 hours 30 minutes	Reasoning in humanities and social sciences, written communication and reasoning in biological and physical sciences.

There has been much debate regarding the benefit of these aptitude tests, with numerous studies conducted to assess their validity and reliability. The results of these studies have been varied and, at times, contradictory. In the US, the MCAT is accepted as a good predictor of academic performance in medical school and medical licensing examinations.⁵¹⁻⁵⁵ A meta-analysis looking at the predictive validity of the MCAT showed a medium predictive effect for both basic science/preclinical outcomes and clinical/clerkship outcomes.⁵⁴ The MCAT has also been shown to explain double the variance in medical school grades compared to GPA, as well as being a good predictor of performance at the national licensing exam in the US (USMLE).^{54,55} The USMLE is a three-part national licensing examination; Step 1 is taken two years into medical school to assess the understanding and application of basic sciences to medical practice; step 2 assesses clinical

knowledge and its application under supervision and is taken at the end of medical school. Step three is taken after a year of residency and aims to assess the ability to independently apply their clinical skills and knowledge. The MCAT is stronger at predicting Step 1 with a strong predictive validity coefficient than the subsequent examinations, which was medium.^{54,55} Given these findings that the MCAT provides a substantial increment of predictive validity alongside GPA scores, it remains a central component of the US application process.⁵⁵

In the UK, the predictive validity of aptitude tests has been more conflicted. The UKCAT is the most widely used aptitude test, followed by the BMAT, with only a few medical schools using the GAMSAT. A study of two medical schools in Scotland did not show any correlation between the UKCAT total or subtest scores and end-of-year one exam scores,⁵⁶ supporting similar findings from a study of a cohort of students in Nottingham.⁵⁷ However, the largest study in the UK, the UKCAT-12 Study, analysed the data of nearly 5,000 students across 12 medical schools, finding that performance at the UKCAT correlates with first-year performance at medical school.⁴⁰ The authors concluded that it provides incremental validity after taking educational attainment into account and therefore provides sufficient added value to the selection of candidates.⁴⁰ These findings were subsequently supported by two longitudinal studies that found that UKCAT verbal and quantitative scores showed stronger relationships than prior academic attainment or interview score with final course outcomes,⁵⁸ and when controlling for prior educational attainment, were significantly predictive of most aspects of undergraduate performance.⁵⁹ Generally, the consensus agrees that the UKCAT score's main association is with the knowledge-based written examinations rather than clinical performance.^{40,58,60} Another purported strength of the UKCAT is that it is more equitable, does not suffer from bias favouring certain student demographics and can lead to an increase of successful applicants from underrepresented sociodemographic groups and widening access to medicine.^{58,59,61}

The other commonly used aptitude test is the BMAT. Emery and Bell from the University of Cambridge published data supporting the positive predictive validity of the BMAT with pre-clinical medical performance⁶² deeming it a fair and equitable test⁶³. However, both these findings have been questioned in a critique of the statistical analysis by McManus et al.⁶⁴ They were concerned with the methodology of the analysis, criticising the lack of reliability data of BMAT, as well as assumptions made by the authors given the lack of evidence of incremental predictive validity on top of prior educational attainment. McManus et al. ran their own analysis finding that the majority of the predictive validity came from part two of the BMAT, which assesses scientific knowledge, rather than part one, which tests aptitude. They further argue that section two is

similar to tests such as A-Levels and GCSEs and that these standard academic assessments have been proven biased by sex, ethnicity and socioeconomic background.^{48,65} Then, the likelihood of similar biases being present is high.⁶⁴ The GAMSAT has not shown robust evidence that it was a good predictor of performance at medical school in Australia.⁶⁶

Aptitude tests remain controversial, with significant criticism regarding validity and reliability.^{50,67} Currently, aptitude test scores are used as a cut-off, rejecting candidates below a pre-determined score, with each medical school autonomous in setting their own standard. One study that suggested this approach found that participants who scored below the cut-off had a high risk of failing at least one year at the first attempt but accepted that the 'number needed to reject' is high (1.18), indicating that for almost every student who fails another candidate with the same score will likely have passed all years without resitting.⁵⁹

Harris et al. criticise the value given to aptitude tests in the application process for lack of predictive validity compared to tests that assess knowledge acquisition and reasoning, citing the strength of the predictive validity of A-levels.⁵⁰ They advocate implementing a national scientific multiple choice question, knowledge-based test, taken in conjunction with A-levels for selection into medical school to overcome the lack of discriminatory value of A-level. ⁵⁰ However, they appear to ignore the likelihood that this approach risks the same bias that exists in the current markers of prior academic attainment and will more likely re-affirm the over-representation of students who are either White, from an independent school or higher socioeconomic background and as such would be a step in the wrong direction.

1.2.3 Interviews

Interviews have mainly been used to assess the non-cognitive skills of applicants for medical school. Defining the qualities of the 'ideal' doctor is complex, and there remains a lack of consensus in the literature.⁶⁸ One study came up with 87 positive qualities associated with a successful doctor⁶⁹ which differ depending on the perspective; from a patient's perspective, the 'ideal' physician was described as confident, empathic, humane, personal, forthright, respectful and thorough.⁷⁰ Medical student's felt that motivation to be a doctor, empathy, composure under pressure, good communication, patient-centred care, professional behaviour, critical thinking and perseverance as the most important factors^{71,72} Regulatory bodies, such as the GMC in the UK, have created guidance documents describing what it deems to be the desirable qualities of future doctors to aid medical schools' admission policies and improve transparency for applicants.^{73,74}

This has led to interviews being developed to evaluate: communication/interpersonal skills, punctuality and presentation, decision-making and coping with ambiguity, ethics, maturity, motivation/interest in medicine, non-academic achievement and behaviours (especially under pressure).^{28,75–80}

Critics of traditional interview methods such as personal or group interviews have cited low inter-rater reliability,^{78,81–83} evidence of biases due to interviewer rating tendency (lenient or severe), or the similarities of the applicant's demographics (gender, race, appearance) to the interviewers,⁸¹ and a lack of evidence of predictive validity of performance at medical school.⁸⁴ A further issue reducing reliability is the generalisability across interview sessions had also been seen to be low.⁸⁵

Structured interviews with standardised questions have evidence of higher reliability than unstructured interviews.^{81,83} This has led to Multiple Mini Interviews (MMI)⁸⁶ taking over from the traditional interview format for medical schools across the UK. MMIs consist of several short stations, each with a different interviewer, to assess differing non-cognitive attributes and characteristics discussed above. The stations are designed to ensure they do not require or assess specific learned knowledge. There is no definitive structure, but a systematic review of MMIs in health-related university courses showed that they consisted of a range of 4-12 stations, with ten stations being the most commonly used, either one or two assessors per station and each station averaging at 8 minutes.⁸⁷ MMIs do not require more examiners or cost more than traditional panel interviews and can be completed over a shorter period.^{87,88} Reliability scores have varied between papers, from moderate,⁸⁹ to high,⁹⁰ and the consensus is that they are acceptable.^{87,91} Whilst the reliability of individual stations may be low, this increased with multiple stations; for example, the reliability coefficient of the average performance score across 12 stations in one study was high at 0.8.⁸⁴

The evidence for predictive validity is not exhaustive, and whilst interview scores may not correlate strongly to academic outcomes, they correlate with subjective clinical assessments.^{76,78} MMIs were found to be the best predictor of clinical performance ratings and ethical/clinical decision-making scores in the Canadian licencing examination.⁹² Another Canadian study found that MMI scores had a statistically positive predictive value of the percentage of stations passed by the participants in the OSCE component of the Licensing Examination as residents as well as trending towards being statistically predictive of the total score.⁸⁴

1.2.4 Personal statements and Letter of reference

There is little evidence to support using either letters of reference or personal statements for student selection. This is due to poor predictor validity^{37,93–95} and reliability.^{96,97} The content of personal statements has been shown to be heavily influenced by those supporting the candidate, and the lack of a standardised format makes comparing applicants' characteristics very challenging.^{68,98}

1.2.5 Personality tests

Some authors have proposed utilising the positive findings from human resources literature in adopting personality tests to aid in medical school application selection.^{28,99} However, there are issues adjusting these to medical admissions policies and deciding which constructs to use.^{42,100} One of the more widely used tests is the Big Five Factor Inventory, composed of conscientiousness, openness to experience, neuroticism, extroversion and agreeableness. Only conscientiousness has demonstrated any predictive validity, and none have shown this in a medical setting.¹⁰¹ Even when there is evidence of a statistically significant association between a psychosocial variable and assessment outcome, the direction of correlation is unclear. For example, leadership has been shown to be related to GPA scores, but the direction of the correlation was unclear; i.e. was having the trait of being a leader the cause of a good GPA score or does having a high GPA make strong leaders?¹⁰² There is no evidence that personality tests have predictive validity for medical student performance or professionalism.

Despite this, Bore et al. presented a potential admissions model for medical schools to apply in selection processes that include personality traits.²⁸ They propose a cut using academic achievements to select the top 10% of applicants, followed by a stepwise selection based on cognitive ability (using tools such as UKCAT) and non-cognitive variables of personality, including agreeableness, conscientiousness, neuroticism, moral orientation and a lie scale to address the 'fake good' responses.²⁸ Powis et al. support this model even after acknowledging the lack of predictive validity, believing that personality or non-cognitive tests can be utilised to select out applicants represented in the extreme ends of the distribution of trait scores.⁹⁹ By doing so, applicants demonstrating traits of psychological vulnerability (inability to handle stress appropriately; low resilience), high levels of neuroticism, low levels of conscientiousness, extreme detachment or emotional involvement and high levels of impulsiveness or permissiveness should

be excluded from medical school.⁹⁹ Although this has not been taken on in admissions policies to date.

1.2.6 Widening Participation/Widening Access

“80% of medical students come from only 20% of high schools.”¹⁰³

Medicine has traditionally been an elitist course, with most students coming from affluent backgrounds, and there is a need to become more inclusive. The hope is that this will help better represent the population and improve the care provided. Whilst medical school cohorts are now more diverse, there is still a significant underrepresentation of students from lower socioeconomic classes.¹⁰⁴ There is good evidence that students from less affluent backgrounds are more likely to obtain lower school grades,^{22,105} which means they are unable to reach the academic threshold even to be considered for a place in medicine. Poorer educational facilities, larger classroom sizes, and less intensive academic support and encouragement are some of the factors that contribute to lower state school exam performance.⁴⁶ Additional barriers to disadvantaged students applying to medicine include the lack of encouragement, financial constraints and lower aspirations.⁴⁶

Widening participation is described as ‘the process of encouraging underrepresented socioeconomic groups to apply for higher education’^{13,14} by actively targeting and recruiting under-represented students through various programmes. These include improving awareness of what it takes to study medicine through teaching sessions and educational experiences. These are aimed at those who meet specific criteria influenced by deprivation scores that categorise those students from the lowest financial backgrounds using POLAR and IMD scores (Participation of Local Areas (POLAR quintiles)/ Index of Multiple Deprivation (IMD) quintiles) as proxies for socioeconomic backgrounds, family educational status and socioeconomic status. There are schemes such as the UKWPMED (UK Widening Participation in Medicine) scheme¹⁰⁶ consisting of a collaboration of UK medical schools that offer outreach programmes to provide practical assistance to students seeking financial support, teacher/career advisor guidance, mentorship, interview practice sessions, application-focused support and links to the local hospitals to develop structured work experience opportunities.^{46,107} Widening access is sometimes used interchangeably for widening participation but more accurately reflects the changes in policies and programmes designed to improve the fairness of the selection process, which prioritises

students from underrepresented backgrounds for selection for interview and reducing the required academic criteria for entry to the course.^{106,107}

Several studies support this approach, identifying that students who went to non-selective schools outperformed those from selective schools once pre-admission educational attainment is corrected for.^{40,108,109} There are a couple of theories behind this phenomenon, the 'Big Fish Little Pond Effect'¹¹⁰ in which academic aspiration is higher in those who achieve despite the less academic environment or the idea that students are more supported in selective schools and therefore do less well when that support is no longer present at medical school.⁴⁰ It is also important to interpret these results in context as state-funded school attendance does not necessarily reflect educational and/or social disadvantage.¹⁰⁹

One of the ways in which medical schools have attempted to improve access is through the creation of gateway courses, also known as Access courses which have increased in numbers in recent years. These courses consist of an extra year before entering year one or are integrated into the first two years of study.¹¹¹ The structure and curriculum for this year appear to vary significantly between courses but tends to cover study skills, professionalism, psychology and clinical skills.¹⁰⁷ Course completion guarantees students a place at medical school, at which point any additional support or learning opportunities cease.¹⁰⁷

There have been encouraging signs that these initiatives are beginning to improve the diversity of medical school students with recent data from the UK Medical Education Database (UKMED) that collates undergraduate and postgraduate performance data of UK medical students and trainee doctors, and the Medical Schools Council selection alliance showing an increase of 29% of students from Black and Minority Ethnic (BME) background (including a 58% increase in students of Black heritage). There has also been an increase in students from the lowest POLAR quintile (35%), the lowest IMD quintile (46%), state schools (14%), whose parents do not have HE qualifications (11%) and those with disabilities (33%).¹¹² However, within the report, they urge caution as the numbers for some of these demographic groups are small. They also caution that this should not distract from work needed regarding student support and retention.

The small amount of research currently available has shown higher attrition rates for students who attended gateway courses^{113,114} and lower scores in their relative academic performance at medical school compared to their peers on standard entry courses.¹¹¹ Fyfe et al. state 'we urgently need to shift the practice of widening participation from a myopic focus on recruitment and selection ("getting in") to include the student experience ("getting through"), differential attainment, and career progression ("getting on")'.¹¹⁵ Challenging medical institutes to shift the

discourse from assessing progress based on the simple number of students admitted to focusing on the equity of those students' experience moving from "diversity in medicine" to "inclusion in medicine".¹¹⁵

1.3 Getting through – Academic difficulties at medical school

Improving admissions processes alone will not necessarily reduce the need for student support and remediation once at the medical school. Some of the difficulties and deficiencies occur during the student's time at the institution and maybe, in part, be a consequence of the medical education processes and systems.⁴

Students face difficulties for various reasons, which we explore in this next section to understand how academic difficulty is conceptualised and the impact this has on the support made available to students.

1.3.1 Higher Education Attrition Literature

In attempts to understand why students struggle in higher education and some leave the course, numerous theories and explanatory models have been produced. One of the most influential was Tinto's student integration theory,¹¹⁶ which hypothesised that the greater the student's social, academic and institutional integration, the stronger their commitment to completing the degree and thus the less likely they will be to drop out. He stated that students whose academic experiences conflicted with previously established beliefs found integration more difficult.¹¹⁶ External factors such as family support, finances, and employment commitments were also noted to influence students' integration and experience in tertiary education.^{117,118}

Carroll et al. (Figure 1-2) developed this further, categorising the factors contributing to student attrition into situational, institutional and dispositional factors.²⁶ Bowles and Brindle's systematic review refined and extended the model to include belongingness as an important facilitating factor in student retention.²⁷ Situational factors, including employment pressures, having dependents, and poor health, all contributed to the reduced time allocated to study.²⁶ Institutional factors comprised of institutional characteristics such as climate, size, course policies, staff availability and positive relationships, and the availability of support services.²⁶ Finally, dispositional factors included student motivation and clear goal setting.²⁶ Career-related goals helped maintain student motivation whilst belongingness was seen to be an important facilitating

factor for student retention and encompasses the institution’s culture, positive student-teacher relationships, relationships with peers, campus involvement and a sense of belonging.²⁷

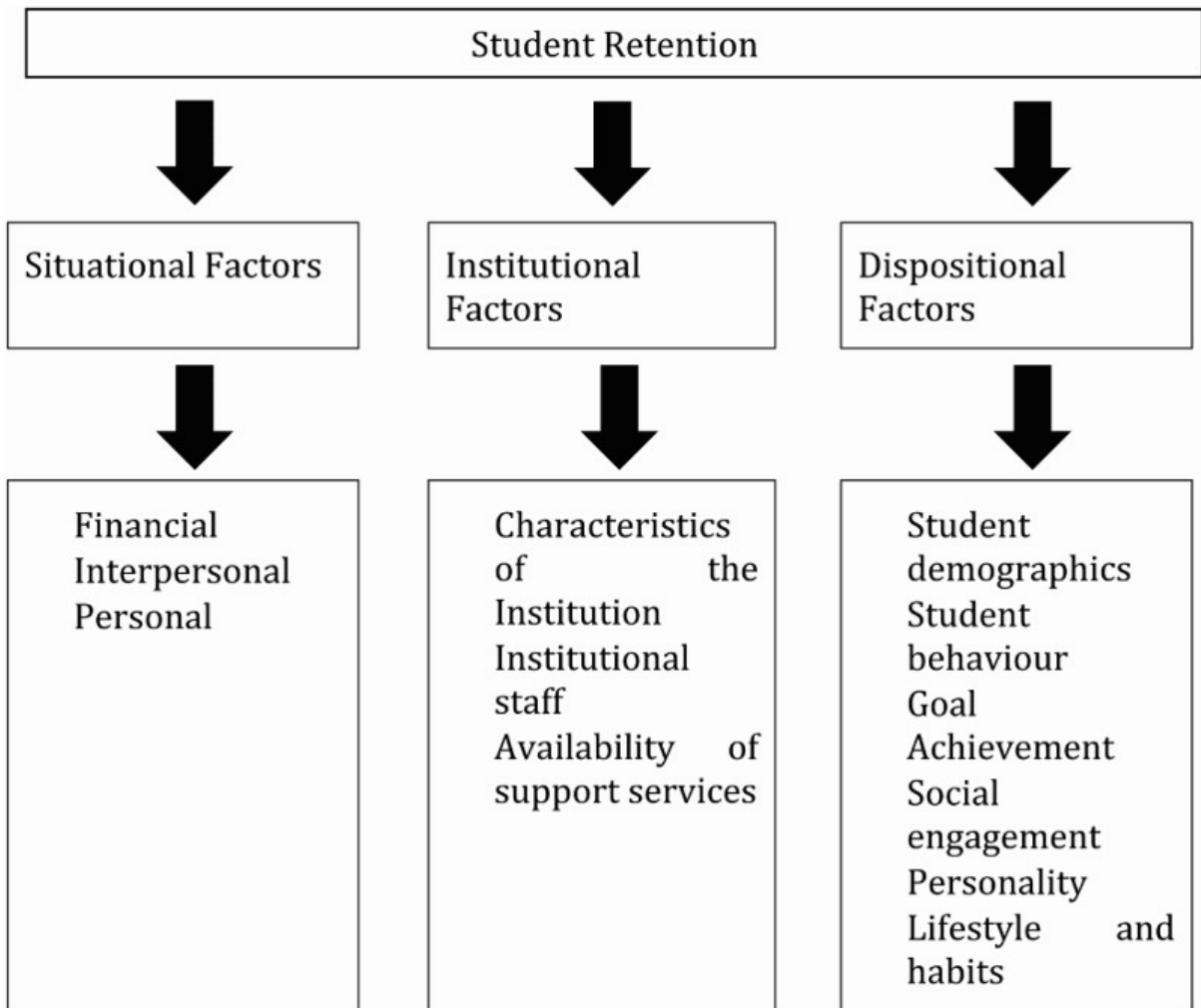


Figure 1-2: Carrol et al.'s student attrition model (2009). The model identified the situational, institutional and dispositional factors that impact the ability of students to complete the course

Richardson et al.'s systematic review and meta-analysis³² analysed the psychological correlates of higher education academic performance and the theories underpinning the complex interplay between personality traits, motivational factors, goal setting, effort regulation (ability to maintain effort in the face of challenges), self-efficacy (a term coined by Bandura¹¹⁹ describing the importance of the belief in one’s ability to complete tasks), and use of self-regulated learning (SRL) strategies to explain whether students attribute their academic performance to internal or external factors.³²

Regarding personality traits associated with academic performance, two meta-analyses support each other, concluding that agreeableness, conscientiousness and openness correlated with good academic performance.^{32,120} Further still, conscientiousness (dependability and will to achieve)

added as much predictive value as intelligence when controlling for secondary school performance.¹²⁰ Conversely, procrastination (the tendency to postpone the completion of tasks) had a negative association with academic performance.^{32,121} Personality traits are perceived as relatively fixed, exerting a constant influence on academic performance and less able to be modified.³²

What drives student motivation to study has been described by Eccles and Wigfield's Expectancy Value Theory,¹²² in which motivation is driven by a combination of the student's expectations for success and the subjective task value. Thus students are more likely to pursue an activity if they see value in it and expect to do well. The value of the task is dependent on the importance of doing it well, the usefulness/relatedness to future goals, the personal enjoyment and the potential negative cost of completing it (e.g. time or potential psychological harm).¹²² The personal enjoyment of fulfilling the task is termed intrinsic motivation in self-determination theory.¹²³ It is considered an evolved propensity that can flourish in the right circumstances but can also be undermined by adverse circumstances. Social-contextual events such as feedback or rewards provide the sensation of competence, enhancing intrinsic motivation, yet negative feedback can inhibit this. Linked to this is the type of goal the students pursue: those aiming to better themselves (intrinsically motivated) are more motivated than those focused on achievement or competition (extrinsic).¹²⁴ Intrinsic motivations can be maintained through stimulating and challenging task engagement in which the student feels competent and autonomous and thus facilitates optimal learning.¹²³ Extrinsic motivation can vary depending on its relative autonomy. For example, a student who does their work because they grasp its value to a chosen career entails personal endorsement and a feeling of choice. In contrast, completing the work to adhere to the authority's control, i.e. fear of a punitive response, involves compliance, lacks autonomy and can be demotivating.¹²³

It is also important to understand how students attribute the causes of their academic performance, in which motivational factors, self-efficacy and self-regulated learning are intertwined. Attribution refers to how students explain their academic performance; for example, some may explain their academic failings due to intrinsic weaknesses such as a lack of effort or ability. Others may externalise the cause, citing bad luck or unfair examinations. Rotter defined these tendencies in his theory of locus of control,¹²⁵ which explains the degree to which students believe they are responsible and accountable for their actions and thus have control of the outcome. Intertwined with this is a student's belief in their ability to succeed, termed self-efficacy.¹¹⁹ Students with strong academic self-efficacy, i.e. strong beliefs in their abilities to

perform actions associated with their study, perform better than those with lower efficacy expectations and are more likely to persevere in the face of difficulty.^{126,127}

SRL refers to the cyclical self-directive processes and self-beliefs that enable learners to transform their mental abilities into academic performance.¹²⁸ SRL encompasses metacognitive, motivational and behavioural strategies to improve learner processes within a cycle of three interrelated phases (see Figure 1-3). The forethought phase processes include effective goal setting, strategic planning, self-motivational beliefs such as self-efficacy beliefs, outcome expectations, task interest or value and goal orientation. These influence the performance phase, strategic processes that are utilised, and metacognitive monitoring. The final self-reflection phase includes self-evaluation, causal attribution and reflecting on their emotional responses, allowing learning practices to evolve.¹²⁸ In this cycle, the processes that occur before the learning task impact the task's performance, affecting how learners react to and reflect on their successes and failures.



Figure 1-3: Phases and subprocesses of self-regulation. From "Motivating Self-Regulated Problem Solvers" by B. J. Zimmerman and M. Campillo, 2003, in J. E. Davidson and R. J. Sternberg (Eds.), *The Nature of Problem Solving*, p. 239. New York: Cambridge University Press. Adapted with permission.¹²⁹

Finally, student approaches to learning (SAL) models further categorise learning strategies as 'deep' if they encompass critical analysis and information synthesis, in comparison to 'surface' strategies such as memorisation or 'strategic' strategies whereby students choose which approach to take depending on how they value the task.¹³⁰⁻¹³²

Student success appears to depend on their motivation, goals, belief in their abilities, ability to persist when faced with challenges, and ability to develop self-regulated strategies to succeed.

1.3.2 How is a struggling student conceptualised in medical education literature?

Within medical education literature, there has been a specific focus on the academic, psychological, and social/contextual factors outlined below.

1.3.2.1 Academic factors at medical school

Medical students are highly academically successful; thus, academic difficulties and, in some cases, failure comes as an unexpected shock. This lack of experience or consideration of failure means they lack the tools to navigate them in productive ways.¹³³ Students tend to utilise the learning strategies that were successful in passing their prior academic milestones (secondary school assessments or prior degrees).^{134,135} There is often resistance to change in the face of academic failure and a tendency to spend more time utilising these inefficient strategies. New strategies take time to develop with no perceived guarantee of success; the fear of wasting the limited time available to study large amounts of information becomes a barrier to change.¹³³

The literature describes how students in their early years at medical school struggle with knowledge and skill gaps, integrating large amounts of material, poor time management, self-regulation and approaches to learning.^{119,123,130-132,136-138} Berkhout et al. adapted the SAL model to medical education, exploring the journey from novice to experienced learners. They highlighted that experienced learners took control of their learning with more focused goals and efficient learning strategies.¹³⁹

The transition from pre-clinical learning to clinical practice has also been noted as challenging. The authors of a recent review of research into the transition to learning in the clinical environment cautioned against limiting the conceptualising of 'transition' as 'a maladaptive struggle' and drew

attention to the benefits of reframing it as a positive transformative experience.¹⁴⁰ Insufficient knowledge remains an issue within the clinical years as well as difficulties with patient presentation skills, examination skills, the ability to apply knowledge to clinical scenarios when formulating management plans, communications skills and issues with professionalism.^{141,142}

Overall, female and white students performed better at medical school even after taking prior educational attainment into account.^{40,42,143–145} The gender discrepancy is most evident in clinical assessments such as the Objective Structured Clinical Examination (OSCE) and Practical Assessment of Clinical Examinations (PACES).^{145–150}

Only a handful of studies have considered the predictive value of early assessment performance on later performance at medical school. One single institution retrospective study from the US found that the lower the score obtained in the first two modular exams in year one, the higher the likelihood of repeat referral to the academic board in future.¹⁵¹ Cleland et al. similarly found that assessment performance in the second year of the medical course in Aberdeen was predictive of written and clinical examinations in years three and four; in particular, failure in the OSCE in year two was predictive of failure in subsequent OSCEs in year three and four.¹⁵² Krupat et al. showed that multiple appearances in the lower quartile of academic performance in assessments in year one were predictive of academic performance in clerkship knowledge assessments and clinical performance in OSCE scores.¹⁵³ Although they caution that 8% of students who performed poorly in the first year went on to perform extremely well in clerkship years and vice-versa; 9% of students who performed well in the basic science assessments in year one struggled to learn in the clinical environment.¹⁵³

More recently, there has been a focus on institutions to reflect on how they conceptualise student difficulties and to what extent this impacts learners.⁴ This has led to a shift away from a simplistic deficit model in which the learner is seen as deficient, in need of treatment to a more holistic approach looking at how contextual factors influence performance (this is covered in more detail in chapter 6).^{5,133,154}

1.3.2.2 Concerns with professionalism and patient care

*“Professionalism is important to the future of medicine. It stands to define our interactions with patients, shape their perceptions of physicians and drive the overall success of medicine in society”.*¹⁵⁵

Ensuring high professional standards are of great concern to medical schools and the GMC and is an important component of medicine's contract with society.¹⁵⁶ Unprofessional behaviours significantly adversely affect doctor-patient relationships and staff relationships, impacting patient safety and quality of care.¹⁵⁷⁻¹⁵⁹ Whilst the extreme nature of the cases, such as Harold Shipman, who was convicted of the murder of 250 of his patients, are rare, there remains a significant amount of doctors and health care workers referred to fitness to practice hearings. The GMC reported 8,573 fitness-to-practice enquiries in 2018, with 157 doctors erased or suspended from the medical register.¹⁶⁰

Teaching and assessing professionalism is challenging due to difficulties in defining what is meant; in its abstract theoretical construct, it is a set of internal virtues, characteristics and attitudes and pragmatically relates to behavioural conduct.¹⁶¹ The latter is easier to define and, as such easier to teach and assess. However, its limitations include the lack of a shared 'gold' standard¹⁶² from those assessing the students and the lack of consideration for the students underlying attitudes with the potential for students to 'fake' the desired behaviours without actually believing them.¹⁶³ To help guide doctors and institutes in defining professional standards in the UK, the GMC and Royal College of Physicians have released documents describing what they believe are the key attributes of medical professionalism (see Figure 1-4 for a summary).¹⁶⁴⁻¹⁶⁶

Number	Aspects of professionalism currently included in the basket of professional qualities	Remarks
1	Knowledge	
2	Clinical skills	
3	Judgement	Application of critical reasoning to a problem presented by a patient in order to arrive at an opinion about how to solve or ameliorate that problem
4	Commitment	To patient care, to continuous improvement, to striving for excellence etc
5	Moral contract	Substituted for social contract and morality
6	Mutual respect	
7	Integrity	
8	Compassion	
9	Altruism	
10	Individual responsibility	
11	Appropriate accountability	
12	Continuous improvement	
13	(Striving for) excellence	
14	Partnership with other healthcare team members	
Number	Aspects of professionalism discarded from the basket of professional qualities	Remarks
1	Mastery	Could also suggest control, authority, power, and superiority
2	Autonomy	Apart from independence and freedom from external control, it could also suggest the right to self-governance, an appeal to personal authority, the authority to act independently of both the wishes of the patient and the preponderance of medical evidence
3	Privilege	Could suggest special freedom or immunity from, for example, liability
4	Self-regulation	Judged irrelevant to the essential values and behaviours that underpin professional practice

Figure 1-4. Attributes of professionalism (Taken from Van Mook et al. 2009. 168 Royal College of Physicians summary of professionalism)

In medical education, professionalism is often considered within ‘Professional Identity Formation’ (PIF)¹⁶⁷ in which the identity from student to physician develops over time as:

*“A representation of self, achieved in stages over time during which the characteristics, values, and norms of the medical profession are internalized, resulting in an individual thinking, acting and feeling like a physician”.*¹⁶⁸

Teaching and evaluating professionalism at medical school is crucial as there are clear associations between unprofessional behaviour at medical school and unprofessional behaviour in clinical practice.^{23,25} In the US, students who received comments regarding unprofessional behaviour at medical school were twice as likely to be disciplined by the state medical board as practising physicians.²³ Several later studies identified the behaviours of most significant concern were poor reliability and responsibility (unreliable attendance at clinics and not following up on activities related to patients), a diminished capacity for self-improvement (failure to accept criticism, argumentativeness and displays of poor attitude) and poor initiative and motivation.^{25,169} Alongside unprofessional behaviour, lower MCAT scores and lower grades (GPA) were also significant predictors of disciplinary action.²⁵

Padapakis et al. advocate for better evaluation tools of personal traits of medical students that may influence professionalism with early identification and remediation key.²³ To combat approaches that rely on desired professional standards being passively absorbed by students through the observation of correct behaviours by role models or through parables,^{23,170} the

authors encourage and describe how teaching and evaluating professionalism needs to be an explicit component of the curriculum. They advocate for the need for clear expectations, the provision of experiences for students to learn from and assessments that evaluate their behaviours from a multitude of perspectives, including colleagues, supervisors and patients that can be feedback to support behaviour change (see Figure 1-5).¹⁷⁰

Remediating unprofessional behaviours is challenging, and there is growing evidence of the benefits of teaching SRL techniques to help address these behaviours (which is discussed in more detail in section 1.3.3.2.1.3).

Setting expectations
White-coat ceremonies
Orientation sessions
Policies and procedures
Codes and charters
Providing experiences
Formal curriculum
Problem-based learning
Ethics courses
Patient–doctor courses
Community-based education
International electives
Hidden curriculum
Role models
Parables
The environment as teacher
Evaluating outcomes
Assessment before entry into medical school (multiple medical interview)
Assessment by faculty
Assessment by peers
Assessment by patients (patient satisfaction)
Multiperspective (360-degree) evaluation

Figure 1-5 Outline of how to evaluate and teach professionalism. (Taken from Stern and Papadakis 2006)

1.3.2.3 Psychological factors

Studies investigating psychological factors have centred around stress, mental health and support.^{171,172} Academic difficulties impact students' mental well-being evoking sensations of shame, anxiety and loss of self-worth.¹⁷³ Due to these feelings, there is a tendency towards social isolation which further compounds the issue.^{174,175} This can lead to a deterioration in their mental health with an increased incidence of mental health disorders, including depression and anxiety disorders, and impact their ability to engage with support opportunities and remedial services.^{5,8}

Research has revealed a high prevalence of distress among newly-qualified doctors, with many medical students experiencing substantial distress prior to qualification.⁹ Worryingly, there are clear links between the course's negative impact on student mental well-being, as medical students have lower distress scores than non-medical students on commencing medical school but graduate with higher levels of depression and burnout than those who complete non-medical courses.⁸ This appears to be a global issue,^{176–180} that must be taken into consideration by medical schools attempting to diversify their student intake, especially given the evidence that international medical students experience more psychological distress than home students.¹⁸¹ The mental health of students also impacts their ability to perform to their best abilities. Mental distress is linked with lower academic self-efficacy and difficulties with cognitive function, memory and concentration, impacting study progress and higher attrition rates.^{127,182,183}

1.3.2.4 Differential attainment and additional difficulties faced by subgroups of medical students

Differential attainment refers to the unexplained variations in attainment levels of various cohorts of people influenced by factors they have no control over, including; age, gender, ethnicity, the presence of disabilities, and socioeconomic backgrounds. Historically this has been described as an "attainment gap" and will be presented as such in sections describing prior studies. However, the terminology of an "awarding gap" will be used when describing the results in the studies within this thesis and within the discussion chapter. This later term acknowledges the structural factors that affect the gap which are explored in more detail in the discussion chapter in section 6. Several recent studies have focused on the experiences and barriers to learning of under-represented sub-groups of medical students. These include students from ethnic minority backgrounds, mature students, students with learning difficulties, LGBTQ+ students, and international students.^{184–187}

1.3.2.4.1 Ethnic minority students and socioeconomic background

Many studies have looked at the ethnicity attainment gap in medicine. However, dividing by ethnicity is fraught with difficulty as ethnicity and identity are complex and should not be confused with nationality or migrant status and should be differentiated from race.¹⁸⁸ In the meta-analysis from Woolf, they used the description from Senior and Bhopal that ethnicity:

*“implies one or more of the following: shared origins or social background; shared culture and traditions that are distinctive, maintained between generations, and lead to a sense of identity and group; and a common language or religious tradition”.*¹⁸⁸

Inferences within studies are limited due to small sample sizes or lack of demographic characteristics leading to students often being categorised as either White or non-White.¹⁸⁹ This can be problematic when analysing differential attainment between ethnic minority students. In some cases, students from particularly under-represented ethnic minorities are excluded from the statistical analysis altogether.¹⁴⁵

It is widely accepted that differential attainment in medicine based on ethnicity exists. Being non-White was found to have a moderate negative effect on academic performance at medical school in a meta-analysis looking at ethnicity and academic performance at both undergraduate and postgraduate levels and was present in 35 of the 36 datasets analysed.¹⁸⁹ Overall, the odds of failing were 2.9 ($p < 0.001$) times higher for a non-White to a White candidate.¹⁸⁹ These findings have been supported by other studies and systematic reviews of undergraduate medical school performance predictors. This could not be explained by prior educational attainment, study habits or clinical experience.^{42,144} There is also evidence that the magnitude of the attainment gap widens during the student's period at medical school in which non-White, male and international medical students experience a relative decline in their academic performance during the course despite controlling for prior educational attainment.¹⁹⁰ This indicates that medical schools and medical education contribute to some of the mechanisms that drive differential attainment.¹⁹⁰ It is important for institutions to reflect and analyse how they contribute to differential attainment in order to develop policies to address this phenomenon.

This differential attainment persists beyond qualification, with students from ethnic minorities at higher risk of failing postgraduate examinations, progressing more slowly through training, even when exam failure is controlled for, and experiencing lower job recruitment rates from foundation training to consultancy.^{191,192} A very concerning finding from a pilot study looking at recruitment

for hospital posts based on sending matching job applications differing only in name and ethnicity found varying interview rates for those from an ethnic minority.¹⁹³

Understanding the causes and drivers of differential attainment has been challenging as they are complex and multifactorial. There is no empirical evidence to support causal models based on learner deficits (lack of ability or academic weakness), and the gap remains despite controlling for pre-university attainment and socioeconomic status, motivation, study habits, stress or significant life events, and personality.^{189,194,195} Neither is there evidence that the attainment gap is simply due to examiner bias, as it is present in human and machine-marked assessments.^{144,146,196} There is a need to consider the impact the learning and social environment have on ethnic minority students and how this impacts academic outcomes.^{191,197} Differential attainment has been viewed through the lens of social and cultural capital. Bourdieu considered that each social class has its own set of skills, knowledge, norms and values, described as habitus, such as the language used, books read or the types of holidays taken.¹⁹⁸ Educational attainment differentials are inevitable if the desirable characteristics and values are set by the privileged in their image. As such, individuals not from those backgrounds start from disadvantaged positions.

“If those that are privileged, and therefore able to amass the most social and cultural capital (and also to set the norms for what forms of capital are valued), are more likely to attain a college degree, then the social hierarchy is effectively reproduced via higher education.”¹⁹⁹

Mountford-Zimdars et al.¹⁹⁵ propose a causal model (see Figure 1-6) that describes the complex interplay of:

- Students’ experiences of learning,
- Their relationships with staff, amongst peers and the institution and the impact that has on their sense of belonging,
- Psycho-social and identity factors, including the beliefs and expectations of the staff and themselves about their ability
- Their access to cultural and social capital.

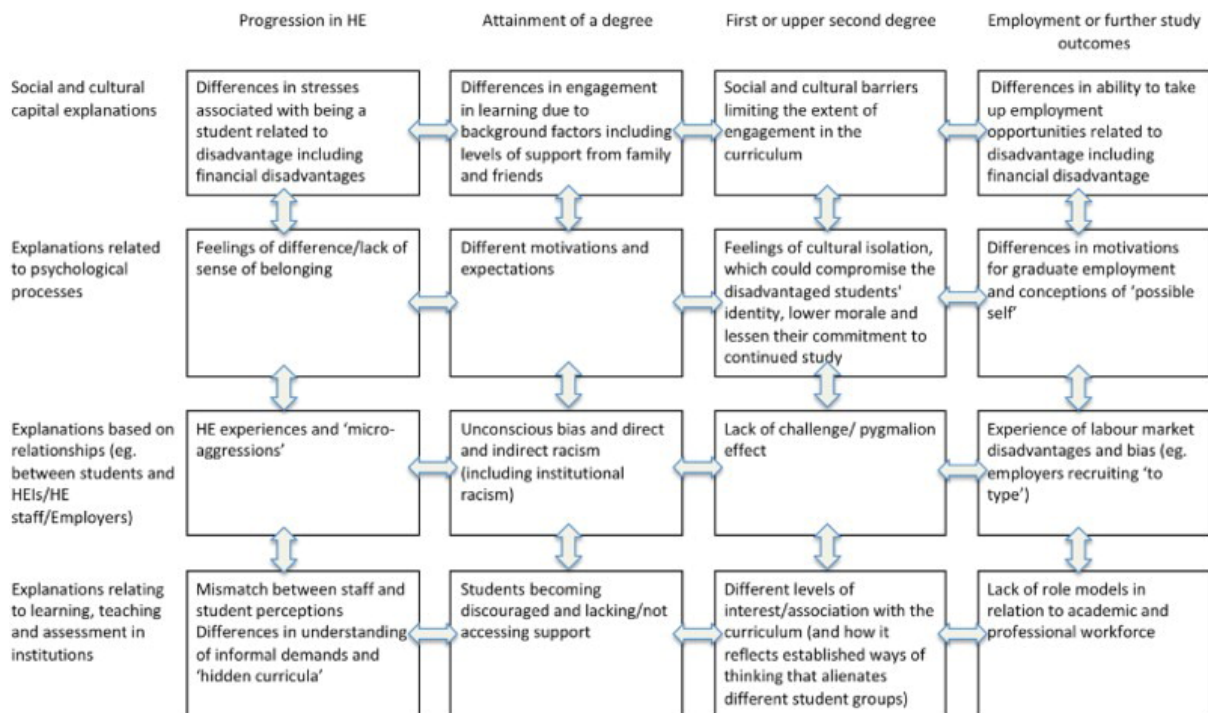


Figure 1-6: The interplay between factors that impact a student's journey through higher education and into future employment (Taken from Mountford-Zimdars et al. 195)

Factors such as difficulties forming relationships with senior doctors, combined with a lack of trust, cultural differences, biased work-based assessments and recruitment processes, and difficulties obtaining support were described in a study looking at the additional challenges faced by ethnic minority UK medical graduates and international medical graduates working in the UK.²⁰⁰

A recent qualitative study into the perceived barriers to the performance of medical students of BME background has supported many of these findings.¹⁸⁶ BME students were aware that medicine is a socialised course and that peer support and social networks were necessary for success, but they found it difficult to fit in with their White peers.¹⁸⁶ They were more likely to socialise with other students from ethnic minority backgrounds; some felt this limited their access to study resources available to their White colleagues. There was also a common theme of feeling isolated, accompanied by a sensation that they didn't belong. This was perpetuated by their experiences with patients and staff members. Overt racism was infrequently reported, but microaggressions appeared common, strengthening the belief of being different and less deserving, impacting their self-confidence and self-efficacy. This led to students masking their identities to avoid negative stereotyping. Finally, there was a lack of trust towards the institution created by unclear procedures for reporting racial incidents and a sense that the difficulties faced

were not well appreciated or understood, reducing the likelihood of students reporting these experiences.¹⁸⁶

Arguments that the intersectionality of social deprivation and ethnicity underlies the ethnic attainment gap appear unfounded. Two papers did not find evidence that differences in socioeconomic status or schooling accounted for the differences in ethnic attainment.^{24,150} Only a few studies have looked into socioeconomic deprivation as a predictor of academic performance and concluded that there is no significant correlation once educational attainment is taken into account.^{37,40} However, this may be due to a small sample size as there is an underrepresentation of students from lower socioeconomic groups in medical school. With a push towards increasing diversity and widening access programmes mentioned earlier, there is a need to monitor for evidence of differential attainment due to socioeconomic background.

1.3.2.4.2 International Medical Students

International medical students (IMS) make up a significant proportion of medical undergraduates worldwide²⁰¹, with evidence of poorer academic performance in both written and OSCE examinations and across preclinical and clinical phases of the course.^{145,202–205} Difficulties with language skills and communication have been cited as contributing factors, although Mann et al. reported poorer results in IMS, even in those who had identified English as their first language.²⁰³ They argue that ‘acculturation’, the process in which foreign students have to overcome additional stressors over and above the traditional challenges of university for home students, such as culture shock, home-sickness, racial discrimination and language barriers, is a more significant predictor of academic performance than language acquisition.²⁰³ This is further supported by another study that showed that the simple acquisition of language skills did not explain the difference in performance between IMS and home students. More specifically identified difficulties with conversational consultation skills.²⁰⁶ There is often an additional financial strain that requires time dedicated to paid work which impacts the time available to study, further reducing the chances of good academic performance in assessments.¹⁸¹

These diverse challenges are combined with lower academic performances, which leads to increased anxiety and stress levels and reduced quality of life.¹⁸¹ This has led to calls to improve financial support whilst nurturing cultural integration and social support through fostering intercultural relations and making local students more aware of the difficulties of their international colleagues.²⁰⁷

1.3.2.4.3 Mature students

Mature students face greater financial stresses requiring paid work and familial responsibilities, which compound the age barrier to socialising amongst their peers.¹⁸⁵ The financial stresses and time constraints can also put pressure on their relationships with partners leading to increased psychological stress and poor mental well-being.¹⁸⁵

Whilst institutions should be aware of the needs of these students, the evidence suggests graduate entry students perform comparably^{208,209} or better^{210–212} than standard entry students at medical school. Life experience and transferable skills from prior careers, a greater commitment to a career in medicine, more developed study methods, and greater workload management skills are some of the reasons theorised for this.^{185,213,214}

1.3.2.4.4 Students with physical and Learning Difficulties and Autism

Recent initiatives to improve the diversity of representation of health professionals with physical and learning disabilities have highlighted a need to ensure that appropriate adjustments and support are available to meet their specific needs.^{215,216} Disability, physical or intellectual, carries a stigma which impacts students from disclosing it and obtaining the available support.²¹⁷ Societal attitudes and medical training have led to medical students associating disability predominantly negatively, although evidence suggests formal disability teaching can remediate this.²¹⁸

Learning disabilities (LD) are a heterogeneous group of disorders, including autism spectrum disorder (ASD), attention-deficit hyperactivity disorder (ADHD), dyspraxia, Tourette's syndrome and intellectual disability that can affect the acquisition and use of a range of abilities, including listening, speaking, reading, writing, reasoning and mathematical skills.²¹⁹ There has been a paradigm shift towards neurodiversity in which differences that incorporate cognitive strengths and challenges are considered, rather than relying on the traditional medical deficit model, which is criticised for exclusively focusing on the impairments and limitations of these 'disorders'.²²⁰

Neurodiversity celebrates some beneficial characteristics that students with autistic traits bring to a medical career, such as excellent attention to detail, good pattern recognition, expertise in a narrow area and a degree of emotional detachment.^{216,221} Students with LDs may have developed coping strategies to circumvent the usual ways we learn. Yet they can be inefficient, and an increasing workload in medical school can lead to their performance reflecting this.²¹⁶

Knowledge has traditionally been the most coveted performance metric in medical education. However, there has been a shift in direction by medical curriculums in line with guidance from regulatory bodies such as the GMC²²² to emphasise the value of communication skills, empathy, teamwork, partnership and, most importantly, patient-centred care. These are some of the most challenging skills to develop for this subset of learners. Difficulties in social communication for students and clinicians with AT can be misinterpreted as poor professionalism, especially for those with no formal diagnosis²²³, due to the interplay between three central neurocognitive characteristics: mindblindness²²⁴ (the inability to pick up on social cues and read between the lines); weak central coherence²²⁵ (having an overtly narrow focus in which the bigger picture or context can be missed) and executive dysfunction²²⁶ (difficulty planning, adapting new information and self-regulating). Learners and clinicians who exhibit these characteristics may be unaware of why their actions and behaviours evoke negative responses from their educators, peers, colleagues and patients, which can be mutually frustrating and lead to a sense of injustice, a loss of self-esteem and motivation for the course.²¹⁶ Simultaneously, if those behaviours are interpreted as rude and offensive, this may leave the recipient, be it a patient or colleague, feeling frustrated, angry, resentful and less likely to empathise or offer support.²¹⁶

1.3.2.4.5 LGBTQ students

Lesbian, gay, bisexual, transgender and queer medical students often feel the need to suppress their sexual and/or gender status at medical school, which has been linked to increased rates of depression and anxiety.^{227,228} Experiences of discriminatory comments and heteronormative biases by physicians and faculty increases the fear of openly identifying as a sexual minority due to fears that this will negatively impact future learning or career opportunities.^{187,228} One study investigating students who identified as a sexual minority found that this fear reduced the likelihood of them developing trusting mentorship relationships with advisors and faculty, which contributed to their sense of isolation.¹⁸⁷ The study also noted the intersectional impact of being non-White whereby the students felt they were already disadvantaged due to their ethnicity and were therefore even less likely to openly identify as LGBTQ due to fears of being doubly discriminated against.¹⁸⁷

1.3.3 Support and Remediation Practices

Remediation is;

“the act of facilitating a correction for trainees who started out on the journey toward becoming a physician but have moved off course”.²²⁹

Whilst most medical students complete the course without needing academic support, as described above, a significant proportion of students exhibit difficulties across a myriad of issues, including; academic underperformance, unprofessional attitudes and/or behaviours and difficulty in applying knowledge to clinical practice.^{136,141,142,230} This cohort of students are not a homogenous group, and this requires institutions to develop policies that address this variation. This has led to remediation practices differing across institutions but remaining centred around providing additional support to students who have failed or are deemed ‘at risk’. However, they have been criticised for being generic and/or lacking in theoretical foundations, limiting their success.²¹

To address what has been described as a ‘piecemeal approach’⁵ to remediation, there have been numerous articles published in attempts to guide and improve practice. This includes several review articles and position papers analysing current practices, producing guidelines, and identifying areas requiring more research at both undergraduate and postgraduate levels.^{5,21,133,231–235} Whilst most of the focus of this section will be on approaches to remediation practices aimed at medical students, relevant areas from the broader higher education remediation literature will be drawn upon when applicable.

1.3.3.1 Competing interests and responsibilities

One central difficulty institutions face when setting up remediation practices is the competing interest of all the stakeholders involved in developing a doctor. There is a need to satisfy the social contract between the medical profession and the society it serves in which medical schools are afforded the autonomy to develop and graduate students who provide safe medical care to society. Medical schools also have to ensure their graduating students meet the standards set by professional governing bodies, and finally, medical schools have to satisfy their responsibilities to the student. The aims and desirable outcomes of remediation across the different stakeholders may not always align, as depicted in Figure 1-7. Situating remediation at the intersection between broader societal, professional and institutional systems and values allows us to analyse these competing interests.⁴

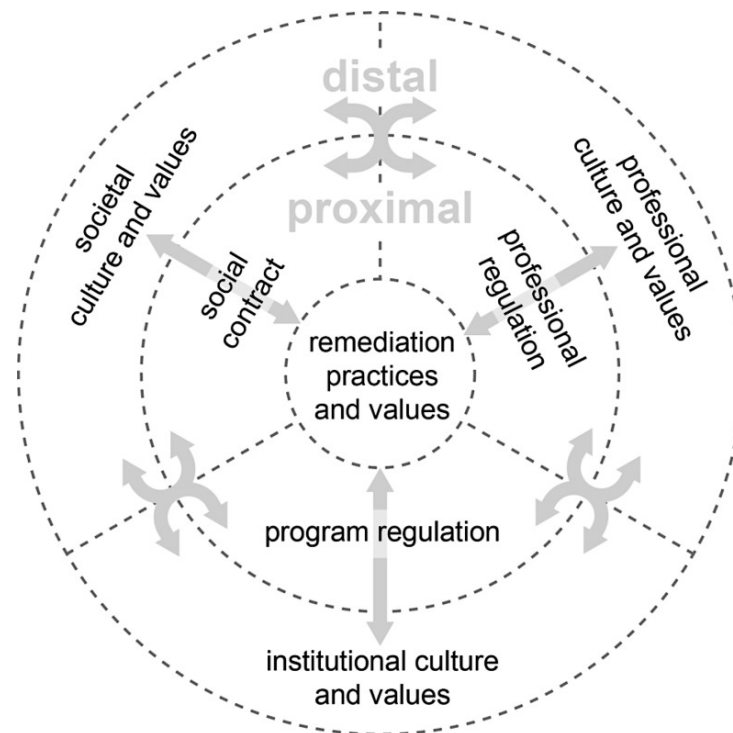


Figure 1-7: Multiple intersecting factors that influence the practice and meaning of remediation. From Kalet et al. *To fail is human: remediating remediation in medical education*. 2017⁴

Social and cultural values differ between regions, let alone countries, and influence how health systems are created and delivered. This impacts what constitutes acceptable and unacceptable standards of practice, which inevitably influences the remediation processes.⁴ Within these systems exists a social contract between society and the medical profession, which provides relative autonomy to the profession to define and maintain the standards of care in return for the production and development of physicians who provide high-quality and safe care.²³⁶ In this contract, there is often the expectation that doctors place the needs of society above their own.²³⁶ Medical schools must ensure their graduating students meet the professional standards of the professions' regulatory bodies.⁷³ However, these regulatory bodies often provide little guidance on how remediation should be provided to support students who fail to meet these standards.⁴ Relative autonomy allows individual institutions to define how to govern, resource and implement their policies.⁴ These policies reflect the institution's core values and mirror how the curriculum and assessments are structured.^{237,238} These values are influenced by the cultural position taken by the institution regarding their beliefs about the causes of student academic difficulty and failure and the extent to what is considered remediable and what is not.⁴ Remediation is often considered at the individual level centred around a deficit model concerning a student's inability to meet the institution's requirements or competencies to progress on the

course.²³³ Commonly, this results in well-intentioned policies that focus on improving performance to meet the standard to pass a re-sit rather than to support the development of lifelong learning skills.²¹ This has led to the criticism that many remediation interventions represent ‘more of the same’ teaching where extra hours are provided to cover prior content.²¹ This assumes a simplified version of failure due to gaps in skills and knowledge rather than more profound seated learning difficulties. Framing failure in this manner ignores the context in which failure occurs and the structural and cultural enablers and constraints at play within the institution and the learner.²³⁹ It also situates remediation as belonging outside the “mainstream” curriculum.^{4,133,239,240} This ignores how normative practices are influenced by the culture and values of the medical school, which inform curricula design and shape the beliefs of both educators and students about support and learning.²⁴¹ Cleland et al. call for educators to consider their assumptions about learning and support as these beliefs shape what a ‘good doctor’ represents.²³⁹ These beliefs influence curricula design, assessment, and the causes of student difficulties and invariably dictate how remediation programs are delivered and their ultimate goal.²³⁹ This has led to calls for a “shift in culture” from considering remediation as individual failure to a more holistic and proactive model in which remediation is integrated and aligned within the institutional and structural aspects of a medical degree programme.²³⁹

Kalet et al. advise educators to consider the impact differing beliefs about competing responsibilities have on shaping remediation.⁴ For example; does the institution’s responsibility to society outweigh its responsibility to the individual student who may be struggling, and therefore ensure students unable to meet the requisite requirements to pass the course do not graduate as they are deemed at risk of causing harm to patients? Or is the failure of the student representative of broader failures of society and the institution that perpetuate the social hierarchy, further strengthening the phenomenon of differential attainment? Furthermore, what are the student’s responsibilities? Finally, the allocation of finite resources to either predominantly help the few who are struggling or the many who are successful reflects the beliefs held about the causes of failure.

1.3.3.2 Practicalities of remediation

Regardless of the beliefs about the causes of student struggles, remediation policies need to exist. We describe the models that exist in the literature that can guide remediation practices, the role educators play in remediation and the difficulties faced when decision regarding removal from the course are required.

1.3.3.2.1 Remediation Models

Several authors have provided models and frameworks to help institutions address the complexities of remediation. For example, a theoretical framework based on the medical model has been described (Figure 1-8) in which the process involves identification of ‘the pedagogical diagnosis’.²⁴² Information is gathered from multiple data sources such as assessments and supervisor reports to identify cognitive (insufficient knowledge/clinical reasoning) and non-cognitive (attitudinal/affective) deficiencies allowing the production of a targeted management plan, that can be re-assessed and adapted at timely intervals.^{233,242,243} The recurrent message from the literature is that for remediation to be effective, the interventions must meet the specific needs of the student.

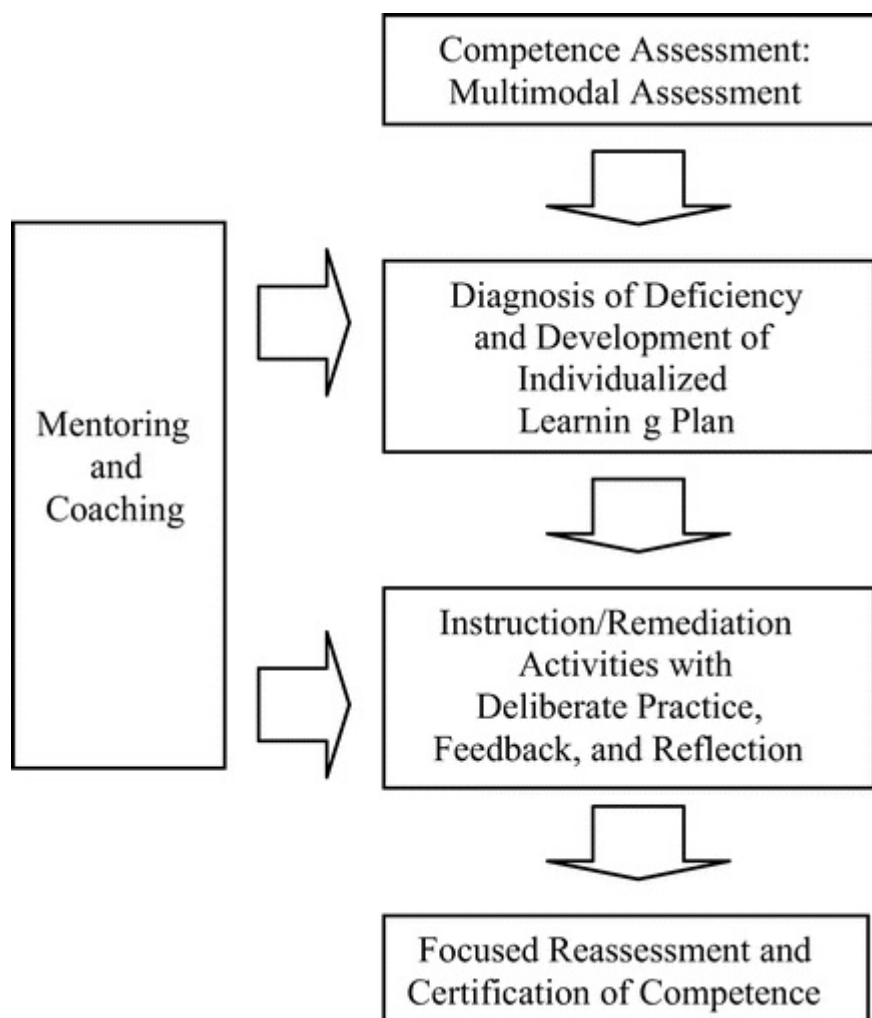


Figure 1-8: Model of remediation of the deficiencies medical trainees (taken from Hauer et al. ²³³)

1.3.3.2.1.1 Step 1 – Identifying the learner in need

A major challenge for educators involved in remediation is timing. The early identification of struggling students is beneficial to stop the “*cycle of underperformance that is characteristic of many struggling students*”.²¹ The later a student is identified, the more exhausted and demotivated they are, which reduces the students’ ability or will to modify their study process.¹³³ However, many of the published remediation articles focused on students in their later years.²¹ Bennion et al. have identified four broad sources to help with the early identification of struggling students: pre-admission and demographic data; self-identification; academic review committees; and the use of multi-sourced, longitudinal performance data.¹³³ Some of these indicators have been previously described, such as preadmission scores, poor performance in early years assessments at medical school, and unprofessional behaviours.^{18,22,25,244–246} Self-identification or self-referral is limited as only a small percentage of students access academic support in this way.²³⁰ Many underperforming students have issues with self-assessment and are often unaware of the need for support until faced with failure, which then comes as a surprise.^{174,247,248} There are also concerns that self-referring students are not necessarily those most in need of help, with a tendency for high achievers to be anxious about their performance and present.¹³³ The associated stigma is another barrier to self-identification and engagement with remediation practices. This is important to overcome as there is good evidence that students who engage with remediation practices can implement sustainable, effective learning strategies with long-term improvements in test-taking over those who choose not to participate.²⁴⁹

Often identification occurs as the result of a missed milestone (failure of an assessment) or from the subjective impressions of an educator.²³⁰ Ideally, multisource feedback should be obtained rather than a single assessment.⁵ At this point, further evidence should be obtained, as underperformance does not provide the diagnosis and should be viewed only as a symptom using the medical analogy.²⁴²

1.3.3.2.1.2 Step 2 – Making the ‘diagnosis’

Non-academic factors, including physical or mental health issues or undiagnosed learning difficulties, may contribute to their poor performance and may act as barriers to successful remediation.^{242,243,245,250} Therefore gathering evidence of such difficulties may help explain “why” the student is facing academic struggle.

As discussed, there is evidence that certain subsections of students, including international medical students, postgraduate students, and underrepresented minority students, face additional challenges during medical school that need to be explored. Discussions with students termed “diagnostic conversations”²⁵¹ or “diagnostic interviews”¹⁵⁴ are important sources of information that may help contextualise the external factors that impact their academic performance and approach to study.^{154,251} These conversations also allow for both parties’ expectations of the remediation process to be made explicit.

However, the time taken to obtain multiple measures of performance must be balanced against the risk of delaying identification and providing support in a timely manner.⁵ Chou et al. recommend making students’ prior academic records available to those involved in remediation to assess performance patterns.⁵ Yet, the idea of sharing students’ academic records is a controversial topic. There are fears that this will further stigmatise students who require support and create biases amongst educators leading to unfair treatment, impeding their right to confidentiality and making institutions more vulnerable to litigation.^{238,252} This argument has merit; a scoping review across a wide range of non-medical settings showed evidence of a negative bias when assessing current performance if prior poor performance was known.²⁵³ The counterargument raises concerns that lack of continuity is a barrier to identifying struggling students early and limits the ability to provide ongoing longitudinal support and student growth.^{254–257} There is no universal approach to sharing students’ academic records; for example, only around half of the medical schools in a study in the US and Canada confirmed they engage in learner handover.²⁵² The type of information shared also varies between institutions, often depending on the perceived severity of the issue.²⁵² Where policymakers and educators sit within this debate is once again influenced by how they view the competing interests of the institution’s responsibility to fulfil its social contract against supporting the student. Proponents of learner handover all recommend that medical schools should institutionalise the practice with the development of policies that clearly outline the circumstances in which student assessment information is shared, that sharing occurs with the student’s knowledge, and is only shared within a limited group of medical school faculty who can support the remediation goals.^{5,254,256}

1.3.3.2.1.3 Step 3 – The management plan

Step three of the medical model involves formulating a management plan to address the deficiencies identified in the “diagnosis”. Learners who face difficulties have multiple challenges and require individualised longitudinal support.^{136,230,233} Learning plans should be created in

discussion with the learner, which makes explicit the learning needs, interventions, assessments and expected outcomes delivered within a specified timeframe which are all documented.^{4,258} Regular assessments and pre-arranged meetings to assess progress with high-quality feedback allow for opportunities to adjust the expected outcomes if and when required.^{5,259,260} The literature favours holistic approaches to remediation that target both cognitive and affective domains of learning, which improve study skills and provides self-regulated learning strategies.^{136,154,259,261}

Addressing remediation in medical education through self-regulated learning (SRL) principles has been promoted strongly.^{5,21,154,174,262,263} Struggling students tend not to engage in SRL, choosing inappropriate learning strategies and using maladaptive coping strategies such as externalising or trivialising failure.^{174,175,264} Teaching SRL skills has been shown to be effective at all levels of education, helping struggling students' academic outcomes and improving their motivation, help-seeking behaviours and the utilisation of learning strategies to optimise their outcomes.^{174,263,265–267} Durning et al.²⁶³ use a simple example to illustrate how this plays out in a student with low self-efficacy/task-specific confidence for taking blood from a patient. The student may show low levels of motivation or avoid clinical experiences in which they may be exposed to practising this skill due to fears of eliciting negative feedback from an educator. The provision of strategic feedback in ways to improve the clinical skill may alter the student's perception of competence and reduce anxiety and thus improve the student's motivation.²⁶³

Whilst SRL is also supported as the mainstay of remediation in cases of professional lapses,⁵ a recent systematic review exploring how to remediate professionalism lapses in doctors and medical students highlighted the lack of evidence available to guide best practice.²³⁴ This is particularly concerning as lapses in professionalism are considered more challenging to remediate and are often the underlying cause of clinical skills and knowledge deficits.^{250,268} Establishing supportive and non-judgmental spaces for guided self-reflective discussions of unprofessional behaviours with experienced professionals can improve insight and prevent future professional breaches in mild to moderate lapses.^{250,269} However, the more serious or recurrent patterns of professional lapses that remain despite remediation efforts should be subject to investigation in line with the expectations of regulatory bodies and may necessitate the dismissal of students from the course.^{270,271}

Individualised learning plans do not mean that the benefits of group remediation sessions should be neglected. Whilst we have argued that each student's context is unique, we have also stated that there are common causes of academic difficulties. Discussions in group sessions between

peers can help learners identify their areas of weakness²⁴⁷ and find shared solutions.^{259,272} Group sessions can help create supportive, psychologically safe spaces where peers can build trusting relationships and a sense of belonging, promoting reflective acceptance of feedback.^{259,273} This sense of belonging may reduce the stigma of appearing weak in a competitive environment that often leads to students withdrawing from their peers and social isolation.^{273,274} However, Patel et al. cautioned against failing students working exclusively together due to the risk of solidifying poor work practices and limiting opportunities to develop more adaptive learning styles.¹⁷⁴ Expert faculty facilitation is required to prevent groupthink and premature closure of discussions, to ask disruptive questions and hold the students accountable for their learning.^{275,276} Winston et al. describe this as “*a cognitive apprenticeship within a small community of enquiry*” that fosters curiosity and joy for learning and motivates and challenges the students.²⁷⁶

Longitudinal programmes are recommended as there is evidence of a dose effect in which students who attend more sessions over a longer period of time produce long-term improvements, but there is no definitive duration advised in the literature.^{259,277–279} Behaviour change and the development of critical thinking take time and regular feedback. Time is also essential in building trusting relationships that allow students to grow in confidence and voice uncertainty in front of their peers and facilitators.^{259,280} The hope is that most students will reach a point where further remediation is no longer required or desired. However, long-term follow-up is recommended to ensure that neither old issues have resurfaced nor new difficulties have arisen. Regardless, a number of students will continue to struggle, and there needs to be a clear cut-off for when remediation has not led to the desired outcome, and a decision about progression on the course needs to be formalised. Not all medical students will or should graduate if the required standards are not met. If failure within remediation processes leads to dismissal, there should be systems in place to provide counselling on potential alternative career pathways and financial support for the debt that may have been incurred through training.^{4,5}

1.3.3.2.2 The role of the educator in remediation

Being an educator involved in remediation is highly demanding, requiring the ability to take on numerous roles; facilitator, nurturing mentor, disciplinarian, diagnostician, and role model of the skills the students require.²⁷⁶ Experienced educators have better long-term outcomes than junior faculty when involved in remediation.²⁷⁶ This has been attributed to experienced teachers being more disciplinarian and more likely to push the students outside their comfort zone.²⁷⁶ In a survey of 134 US medical schools, less than half of the staff involved in remediation had a background of

graduate degrees in education.²⁸¹ Kalet and Zabar state the need to develop faculty on an individual and institutional level.²⁸² There is also a need for educators to develop the ability to judge medical learners' performance across a variety of competencies, develop facilitation skills and cultivate emotional intelligence and courage.²⁸² On an institutional level, there have been calls to produce communities of practice in remediation of highly motivated educators that develop specialised areas of expertise.^{5,7,282} This community of practice can share experiences and support one another, especially when faced with challenging remedial scenarios. However, whilst experienced educators appear to provide optimal remediation, they are also often in more senior positions within medical institutions and are involved in decisions regarding student dismissal. This can be seen as a conflict of interest and a barrier to developing and establishing a trusting relationship with the students, which is key for effective remediation.^{4,5,133} It also risks solidifying students perceived idea of remediation as punitive. This has led to recommendations to separate those involved in remediation and decision makers for course progression or dismissal.^{4,5} Keeping these processes distinct has additional benefits when addressing the phenomenon of 'failing to fail' as it removes assessor bias.

1.3.3.2.3 The phenomenon of 'failure to fail'

Reporting students who face academic or professional difficulties is challenging for educators. Educators find it difficult to balance conflicting roles of teaching and assessing their students. Tutors tend to perceive the relationship with students as professional relationships with potential future colleagues in which reporting underperformance risks negatively impacting that relationship.^{7,258} Giving negative feedback is unpleasant, and it is natural not to want to cause the inevitable immediate negative emotional response from students even when necessary.²⁵⁸ Educators also fear the longer-term fallout of their reporting and associated guilt if the student is dismissed from the course.^{7,258} Guilt can lead to internalising the student's failure as failures of their teaching.^{258,283} In addition, the fear of an appeal and litigation is a significant barrier for many educators as it is time-consuming and raises concerns that their decisions and behaviours will be scrutinised and their credibility questioned.^{7,258,284}

Some educators, especially inexperienced ones, worry about their ability to judge student performance and look to peers as a reference, making them less likely to report a student as underperforming if other assessors score them positively.^{258,283} Cleland et al. observed that tutors found it more difficult to fail students whom colleagues liked and conversely worried about being unfair if they disliked a student.^{258,283} It is also perceived to be easier to fail students who lack

insight and appear unmotivated as they are deemed less safe compared to students who are aware of their difficulties and are making attempts to change.²⁵⁸ As described above, the hesitancy to share information about students' behaviours in other educational contexts is especially challenging when confronting professional lapses as educators attempt to ascertain if these are isolated incidents or form a pattern of behaviours.²⁸⁵

On an institutional level, several barriers limit the reporting of underperformance. The lack of time for educators is a universal issue and impacts decisions to report underperformance in a multitude of ways. There is a lack of time to keep accurate documentation to support dismissal, a lack of time to commit to the appeal process and a lack of time to offer remediation services.^{7,258,283,284} What information to document is also challenging, especially when describing behaviours and issues with professionalism over knowledge gaps.²⁸³⁻²⁸⁵ Some of this is exacerbated by the lack of guidance and support for educators who raise concerns.²⁸⁵ Additionally, many educators are clinicians, and a lack of knowledge of the curriculum leads to a lack of awareness of the expected standards the students should have obtained at different stages of the course.²⁵⁸ Another cited barrier is the lack of remediation options or awareness of what is available to the learner and that what is available is not felt to be effective.^{7,283-285}

1.4 Moving on – Foundation school selection

Selection for foundation jobs following the completion of medical school is a controversial topic and has undergone several changes since its inception in 2005. In the UK, the Modernising Medical Careers (MMC) program noted the need for improvements of what was considered an unsatisfactory system of postgraduate job allocation in line with the conception of the foundation training programmes.²⁸⁶ In 2006-2007, the first national application system was piloted, which ranked applicants based on two metrics; students' academic ranking supplied by the medical school (40%), additional academic achievements, e.g. publications, degrees (10%) and 'white spaced' answers (50%) which assessed the national person specification as evidence of non-academic skills.²⁸⁷ In 2008-2009, the process was deemed unsatisfactory; the UK foundation programme (UKFP) and MSC set up the *Improving Selection to the Foundation Programme* (ISFP) project, which suggested changes from 'white space' questions that were deemed unfair as it was considered labour intensive and stressful for students, it was a costly process (approaching £2million a year in clinician time), there were inadequate safeguards that the answers from

participants were genuine with issues concerning plagiarism (model answers were available online for purchase), and it was criticised for its lack of reliability and validity.²⁸⁷

In 2013 the system was changed to its current format in which the application score consists of the following in a 50:50 split;

- the Educational Performance Measure (EPM) - a score derived from the students ranking at medical school (accounting for a maximum of 43/50 points available), 5 points are available for an additional degree and a further two points for publications.
- the Situational judgment test (SJT) aims to assess commitment to speciality, coping with pressure, effective communication, patient focus and working effectively as part of a team, test students' decision-making ability and manage uncertainty.^{288,289}

In 2023 the EPM will no longer include additional academic achievements such as prizes, publications or prior degrees as this is deemed inequitable as not all applicants have access to the same opportunities. This decision was driven by the findings from a national cohort study by the GMC that showed no evidence of additional predictive validity to the educational achievements in combination with the EPM and SJT in successful completion of the foundation programme.²⁹⁰

Students who qualify from medical schools are required to complete a year of foundation training in the UK before they are fully registered to practice independently by the GMC. Therefore, the UKFP considers the process to be an allocation process rather than a selection process, as all eligible applicants must be placed in a foundation job. The UKFP is tasked with ensuring they employ a fair and equitable system of applicant selection while also ensuring the system protects patients and reassuring employers that foundation doctors are fit for purpose.²⁸⁷

Students apply to their preferred foundation schools and are allocated a place based on their preference alongside the combined score of their EPM, educational attainment and SJT score. In 2020, 70% of students were allocated to their first-choice foundation school and 87% to one of their top five choices.²⁹¹ That leaves a significant proportion (13%) of students allocated to a foundation school outside their top five choices. Applicant choice for foundation school is primarily driven by geographical location, followed by social relationships, including family, partners and friends.^{292,293} The speciality choices within programmes are becoming a lower priority for applicants.^{292,293}

Unsurprisingly students with lower application scores are less likely to be selected for their top foundation school.²⁹⁴ There are current debates about whether the measures included in the application process are fair and equitable.

Proponents of the SJT claim it shows moderate reliability and good levels of incremental validity (adds value in predictive variance in outcome criteria beyond existing tools) and construct validity (evaluates the extent to which the tool measures what it is supposed to be measuring).

Additionally, they are standardised, cost-effective, hard to learn for and easy to deliver to large cohorts, which is necessary for a national selection process.^{288–290,295} However, even the most ardent supporters of the SJT accept that the variance of performance as a doctor is moderate at best.²⁹⁶ SJT scores tend to cluster close to the mean²⁹¹ resulting in small differences in the raw score being extrapolated into large point allocation differences.²⁹⁷ Randomly guessing one question scores on average 1.85 scaled marks, thus, there is a benefit to not leaving any answers unmarked despite not providing evidence of greater competence.⁵⁰ The weighting of the SJT has also been criticised as a maximum score for each question is equivalent to 3 application marks.⁵⁰ In contrast, the maximum difference in the EPM decile marks between students in the top to bottom deciles is only 9 marks (the bottom decile students score 34 points and the top decile score 43), thus any one assessment mark undertaken at medical school accounts for an almost negligible weighting. From the student perspective, the SJT is considered a fairer system than the previous ‘white spaced questions’, but concerns remain about the subjectivity of the assessment and the weighting compared to their prior academic achievements.²⁹⁸

Of the components of the selection process, the EPM decile score is the most predictive of completing foundation training (positive outcome at F2 ARCP), with a 15% increased chance of the doctor completing the training satisfactorily for each decile higher they ranked at medical school.²⁹⁰ A major criticism of the EPM is that decile outcomes do not account for inter-medical school disparities, with some medical schools being more competitive to get into, thus, attracting the top academically performing students on entry, i.e. a student in the top decile of one medical school may have placed in a lower decile at another.^{299,300} This appears to be supported by findings from the MedDifs study that showed a difference in postgraduate exam outcomes depending on the medical school attended, which correlated with the grades required for entry, with schools with higher applicants per place outperforming less competitive ones.³⁰¹ Additionally, the EPM is not standardised, with each medical school given autonomy over which assessments are included in the score and how they are weighted.⁵⁰ In addition, non-White students and students with a known disability are over-represented in the lower deciles and under-represented in the top deciles.¹⁹⁰

Even when controlling for the application scores, ethnic minority students are less likely than their White peers to be selected for their top choice, although there has been no evidence that the selection process discriminates against applicants from lower socioeconomic groups.²⁹⁴

1.5 Aims and Objectives

Several areas of interest became apparent from the above literature, which has influenced the research question and development of the separate components of the thesis.

This thesis aims to investigate the predictors of academic underperformance and explore the experience of students who face academic difficulty regarding their perspective of teaching, assessment, failure and support within BSMS, as well as the impact of the selection process for their future jobs.

Within this thesis academic difficulty/underperformance has been conceptualised as relative underperformance compared to peers. As such, students who placed in the lower three deciles of assessment ranking are used as the outcome variable in the retrospective cohort analysis and as the cut off for recruitment purposes in the IPA study.

Through understanding the personal and institutional contributors to academic performance and failure, we may be able to identify at-risk students earlier and offer mitigation strategies, as well as suggest strategies to make medical schools more equitable spaces.

Objective 1

- To explore the current literature regarding how students make sense of their academic difficulties.

Objective 2

- To investigate whether sociodemographic factors predict academic performance in medical school.

Objective 3

- To identify whether there is any evidence of differential attainment within BSMS and highlight which student groups were most affected.

Objective 4

- To identify whether early assessment scores predict ongoing student academic performance and which assessments have the strongest association.

Objective 5

- To explore the accounts of students' who face academic difficulties regarding their experience of assessment, teaching, learning, and support. To explore whether these accounts can provide new perspectives that can drive change in assessment, supervision, curricula design and selection processes for future cohorts.

The above objectives will be addressed within the thesis and is divided into three parts.

1.5.1 Part 1: A scoping review of the literature

Student struggle has been researched from various angles in medical education literature ranging from social and psychological difficulty to academic failure, but rarely from the perspective of the student who has faced academic difficulty. It is important to explore how medical students make sense of their academic difficulties because their beliefs about the causes of their difficulties influence how they engage with support processes and remediation programs. This led to a scoping review synthesising the relevant literature of the experience of academically struggling students with regard, but not limited to, assessment, curricula design, failure and learning styles at medical school.

1.5.2 Part 2: A retrospective cohort study

A key question that remains challenging from the remediation literature is how to predict students at-risk of academic difficulty early, and ideally before failure of a high stakes-assessment where they face the possibility of repeating years of study or exclusion from the course.

Prior studies have shown that the highest attrition rates from the medical course were in the first (60%) and third year (16%).¹⁷ Attrition in year one has often been attributed to external pressures to read medicine, incorrect motivation for picking the course, academic failure, mental health difficulties, and voluntary withdrawal.^{16,20,302,303} There has been less focus on students who have struggled academically but persisted on the course.

The third year of the medical degree programme appears to be a crucial year in which students have managed to navigate the transition from school leaver to university student and need to

adjust to learning in the clinical environment. At BSMS, it is the year in which students cover the general medical and surgical rotations before moving on to more specialised rotations in year 4. In this year, there is also a shift to learning concepts that need to be applied to the clinical context, which has been noted to be particularly challenging for 'weaker' students.^{135,174}

I, therefore, conducted a retrospective cohort analysis of existing anonymised admission and assessment data held within BSMS databases to investigate the predictors of academic performance by the completion of the third year of the course. The outcome variable acting as a surrogate for academic underperformance is students who placed in the lower three deciles of assessments at the end of year three. The decile score is a combination of multiple, multi-modal assessments, and it has been shown to be predictive of both future academic performance and risk of disciplinary actions once qualified, as well as contributing to the selection process for foundation schools.^{290,304}

1.5.3 Part 3: Qualitative study: How do students make sense of their experiences at medical school and attribute the causes of their academic difficulties?

The final component of the thesis is an exploration of the lived experiences of medical students at BSMS who have completed their third year of the course and placed in the lower three deciles. The aim was to create a narrative of student experiences of the curriculum, learning, assessment, failure, support, socialising, belonging, and the ranking process to learn about how they understand and attribute the causes of their academic difficulty and how this impacts their behaviours. Exploring the student perspective has the potential to provide new insights to improve how the curriculum, assessment and support are delivered.

1.6 Ontological and epistemological perspectives

In conceptualising the research question, I had to reflect on the ontological (statements about the world) and epistemological (statements about our knowledge of the world) stance I believe in. Within the ontology continuum, I sit somewhere between *relativism*, where reality depends on human interpretation and knowledge, and *realism*, in which reality is deemed to exist entirely independent of human ways of knowing and understanding. Pragmatism as an ontology and epistemology claims that there is an objective reality that exists apart from human experience but it can only be encountered through human experience. As such, knowledge and reality are based on beliefs and habits that are socially constructed.³⁰⁵⁻³⁰⁷ When considering how best to answer my research question, ‘*How can we understand academic difficulties amongst undergraduate medical students?*’, I am claiming that the difficulties that medical students who struggle academically face is an objective reality that exists and are influenced by the sociocultural context they exist in, which students, educators and researchers may interpret and explain in distinct ways. By taking a pragmatists position I aim to explore participant’s beliefs about their experiences as this impacts their behaviors which may enable new ways to improve how we teach, assess and support these students.

My background as a medical doctor impacts how I perceive the world. Medicine tends to be based on a realist/positivist worldview in which systemic enquiry to find objective truth through quantitative statistical analysis sits at the peak of the hierarchy of evidence. This implies that ‘truth’ exists independently of consciousness and is awaiting discovery.³⁰⁸ The positivist stance of ‘universal truths/general laws’ that are discoverable purely through objective research does not consider the meaning attributed to that truth. Instead, meaning is influenced by social, cultural, historical and individual experiences not discoverable through quantitative inquiry. In this way, there are “*multiple realities that compete for truth and legitimacy*”.³⁰⁹ In line with what underpins pragmatist epistemology I believe that the ‘participant’s truth’ is specific to them, their backgrounds and their unique experiences.

A pragmatist approach focuses more on generating knowledge to address issues within the field of inquiry rather than philosophical debates about the nature of reality³⁰⁶ and this has impacted how I conceptualised the thesis into its separate components. Taking a positivist stance to investigate whether early assessment and demographic data can help predict ongoing academic performance. The scoping review and broader literature highlight the importance of this to both

students and faculty to allow for targeted support to be provided in a timely fashion. Many of these predictor variables are influenced by the sociocultural background of each student, but the outcome remains a reality that they have to contend with. A statistically data-driven approach does not help us understand the 'why?'. Taking an interpretive stance to investigate how students who have performed at the lower end of academic performance experience the course, assessments, and the impact of ranking and failure. These experiences subsequently influence their behaviours, including how they engage with and utilise formal and informal support. This will help educators move away from a student deficit model regarding the student as problematic and needing support and look at how their context and experience impact their ability to perform. Whilst it is important to consider and address structural influences, especially on marginalised communities, changing structural inequality is challenging and takes time. The risk is that, due to time delays, these changes will not address the current reality the students at risk of academic difficulty face, which may lead to our inability to provide the appropriate and timely support they deserve. Thus taking a pragmatist position allows me to identify ways in which the medical school can identify at-risk students early and draw upon the experiences of students by learning about how they understand and attribute the causes of their academic difficulty, which may provide new insights to improve how the curriculum, assessments and support are delivered.

2 Study 1: Understanding the impact of academic difficulties among medical students: a scoping review

2.1 Introduction

On entering medical school, students have demonstrated their ability to meet demanding academic criteria. Yet many students encounter academic difficulties in which they are unable to meet the academic standards set for preclinical or clinical stages of the course. Attrition rates vary between 5-14%, and more students fail assessments but are supported to continue on the course.^{16–20}

Higher education and medical education research has focused on how best to predict academic outcomes, so as to inform admissions policies. However, it is important to explore how medical students make sense of their academic difficulties, because their beliefs about the causes of their difficulties influence how they engage with support processes and remediation programs. This scoping review synthesises the relevant literature.

Addressing academic difficulties early is important given the correlation between undergraduate underperformance and a greater risk of unprofessional behaviours, disciplinary proceedings, and fitness to practice hearings once qualified.^{22–25} Remediation practices vary across institutions, but typically provide additional support to students who have failed or are deemed to be ‘at risk’ of failure. However, they have been criticised for being generic, lacking in theoretical foundations, and having limited success, as outlined in chapter 1.²¹

This situation could be improved by utilising the broader literature on academic performance and attrition across higher education, which has highlighted the importance of situational, institutional and dispositional factors.^{26,27} These are described in detail in Richardson et al.’s systematic review and meta-analysis.¹³ They analysed the theories underpinning the complex interplay between personality traits, motivational factors, goal setting, effort regulation (ability to maintain effort in the face of challenges), self-efficacy (belief in one’s ability to complete tasks), and use of self-regulated learning (SRL) strategies to explain whether students attribute their academic performance to internal or external factors.³² Student approaches to learning (SAL) models further categorise learning strategies as ‘deep’ if they encompass critical analysis and information synthesis, in comparison to ‘surface’ strategies such as memorisation, or ‘strategic’ strategies whereby students choose which approach to take depending on how they value the task.^{130–132}

Within medical education literature, there has been a specific focus on the academic, psychological, and social/contextual factors outlined below.

2.1.1 Academic Factors

Academic factors prior to medical school have mostly been investigated from the perspective of entry criteria and admissions scoring systems. The largest UK study on this topic identified a predictive link between prior academic achievement, progress through medical school, and performance in professional exams,²² although this has not always been replicated in smaller studies.^{42,56} Nonetheless, using pre-university exam performance to determine academic capacity is problematic, because factors such as social class and gender are determinants of academic outcomes independent of ability.⁴⁵ Furthermore, medical students who attended State schools academically outperform students who attended selective schools, despite similar results in final secondary school exams.¹⁰⁹ Studies assessing the predictive validity of aptitude tests have been inconclusive,^{40,56,57} and none show how they could be used to target support for at-risk students.

Important **academic factors at medical school** include the concepts of SRL and SAL,^{130–132,119,123,138} and the transition from pre-clinical learning to clinical practice. Berkhout et al. highlighted that experienced learners took control of their learning with more focused goals and efficient learning strategies.¹³⁹ The authors of a recent review of research into the transition to learning in the clinical environment cautioned against limiting the conceptualising of “transition” as ‘a maladaptive struggle’, and drew attention to the benefits of reframing it as a positive transformative experience.¹⁴⁰ Others have noted that academic struggles such as poor study habits or inadequate preparation for undergraduate study are more remediable than shortcomings in character, professionalism, or behavioural issues.³¹⁰

2.1.2 Psychological Factors

Studies investigating psychological factors have centred around stress, mental health and support.^{171,172} Research has revealed a high prevalence of distress among newly-qualified doctors, with many medical students experiencing substantial distress even prior to qualification.⁹ Also of concern is the finding that medical students have lower distress scores compared to non-medical students on commencing medical school, but graduate with higher levels of depression and burnout.⁸ This appears to be a global issue,^{176–180} and must not be ignored by Western medical

schools attempting to diversify their student intake: evidence suggests that international medical students experience more psychological distress than home students.¹⁸¹ Recent initiatives to improve the diversity of representation of health professionals with physical and learning disabilities have highlighted a need to ensure that appropriate adjustments and support are available to meet their specific needs.^{215,216}

2.1.3 Social/contextual Factors

Attrition models show that social, academic and institutional integration are strongly linked to course completion, whereas external pressures hamper this.^{116–118} Several studies have focused on the experiences of sub-groups of medical student that are under-represented in wider discussions of academic difficulties. These include mature students, students from ethnic minority backgrounds, LGBTQ+ students, and international students.^{184–187} Widening participation initiatives have been designed to increase the demographic breadth of medical school intakes, but this sub-group of students has higher attrition rates across university courses.³¹¹ Successful widening participation programmes may require appropriate curriculum and support systems to match student needs.^{113,114,312,313}

The scoping review reported here aimed to explore students' experiences of academic difficulties in relation to the various factors identified above.

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2.2 Methods

The primary researcher (DK) designed the scoping review which was conducted following the five stages described by Levac et al.³¹⁴:

1. Identifying the research question – combining a broad research question with a clearly articulated scope of inquiry.
2. Identifying relevant studies- ensuring depth and breadth of available evidence was covered and acknowledging any limitations that occurred due to feasibility issues such as time and resource limitations.

3. Study Selection – utilising a team of researchers (DK, GW and RdV) to ensure a transparent and replicable process is in which the team met to discuss decisions regarding study inclusion and exclusion at the beginning of the scoping process. Two reviewers are encouraged to independently review abstracts and full articles for inclusion and regular meetings should occur to discuss any queries relating to study selection and refine the search criteria when required.
4. Charting the data – the research team should collectively develop the data-charting form to determine which variables to extract. Two members of the team should independently extract the data from the first set of studies and compare whether their approaches are consistent
5. Collating, summarising, and reporting the results – analysis of the data should involve a descriptive numerical summary and a thematic analysis. The implications of the findings for research, policy and practice should be made explicit.

2.2.1 Research question:

What is known about borderline/failing medical students' experience of academic struggle, learning style, teaching and remediation?

2.2.2 Identifying relevant research:

Table 2-1 lists the terms used for searches of MEDLINE, EMBASE, PsycInfo, Web of Science, British Education Index and ERIC databases on 15/12/2019 and re-run on 27/08/2020.

Table 2-1 Search Terms

Database	Search Terms
EMBASE, MEDLINE	<p>Students, medical, undergraduate OR medical undergrad* Or Medical student*</p> <p>AND</p> <p>Studen*adj12 borderline/strugg*/difficult*/distress*/fail*/adversity</p> <p>AND</p> <p>Student* adj9 experience/perception/sens*/feel*/impression/belief*/perspective/opinion*/narrative*/attitude*</p> <p>AND</p> <p>Learning style/learning technique or learning approach or learning method or learning practice OR</p> <p>Student* adj9 remediation/support OR Pastoral care/pastoral counselling OR medical adj3 curricul*/syllabus/program*/teach*</p>
PsycInfo, ERIC	<p>(Medical students or medicine students or students in medicine) OR medical undergraduates</p> <p>AND</p> <p>Borderline student OR struggling students OR difficulties OR failing students OR distress OR adversity</p> <p>AND</p> <p>(Experiences or perception or perceptions or experiences) OR (feelings or emotions or experiences or attitudes) OR (perspective or perception or opinion or experience or attitude) OR (views or opinions or perceptions or beliefs or attitudes or experience) OR (narrative OR sensation)</p> <p>AND</p>

(learning styles and strategies) OR (learning practices OR (learning methods or teaching strategies) OR learning approaches OR Medical curriculum OR medical programs OR syllabus or medical teaching OR Remediation OR student support OR (pastoral care or pastoral counselling)

2.2.3 Study selection:

In line with step 3 of the stages described by Levac et al.³¹⁴ above the articles were independently screened by two reviewers (DK and GW) using the three criteria outlined in Table 2-2. The use of the first criterion (population of interest) was progressively narrowed from all students at title review, to medical students at abstract review, and finally academically struggling students at full text review to ensure that no relevant papers were overlooked at an early stage.

Table 2-2 Screening criteria and inclusion/exclusion criteria

SCREENING CRITERIA

1. Population of interest – Academically struggling medical students
2. Measured student experience
3. About curriculum/teaching/learning/remediation/failure/support

INCLUSION CRITERIA

- Published in English
- Focused on academically struggling medical students (not qualified doctors, nor students or practitioners of other health professions)
- Papers that focused on the medical students' experience of failure, learning, teaching, attrition and support.

EXCLUSION CRITERIA

- Articles without full text
- Articles published in another language
- Opinion pieces
- Systematic reviews or review articles
- Dissertations

Figure 2-1 provides a summary of the selection process. Title review led to the exclusion of 484 articles, and 200 more were excluded at abstract review, leaving 84 papers for full text review. Agreement was reached for seven papers which were included in the review. A third reviewer was provided (RdV) a consensus over the four papers where agreement was not reached. Of these, one met the criteria, so eight articles were included in the review.

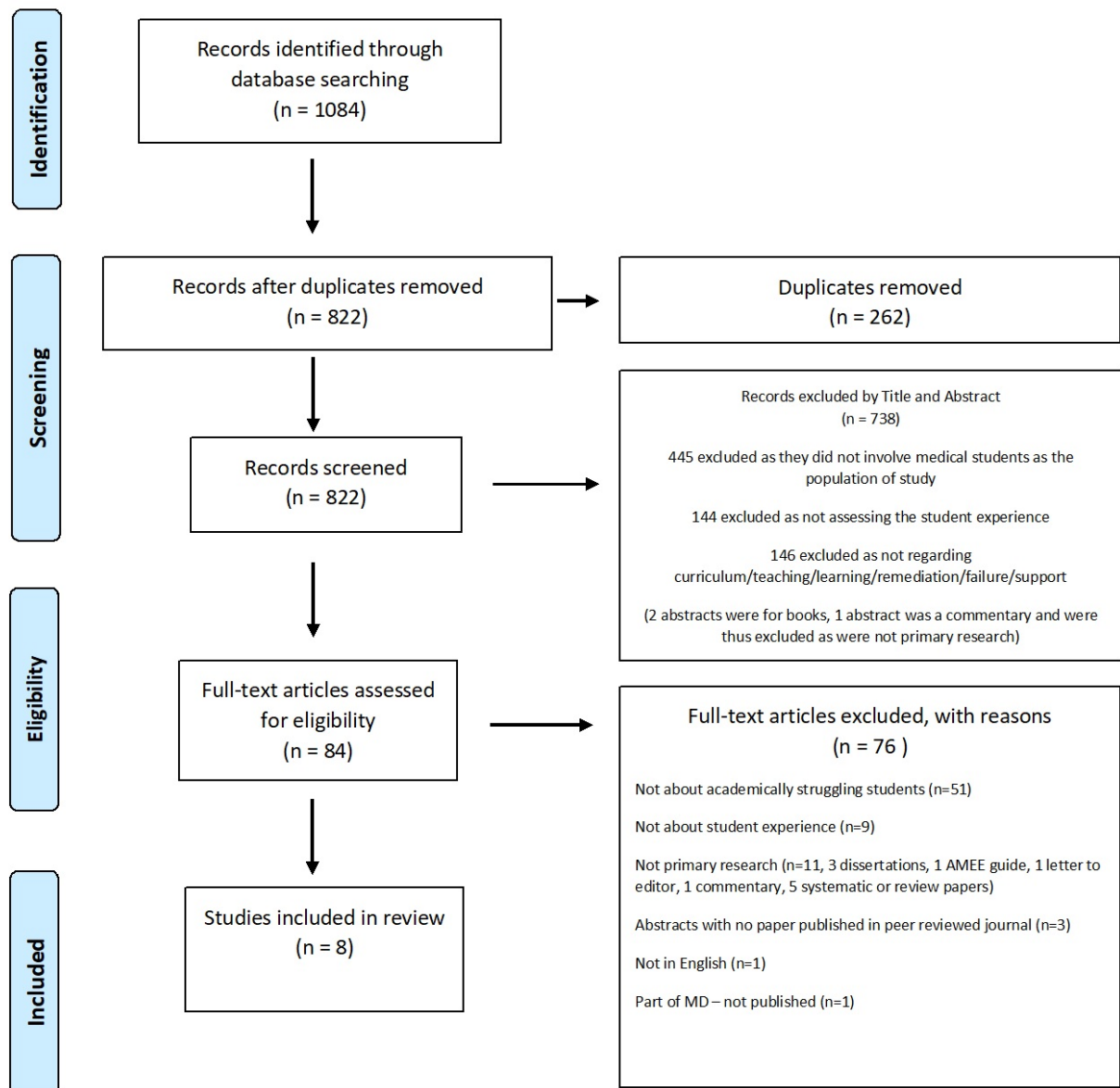


Figure 2-1 PRISMA summary flow diagram indicating the search and selection process

Study quality was assessed using the Mixed Methods Appraisal Tool (MMAT). The MMAT is a critical appraisal tool that permits appraisal of mixed study reviews that include qualitative, quantitative and mixed methods studies.³¹⁵ This includes two screening questions to ensure the tool is appropriate to use for the paper being appraised, this is followed by five quality criteria

specific to the study methodology. It is discouraged to use an overall score from the ratings of each criterion but to consider the quality of the study by contrasting their results.³¹⁵ There was consensus across all eight studies between reviewers DK and GW; six were deemed high quality studies,^{173–175,276,316,317} two were low quality.^{260,318}

2.2.4 Data Extraction:

I developed a data extraction form which was discussed and reviewed with the research team and included:

- Study demographics – the authors, year of publication, journal the article was published in, the study design and the country in which the study took place,
- Participant characteristics – the medical student year of study, sample size, the participant demographic characteristics and the participation selection process,
- Data collection – the data collection methods used (interview/focus group/questionnaire), data analysis methods and what software was utilised for the analysis,
- Conceptual characteristics - definition of academic struggle, what student experiences were explored,
- Results - the identified themes and recommendations of the studies
- Quality control – the limitations of the studies, MMAT for assessment of quality of the studies.

The co-researchers (GW) reviewed the full text articles against the data extraction to check for completeness and any discrepancies. This was an iterative process refined through discussion between the research team.

2.2.5 Collating, summarising and reporting results:

Thematic analysis was conducted using Braun and Clarke's 6-step approach : familiarisation with data; generating initial codes; searching for themes; reviewing themes; defining and naming themes; writing up analysis.³¹⁹ The first two authors independently reviewed the articles to generate initial codes which were then discussed to produce emergent themes. These were reviewed and refined via discussion with the third author.

2.3 Results

2.3.1 Descriptive analysis

Eight studies published between 2002 and 2016 were included in the review (see Table 2-3): four from the UK,^{173-175,260} and one each from Ireland,³¹⁷ South Africa,³¹⁸ Dominica,²⁷⁶ and Pakistan.³¹⁶ One paper focused on first years,²⁷⁶ one on resitting second years,³¹⁸ and two on final year students.^{173,174} One paper looked across all year groups,³¹⁶ one at second to fourth years,³¹⁷ and two at fourth and fifth years.^{175,260}

Five studies used qualitative approaches;^{173-175,260,318} three used mixed-methods.^{276,316,317} Six studies used semi-structured interviews,^{173-175,260,276,317} of which one had an accompanying focus group,¹⁷⁴ one had a survey,²⁷⁶ and one had an evaluation questionnaire.²⁶⁰ The quantitative studies used an open survey,³¹⁸ or self-report scales.³¹⁶ Academic difficulty was defined in varied ways. Two studies used scoring systems as a descriptor of academic underperformance: the distance from the year average in continuous progress tests,³¹⁷ or absolute test scores.³¹⁶ Other defined academic difficulty in terms of failure of summative exams in the final year,^{173,174} or in earlier years.^{175,260,318} One study focused on failure of first semester exams, which automatically triggered student participation in remediation programmes.²⁷⁶

The studies focused on a broad range of student experiences, including motivation,^{175,260} type of curriculum,³¹⁸ learning habits,^{173,175,260,318} assessment modalities,^{173,174,260,317} and support/remediation.^{173-175,260,276,317} One study focused primarily on the interaction between stress and academic outcome,³¹⁶ and one focused on students' perceptions of the influence of teachers on their learning.²⁷⁶

There were diverse approaches to the topic of student experiences. Most had a narrow focus on the effect of specific issues related to student learning and academic outcomes, such as curricular change,³¹⁸ remediation programs,²⁶⁰ the impact of progress tests,³¹⁷ the role of teachers,²⁷⁶ or stress.³¹⁶ Patel's group took a more open and iterative approach in which the experiences explored were defined through semi-structured interviews and student narratives.^{173,174} Todres et al. took a similar approach, but compared high- and low-achieving students to identify differences in SAL.¹⁷⁵

Table 2-3: Study characteristics of the studies included in the scoping review.

Author, Year, country	Title	Study Design	Participant characteristics	Data collection/analysis	Definition of academic struggle	Experience(s) explored
<p>Given, K et al.³¹⁷.</p> <p>2016,</p> <p>Ireland</p>	<p>Red, yellow and green: What does it mean? How the progress test informs and supports student progress</p>	<p>Mixed methods - (Retrospective cohort analysis and semi structured interviews)</p>	<p>Quantitative: 272 participants across all four years at medical school</p> <p>Qualitative: 11 participants</p> <p>2nd year = 2 3rd year = 4 4th year = 3 Interns = 2</p> <p>EU = 8 Non EU = 3</p>	<p>Quantitative: Existing databases. Descriptive statistics and Cohen's d measure of effect size.</p> <p>Qualitative: 11 one-to-one, semi-structured interviews, audio recorded and analysed using thematic analysis</p>	<p>Performance relative to peers in progress tests as defined by Z score as either borderline ($Z < -2 > -1.5$), or unsatisfactory ($Z < 2$).</p>	<ul style="list-style-type: none"> • Formative assessment (in the form of progress tests) • Support • Feedback

			No academic difficulties = 8 Academic difficulties = 3			
McLean, M. ³¹⁸ 2004 South Africa	A comparison of students who chose a traditional or a problem-based learning curriculum after failing year 2 in the traditional curriculum: a unique case study at the Nelson R. Mandela School of Medicine.	Case study - Open ended survey	20 Year 2 students (6 remained on the traditional curriculum, 14 on PBL)	Survey of students who failed year 2	Failure of a summative assessment in year 2	<ul style="list-style-type: none"> • Curriculum • Learning
Patel, R. S. et al. ¹⁷³ . 2015 UK	Medical students' personal experience of high-stakes failure: case studies using interpretative phenomenological analysis	Qualitative - IPA	3 final year students Female = 2 Male = 1 Undergraduate = 1 Postgraduate = 2	Semi-structured narrative interviews	Failure of final year – requiring remediation	<ul style="list-style-type: none"> • Assessment • Failure • Support/remediation

<p>Patel, R. et al.¹⁷⁴</p> <p>2015</p> <p>UK</p>	<p>The struggling student: a thematic analysis from the self-regulated learning perspective</p>	<p>Qualitative</p>	<p>55 students between years 1-5.</p> <p>Female = 20</p> <p>Male = 35</p> <p>UK = 39</p> <p>Non-UK = 16</p> <p>Undergraduate = 44</p> <p>Postgraduate = 11</p> <p>1st year = 7</p> <p>2nd year = 14</p> <p>3rd year = 13</p> <p>4th Year = 11</p> <p>5th year = 10</p>	<p>Semi-structured interview and focus groups</p>	<p>Failure at end of year exams or re-sits</p>	<ul style="list-style-type: none"> • Assessment • Learning • Learning environment • Failure • Medical schools' response to failure • Support
<p>Sajid, A. et al.³¹⁶</p>	<p>Stress in medical undergraduates; its</p>	<p>Mixed methods</p>	<p>470 participants from years 1-5.</p> <p>465 = Pakistani nationals</p>	<p>Perceived stress scale (PSS14), Questionnaire</p>	<p>Low achievers scored <50% in</p>	<ul style="list-style-type: none"> • Mental wellbeing (stress) • Teaching • Assessment

2015 Pakistan	association with academic performance		5 = foreign 1 st year = 115 2 nd year = 110 3 rd year = 85 4 th year = 85 5 th year = 72		end of year assessment	<ul style="list-style-type: none"> • Performance • Academic environment • Support (informal)
Sayer, M. et al. ²⁶⁰	Support for students with academic difficulties	Qualitative – observational study	24 students 4 th year = 15 5 th year = 6 Resit post failed finals = 3	Unstructured conversation, semi-structured interview and questionnaire	Students in remediation or identified by poor performance in summative or continuous assessment	<ul style="list-style-type: none"> • Motivation • Teaching • Learning • Curriculum • Assessment • Support/remediation
Todres, M. et al. ¹⁷⁵ 2012 UK	Medical student's perceptions of the factors influencing their academic performance: an exploratory interview study with high-	Qualitative	18 students 5 th year = 8 resitting students 4 th year = 10 high achievers	Semi-structured interview	Failure in final year requiring students to repeat the year	<ul style="list-style-type: none"> • Motivation • Learning • Academic environment • Performance • Support

	achieving and re-sitting medical students					
Winston K, A et al. ²⁷⁶ 2012 Dominica	The role of the teacher in remediating at-risk medical students	Mixed methods	188 students in semesters 2-10 of the course. 4 teachers	Survey using Likert scale and open spaced answers of experience. Questionnaire and semi-structured interview of educators.	All students had failed semester one and had completed a remediation course.	<ul style="list-style-type: none"> • Teaching (impact of educator) • Learning • Support/remediation

2.3.2 Thematic analysis

2.3.2.1 Theme 1: Identity preservation

Academic difficulties affected students' identities and ideas of self-worth, which in turn influenced high stress levels and impaired mental health. Failure forced some students to confront their self-perception as academically successful students, and this was associated with a fear of being seen as a failure by themselves and/or fellow students.¹⁷³ In attempts to protect against this, there was a tendency to adopt maladaptive coping strategies including misattributing and trivialising failure.¹⁷⁴

Withdrawal from their peers was common due to fears of being marginalised and not wanting to appear 'weak' in an environment perceived as competitive and hostile.^{174,316} In addition, students wanted to avoid being 'noticed' by the medical school,¹⁷⁴ and labelled as 'bad',¹⁷³ and so would not seek early support. These became barriers to changing their learning styles and approaches to assessment.¹⁷⁴ This inability or reluctance to self-analyse was further highlighted as a significant difference between 'high' and 'low' achieving students¹⁷⁵, with the latter unable to adapt their study styles, believing that effort alone would be rewarded with passing.

Interestingly, some students found that being interviewed for the studies provided an opportunity for self-reflection and behaviour change.¹⁷⁵ Other students were resistant to self-reflection even when confronted with failure: this group provides a greater challenge to remediation as they have a greater tendency to externalise the factors responsible for underachievement. Limitations to students' willingness or ability to self-reflect or self-regulate encompassed many of the above issues, and were reflected in the passive narrative that many struggling students used when describing their experiences.^{174,175}

Aspects of students' motives for studying medicine were also linked to issues of identity: 'high' achievers were motivated to study to develop their skills in preparation for their future role as a doctor, whereas 'low' achievers tended to be assessment-oriented, and more fixed in their identity as a student.¹⁷⁵

2.3.2.2 Theme 2: Medical schools' dual roles

Exploration of why students did not seek support through formal institutional processes revealed a recurring theme of distrust of the medical school and the relationship the students had with those placed to support them.

The school was often seen as both 'judge and jury',¹⁷³ positioned as gatekeeper to a successful career in medicine, yet also an intended source of support for the individual student to achieve their goal of becoming a doctor. Many students felt that the approach taken by the medical school was punitive and that remediation came too late, alongside the harmful effects of failing a significant exam.^{173,174,260} Students often used phrases such as 'frustration', 'bitterness', 'feeling let down', 'secondary prevention', and 'too little too late'.^{173,174,260}

Key attributes the students felt a good educator should possess were encouragement, motivation, honesty, and approachability, but also holding students accountable for their learning.²⁷⁶ A sub-theme linked to the role the medical school played in student experiences was the use and nature of feedback. In general, feedback was described as too generic to meet the needs of individual students.^{174,317} Feedback can be a useful tool to improve learning.^{320,321} However, if the delivery of feedback is poor, then it may be perceived as an unsupportive tick-box exercise that does not enhance student's self-esteem or confidence.^{174,317}

Another factor highlighted was the influence on students' study behaviours of the 'hidden' curriculum - the unspoken, implicit values, behaviours and norms that exist in the education setting,^{174,175,318} and the need for medical educators to have a good understanding of group study dynamics and methods.

2.3.2.3 Theme 3: Coping strategies and external pressures

The final theme related to how students cope with failure and their engagement with sources of support. Social isolation was not only a result of efforts to preserve self-identity, but also represented a lack of access to support - especially for graduate entrants, students transferring from other degree programmes, and international students.^{173,175}

Students found it easier to approach peers than personal tutors.^{174,175} However, Patel et al. cautioned against failing students working exclusively together, due to the risk of solidifying poor work practices and limiting opportunities to develop more adaptive learning styles: they called for the use of mentor schemes, alongside improving SRL, to combat this.¹⁷⁴

Availability of time for study may be affected by financial hardship (necessitating the need for paid work), bereavement, relationship breakdown, mental health difficulties and subsequent treatment.^{173,175,260} Although personal problems are not unique to failing students, the difference in the way the students responded to them was pronounced. High achievers tended to use these challenges as motivators to focus their studies and succeed, whereas low achievers attributed their failure to such challenges.¹⁷⁵ To compound this, students' belief that their medical school would not consider personal problems a legitimate reason for failure resulted in delayed help-seeking.¹⁷³

2.4 Discussion

The causes of student academic underperformance and failure are complex, varied and individual. This is why it is important for institutions to understand how students explain and respond to academic difficulties when creating policies to support them.

Predicting which students are likely to face academic difficulty remains challenging, especially as institutions attempt to diversify their intakes. The data presented here suggest that medical schools may need to consider evaluating students' abilities to self-reflect and self-regulate as part of the admissions process. These are essential skills for lifelong learning, and they should be integrated much earlier in students' educational journeys.^{265,322}

However, many of the influences on academic difficulties arise during students' time at medical school: they cannot be predicted through admissions processes, and require support processes able to mitigate their effects. Institutions must act in ways that acknowledge that the ability to meet demanding academic entry requirements does not protect students from academic difficulties, and that for many students this will be their first experience of such difficulties. This can have profound impacts on identity, and act as a barrier to accessing formal or informal support. It may help students if medical schools explicitly addressed the issue, explaining to students that such difficulties are not unusual. Sessions designed to help students develop practical and psychological skills may create an environment in which students are less fearful of being stigmatised and more open to addressing their needs.

For students who do require more support, institutions should be encouraged to aim for individualised remediation, but note that this may be resource-intensive.²⁶⁰ Finding the allocated time within the curriculum and the staff members to provide this level of support may not be feasible for many institutions. Therefore, support should be aimed at addressing the strongest

modifiable correlates of tertiary academic performance: past research has identified a complex mix of self-efficacy, effort regulation, goal setting and integration.^{32,127}

Some students felt that remediation opportunities occurred too late.³¹⁷ This may be prevented via formative assessments and predictive assessment models to enable earlier identification of at-risk students.³¹⁷ Further research to assess whether early identification is feasible at an institutional, multi-institutional and national scale is required. However, institutions should note that students deemed these more useful to the institution than their learning, and often interpreted them as the medical school 'policing' them. Additionally, there is some concern that data-driven approaches to learning risk simplifying the complex nuances of human processes and ignoring social contextual factors.⁶⁹ Transparency regarding the reasons for these procedures, and better individual feedback mechanisms within this testing may help students to recognise the value of formative assessments. Research into students' perspectives on formative assessment and actionable feedback may improve how these tests are applied and improve engagement.

For many students in the studies reviewed here, discussions with the researchers was the first opportunity to reflect on their experiences and learning, and many reported that it was therapeutic.^{173,175} Utilising this, institutions could integrate sessions that encourage students to reflect and challenge their current approaches to learning, facilitated by trained educators capable of teaching SRL strategies.^{119,323,324} This could boost self-efficacy, and thereby help students to cope better with personal problems.^{173,263}

Finally, to address the preference of students to seek support among their peers it is worth exploring whether the benefits of near-peer teaching involving senior students teaching and mentoring more junior colleagues translates to near-peer support.³²⁵ This might appeal to failing students who are reluctant to use formal support pathways due to fears of institutional surveillance and punitive consequences. This may be of particular benefit to traditionally underrepresented students who struggle to integrate,³²⁶ but this is an area that requires more research.

2.5 Limitations and opportunities

Although this review sampled articles across a wide range of institutions and considered differing cultural perspectives to learning and education, it did not include non-English language articles. This potentially excluded relevant studies from other countries in which struggling students may be conceptualised differently and/or where different remediation practices are employed.

Additional databases could have been included, but they were unlikely to have yielded more studies given the focus on medical undergraduates and the unique demands of the course, but parallels could be drawn by examining literature in other healthcare courses. This scoping review only found a handful of studies of the experiences of academically struggling medical students: there is a clear need for more research. Struggling students were generally identified after having failed an examination, but this may not be the only marker of academic difficulties. Future quantitative and qualitative research focused on students in the lower quartiles of exam results – but who still pass – could reveal how widespread these issues are.

Future research to determine the predictive validity of assessment of approaches to learning and formative assessments may reveal better ways to identify students who would benefit from early remediation. This may prompt personal tutors to open discussions to explore students' experiences, and to identify areas of support that may allow for earlier remediation.

2.6 Literature published since the scoping review

The search was re-run on 09/02/2023 to capture any literature published since the scoping review's publication. The same search terms and databases were used. Two hundred ninety-seven articles were identified from the search, of which four met the inclusion criteria; two from Australia and New Zealand,^{327,328} one from the UK³²⁹ and one from Malaysia.³³⁰ The population of interest were first years in one study,³²⁹ first and second years in another³³⁰ whilst one study looked across all year groups³²⁶ and one did not specify.³²⁵ All four studies used qualitative approaches; one conducted unstructured interviews,³²⁹ two used semi-structured interviews,^{328,330} one did not clarify the interview structure³²⁷ and one used additional reflective diary entries.³³⁰ Academic difficulty was defined as failure in any assessment/module or year,³²⁸ failure to progress^{327,329} and scoring in the lowest decile of end-of-year assessment scores in a comparison study with students who achieved scores in the top decile.³³⁰

The findings from these studies strengthen those described in the scoping review. Academic difficulties were described as unfamiliar and negative experiences that were challenging to manage.^{327–329} The stigma of failure and the need for remediation led to withdrawal from family support and peers^{327–330} in a learning environment once again described as competitive and unwelcoming.^{328,329} Difficulties adapting to self-directed learning,^{327,329} managing the workload,^{328,330} and lacking intrinsic motivation^{329,330} were reiterated in these studies.

A lack of trust in the medical school³²⁸ was once again noted to be a barrier to students accessing support, as was the tendency to seek help from peers who had shared similar experiences.^{327,328}

Whilst there is a risk of students working exclusively with peers who have faced academic difficulty due to the risk of solidifying poor work habits,¹⁷⁴ peer support was recognised as a source of strength that improved resilience and student motivation to persist on the course.³²⁸

Recurring factors cited to be contributing to academic difficulty were; mental and physical health difficulties³²⁷⁻³²⁹ family commitments^{328,329} financial difficulties³²⁸ and external life events,³²⁹ such as bereavement. One study that focused on the experience of Maori and Pacific students highlighted the role prejudice, discrimination, and a language barrier had on learning.³²⁶

3 Methods

3.1 Study 2: The predictive validity of early assessment data: A retrospective cohort study

Findings from the scoping review and broader literature regarding academic performance have recognized the need to identify students at risk of ongoing academic difficulty early.^{5,21,133,274}

The overall aim of this study is to identify predictors of academic underperformance.

3.1.1 Objectives:

- To investigate whether sociodemographic, and/or entry criteria predict success at medical school
- To identify which assessments predict ongoing student academic underperformance
- To inform the qualitative exploration of the student narrative around medical school experience of teaching and learning in academically struggling students.

3.1.2 Study Design

We designed and undertook a single-center, retrospective cohort study conducted over a 24-month period between May 2020 – May 2022. Requests for access to already existing anonymized (student identification by student number) admission and assessment data held within Brighton and Sussex Medical School (BSMS) and University of Brighton (UoB) were made once ethical approval had been granted in July 2020.

3.1.3 Ethical considerations

The study was approved by the Research Governance and Ethics Committee (RGEC) at BSMS, reference ER/BSMS9H3Z/1 (Appendix B). The study was conducted in adherence to Good Clinical Practice in research.

Students had not provided prior consent to use their data for research purposes and it would not have been feasible to gain consent without the researcher being able to identify the students. After discussions with RGEC and the head of data compliance and records management at the

UoB access to the data was acceptable as a 'task in the public interest' and badged as a component of an internal BSMS management performance monitoring task. Data were linked to results via student number to avoid identification. To avoid student identification via triangulation in small sub-group analysis we used rounding methodology as advocated by the Higher Education Statistics Agency (HESA) who are the designated data body for England including:

- Percentages are not published if they are fractions of a small group of people
- Averages based on 7 or fewer individuals are suppressed

3.1.4 Eligibility Criteria

3.1.4.1 Inclusion criteria:

- All medical students who enrolled on the medical course at BSMS between 2013 and 2017.
 - This time frame was selected due to lack of available data and significant curriculum changes prior to 2013 and students who enrolled after 2017/2018 had not completed all the years on the course at the time of data collection.
- Medical students who had completed years 1-3 of the medical course.

3.1.4.2 Exclusion criteria:

- Student data for cohorts who have yet to complete three years of assessments and thus have not received a decile score.
- Students who have failed and were no longer able to continue on the course as of the end of third year assessments.

3.1.5 Variables

3.1.5.1 Outcome Variable:

Academic struggle was defined as those students who placed in the lower three deciles of assessment ranking at the end of the third-year exams.

The decile score at the end of the third-year assessment was used to define academic difficulty because it encompasses multiple, multimodal assessments across a number of years. Some authors have defined students who face academic difficulty as those who have failed a summative end-of-year assessment^{173–175,260,318} or absolute test scores.³¹⁶ End-of-year progress assessments are a component of the decile score (see below), and as such, students who failed these would be

included regardless of their decile score and thus, we would be capturing a greater proportion of students who may not have failed any assessments but are performing poorly academically relative to their peers.

The decile score that only included assessment scores from year three was used rather than the composite decile score, which includes scores between years one to three. This enabled us to investigate whether early assessment scores predicted future performance and identify the assessments that held the greatest predictive value.

The focus of the study was to identify early predictors of academic difficulty, therefore, assessment scores in years four and five were not included in the analysis.

The decile calculation changed after 2015/2016. For students that enrolled prior to 2015/2016, the decile score was calculated as such:

Year 1	Weighted at 40%	101 – Family Study % and OSCE %, 102, 103 and 104 Knowledge Test (KT) %
Year 2		201 – Patient Study % and OSCE %, 202, 203 and 204 KT %
Year 3	Weighted at 60%	302 – overall %, Year 3 Integrated KT %, Year 3 Integrated OSCE %
Year 4		404 overall module %, Year 4 Integrated KT % and Year 4 Integrated OSCE %

For example: Student A

	Written Assessment Scores	Practical Assessment scores
Year 1	120 (A)	60 (E)
Year 2	110 (B)	70 (F)
Year 3	130 (C)	70 (G)
Year 4	110 (D)	75 (H)

Overall Year 1 & 2 @ 40%	92 (A+B x 0.4)	52 (E+F x 0.4)
Overall Year 3 & 4 @ 60%	144 (C+D x 0.6)	87 (G+H x 0.6)
Total	236 (X)	139 (Y)
Final Ranking Score	187.5 (X+Y / 2)	

For students who enrolled from 2015/2016 onwards:

	Weighting	Assessments
Year 1		Year 1 assessments will no longer be included in ranking calculation
Year 2	30%	201 – Patient Study % and OSCE %, 202, 203 and 204 KT %
Year 3	35%	302 – overall %, Year 3 Integrated KT %, Year 3 Integrated OSCE %
Year 4	35%	404 overall module %, Year 4 Integrated KT % and Year 4 Integrated OSCE %

For Example: Student B

	Total Written Assessment Scores	Total Practical Assessment scores
Year 2	115 (A)	72 (D)
Year 3	134 (B)	70 (E)
Year 4	102(C)	75 (F)

Overall Year 2 @ 30%	35 (A x 0.3)	22 (D x 0.3)
Overall Year 3 @ 35%	47 (B x 0.35)	25 (E x 0.35)
Overall Year 4 @ 35%	36 (C x 0.35)	26 (F x 0.35)
Total	118 (X)	73 (Y)
Final Ranking Score	96 (X+Y / 2)	

3.1.5.2 Demographic variables:

Commonly obtained measures associated with academic performance were collected, including; age, gender and ethnicity. Gender was subdivided into male and female, with no historical data entry options for trans or non-binary. Ethnicity was divided into five categories described below. Students with disabilities such as learning disabilities or mental health difficulties face additional challenges that can impact academic performance; therefore, this variable was also included in the analysis.^{8,9,216,223} The entry pathway through which students entered medical school was also analysed to investigate any evidence of differential attainment based on this, as prior evidence has suggested that postgraduate students outperform their peers and that students from non-traditional entry pathways are at higher risk of poor academic performance.^{210,212} Disability was sub-classified into four categories grouped by type of disability, as seen in Table 3-1.

These variables were obtained from demographic data collection at enrolment via the admissions department at UoB. Data including pre-admission educational attainment, aptitude test scores, multiple mini-interview scores, socioeconomic demographics or involvement in widening participation initiatives were not available for analysis.

Table 3-1 Demographic Variables

<u>Variable Name</u>	<u>Type of variable</u>	<u>Category</u>	<u>Dichotomised</u>
Gender	Categorical – Nominal	<ul style="list-style-type: none"> • Female • Male 	
Ethnicity	Categorical – Nominal	<ul style="list-style-type: none"> • White (includes White British or White other) • South Asian (includes Asian or Asian British from Indian, Bangladeshi, Pakistani and mixed Asian heritage) • Black (includes; Black or Black British – African or Caribbean or Mixed heritage) • Chinese or other Asian background • Arab • Other ethnic minorities or those who chose not to disclose 	<p>White = 0</p> <p>All other ethnic backgrounds = 1</p>
Disability	Categorical – Nominal	<ul style="list-style-type: none"> • No disabilities • Learning disabilities (includes Dyslexia/Autism spectrum/Asperger’s) • Sensory disability (includes hard of hearing/deaf/partially sighted/blind) • Mental health difficulties • Other (includes unseen/multiple disabilities and those coded as other disabilities) 	<p>No Disabilities = 0</p> <p>Any disability disclosed = 1</p>

Qualification on entry	Categorical – Nominal	<ul style="list-style-type: none"> • A-Levels • IB • Postgraduate (includes UK Masters degree/UK first degree with honours/UK ordinary ((non-honours)) • ACCESS course • Other (includes Diploma of Higher Education (DipHE), Diploma/Foundation degree/Mature student admitted on basis of previous experience/undergraduate credits/PGCert in Education/Level 3 qualifications all subject to UCAS Tariff/Level 3 qualifications some subject to UCAS Tariff/Level 3 qualification none subject to UCAS tariff/other qualification level not known) • Non-UK degree (includes Non-UK first degree/Non-UK doctorate degree/Non-UK Masters degree) 	<p>A-Level Entry = 0</p> <p>Entry via any other pathway = 1</p>
Age	Numeric - Continuous		
Decile	Numeric Binary	<ul style="list-style-type: none"> • Decile 1-7 • Decile 8-10 	

3.1.5.3 Curriculum design and assessment variables

The first two years of the undergraduate course are predominantly preclinical in which the majority of the education is lecture and small group based module tutorials. The third year confers a transfer to learning predominantly in the clinical environment.

In the first two years Module 101 and 201 respectively run parallel throughout the year with the remaining modules delivered in fixed time blocks (see Figure 3-1). A table of all the assessment variables is available in Appendix C)

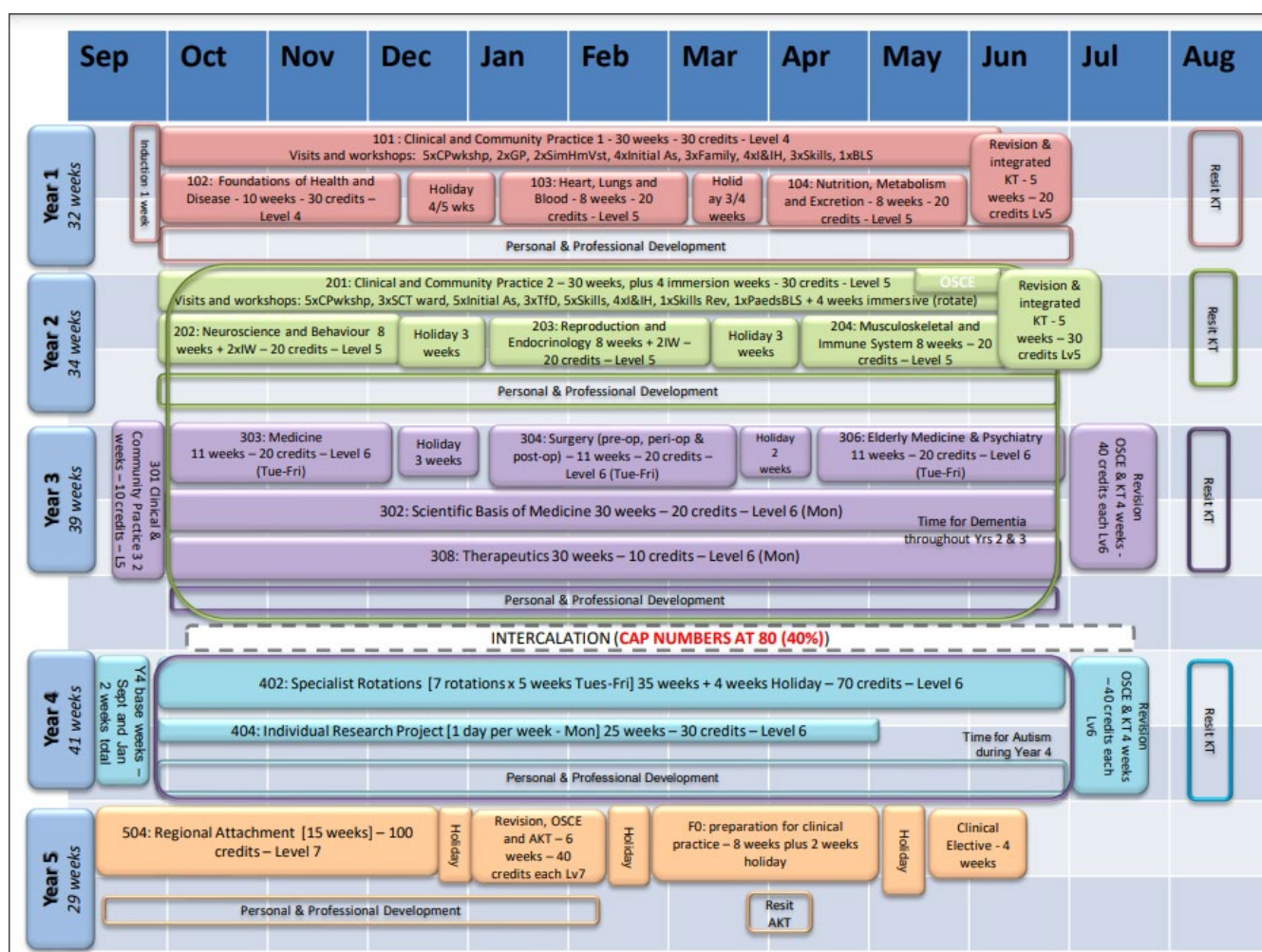


Figure 3-1 BSMS Curriculum including the modular breakdown for all 5 years of the course.

3.1.5.4 Curriculum changes

Due to curricula changes during the retrospective data collection period, some modules are no longer running. Therefore, module nomenclature does not follow systematically in the description of the third-year assessments. For example, Module 305 was previously a paediatric rotation that no longer runs and has been moved into the fourth year. These curriculum changes accounted for a large proportion of missing data and were therefore not included in further analysis.

In addition, there have been changes to the number and format of the assessments within the modules. This was driven by; cohort size increase, the introduction of the medical licensing exam (MLA), changes to the GMC (General Medical Council) outcomes for graduates and a perceived over-assessment of students at BSMS. Figure 3.2 displays the assessment breakdown analysed in the study, and Figure 3.3 shows the current assessment breakdown in the most updated curricula.

The following is a summary of the changes to the assessments that have occurred during the data collection period. The objective structured clinical examination (OSCE) in year 1 was changed to a formative assessment in 2015 and the OSCE in years 2 and 3 has remained summative, but the format has been adapted.

The knowledge tests within years 1, 2 and 3 are now amalgamated into an end-of-year knowledge assessment rather than modular knowledge tests. These knowledge tests contain single best answer (SBA) questions only, with short answer questions (SAQs) no longer used. The module tutorial tests in year one remain but are now formative.

The portfolio score in modules 101 and 201 no longer exist and have been replaced. In module 101, the portfolio assessment has been replaced with a 1,500-word reflective essay centred on learning from experiences in both educational and clinical practice to improve future practice. The portfolio assessment has been replaced in module 201 with a Case Based Discussion (CbD) assignment, a 1500-word assessment covering the diagnosis, assessment and management of a patient with a chronic disease. The portfolio still exists in both years but is now in an electronic format and is formative, with students expected to complete three reflective logs each year. These changes occurred in 2018/2019. The patient information leaflet in module 203 was removed as an assessment in 2021 and was not replaced by any other assessment.

The essay component in module 302 was changed in 2020/2021, reducing the three essays to a singular research methods essay. Finally, as described above, module 305 was discontinued before 2012, and the student selected components (SSCs) in module 307 were discontinued in 2019/2020.

3.1.5.4.1 Year 1

3.1.5.4.1.1 Module 101

This module aims to prepare students for working in the clinical environment and is structured with weekly sessions throughout the year. The morning sessions are lecture based with seminars and workshops in the afternoons. Additionally, there are a number of clinical sessions at GP practices as well as small group discussion sessions with families visiting with their babies. The module covers the socio-political and economic context of practising as a doctor in the NHS as well as global health, an introduction to clinical and communication skills, population health and health inequalities, and working within a multidisciplinary team.

For the cohort of students analysed the module assessment was divided into a portfolio score and an essay, plus an attendance requirement of at least 80% attendance at monitored sessions. The portfolio score contributed to 40% of the modular grade and focused on developing students' reflective practice skills. The portfolio was made up of six 750-1,000 word reflective assignments across the three terms covering:

1. An experience that influenced their perception of challenges in becoming a doctor.
2. A reflection on a clinical consultation
3. A reflection on an ethical or professional dilemma in clinical practice
4. Their experience of cadaveric dissection
5. A reflection on general therapeutic issues they have experienced
6. A patient experience of a consultation in a secondary care setting

The portfolio assessment has subsequently been replaced with a 1,500-word reflective essay centred on learning from experiences in both educational and clinical practice with a view to improving future practice. The family study assignment is a 2,500-word essay analysing the impact of having a baby on the family, the development of the baby, and an appraisal of the initiatives in place to promote infant health. It contributes to 60% of the total score. Failure in any assessment lead to failure of the overall module.

3.1.5.4.1.2 Module 102

Module 102 runs for the first ten weeks of the academic year and is titled the '*Foundations of Health and Disease*'. The module is split into four themes;

1. The Human Body
2. Promoting Health Across the Lifespan
3. Molecular Cell Biology
4. Infection and Immunity.

Theme one covers an introduction to human anatomy (including dissection), physiology, cellular pathology, histology, embryology and imaging of the human body. Theme two covers the biopsychosocial and psychology of health including language and intellectual development as well as the psychology of ageing. Theme three covers molecular cell biology, genetics, intercellular signalling and mechanisms of drug actions and their adverse effects. The final and fourth theme covers microbiology and the immune response.

The assessment constitutes a two-hour knowledge test made up of 110 single best answer questions (SBAs). The pass mark is set using the Angoff method (the mark is based on the performance of the candidates in relation to a defined standard, set by a group of subject experts assessing each question prior to the exam and rating it to answer "what percentage of borderline candidates would answer this item correctly?"³³¹, as opposed to how they perform in relation to their peers). The students are required to attend 80% of sessions to achieve a pass and are marked on an academic skills assessment which is an equally weighted combination of an academic essay, IT skills test, a numeracy test and a tutorial presentation. Previously there was a module essay grade based on a piece of academic writing although this is no longer a component of the module assessment. Failure in any assessment lead to failure of the overall module.

3.1.5.4.1.3 Module 103

Module 103 commences in the second semester and runs for nine weeks. The module is titled '*Heart, Lungs and Blood*' and is divided into five themes:

1. Cardiovascular and thoracic anatomy
2. Pathophysiology of cardiovascular diseases
3. Pathophysiology of respiratory diseases
4. Haematology physiology

5. Impacts of lifestyle on cardiovascular and respiratory health

Students have to pass all assessments and achieve a minimum of 80% attendance to pass the module. The assessments previously included five module tutorial tests that cover content from the lectures and tutorials which is now purely formative in nature. The students also pick a student selected module (SSC) on a wide range of health-related topics which is graded on the basis of attending 80% of the sessions and a ten-minute oral presentation or two-thousand-word essay which is determined by the tutor running the SSC. The knowledge test comprised of a written assessment of a combination of 40 SBAs and 20 SAQs for which the pass mark is based on Cohen's method (a relatively simple and cost-effective tool for standard setting in which the pass mark is set at 60% of what a candidate in the 95th percentile would score).³³²

3.1.5.4.1.4 Module 104

This module commences after the Easter break and runs for thirteen weeks. The title of the module is '*Nutrition, Metabolism and Excretion*' and is divided into three themes:

1. Anatomy, histology and physiology of the alimentary system
2. Anatomy and function of the liver and metabolism regulation
3. Excretory system and renal function and physiology

To pass the module students must achieve 80% attendance of the sessions and pass all the assessments. There are four module tutorial tests covering the contents of the lectures, dissection sessions and tutorial material, which was changed to being formative in 2021. During the period analysed in this cohort it contributed 10% of the knowledge test score, and as such it was kept as a variable for analysis. The remainder of the knowledge test follows the format of 103 with a combination of SBAs and SAQs with the pass mark set by Cohen's method. Similar to module 103 students pick an SSC which is assessed using a ten-minute oral presentation or two-thousand-word essay and they must attend a minimum of 80% of the sessions to pass.

3.1.5.4.2 Year 2

3.1.5.4.2.1 Module 201

Module 201 runs parallel to the additional modules throughout year two with weekly sessions aimed at preparing students for working in the clinical environment. The sessions are split into morning lectures and afternoon placements or workshops. Prior to 2020 the afternoon sessions

were split into primary care visits, secondary care visits, clinical workshops and personal study time. The module is divided into five themes:

1. Socio-political and economic influences on health care provision and health care outcomes
2. Introduction to clinical examination and assessment
3. Safe therapeutic prescribing
4. Multidisciplinary team working
5. Understanding the physical, psychological and social dimensions of ageing, death and dying.

Students also commence the 'Time for Dementia' sessions in which they visit a designated family, where one person is living with dementia, throughout year two and three. This is assessed at the completion of third year. There are two personal and professional development days that cover professional codes of practice, identity, medical culture and healthcare law.

At the end of the year students have an OSCE which contributes 50% of their overall module score. The OSCE that was undertaken by the students during the period of analysis consisted of 16 stations which each last 5 minutes and run over two days and covered a range of clinical scenarios. As noted above this has been changed to a sequential OSCE for future cohorts.

The portfolio which accounted for 40% of the overall assessment score used to comprise of six 750-1000-word assignments over the three terms each, three of which are reflective in nature and three are knowledge-based covering:

1. A reflection of a patient consultation from primary or secondary care
2. A first knowledge-based therapeutics assignment
3. A second therapeutics assignment
4. A reflection of a problematic consultation from primary or secondary care
5. A case-based discussion (CbD)
6. A personal/professional development plan

The portfolio assessment was changed in 2018/2019 and became formative with students expected to complete three reflective logs throughout each year. A Case Based Discussion (CbD) assignment which is a 1500-word assessment covering the diagnosis, assessment and management of a patient with a chronic disease was introduced as a summative assessment in its place but this was not present during the retrospective analysis in this study and therefore not included.

The final component is a 2500-word patient study essay regarding how a patient with chronic disease can be managed and supported, with a specific focus on how the disease affects the individual, the family and society. To pass the portfolio a minimum of 80% of the monitored sessions must be attended.

3.1.5.4.2.2 Module 202

This module is titled '*Neuroscience and Behaviour*' and commences at the beginning of the first term of the second year and runs for 11 weeks. It is divided into three themes:

1. Anatomy and physiology of the central and peripheral nervous system
2. Psychosocial aspects of neurological conditions
3. Modulatory systems in psychiatry

To pass the module overall, students were expected to pass their SSC and knowledge test which comprises SBAs and SAQs. In addition, the students complete two case study assessments (CSA) which comprise multiple choice questions covering material from the module tutorials and associated lectures. The overall module score is obtained from these scores in a 55:35:10 ratio for SBA/SAQ/CSA. After the knowledge test was removed from the end of module assessments and moved to an amalgamated end of year assessment the CSA became formative.

3.1.5.4.2.3 Module 203

This module is titled '*Reproduction and Endocrinology*' and runs for eleven weeks between Christmas and Easter. It is divided into three themes:

1. The endocrine and reproductive systems
2. Fetal development, pregnancy and birth
3. Gynaecology and sexual health.

Assessment during the period of analysis was divided into achieving 80% attendance, grades for an SSC, the creation of a patient information leaflet and a knowledge test in the format of SBAs. The knowledge test and patient information leaflet have been removed as assessments in 2019/2020. The knowledge test as per the other modules in year 2 has been amalgamated into an end of year assessment.

3.1.5.4.2.4 Module 204

This module is titled '*Musculoskeletal and Immune systems*' and runs for eleven weeks after Easter until the end of the third term. The module is split into three themes:

1. The immune system
2. The structure and function of the musculoskeletal system
3. The physiology and pathophysiology of the musculoskeletal system.

It is primarily taught through dissection, lectures and module tutorials. Assessment for completion of this module includes a poster presentation in which students work in pairs to produce a scientific poster on a published research title, delivering a ten-minute oral presentation of the poster in a dedicated session. As per all the other modules they must attend 80% of sessions to pass. Finally, the knowledge test comprising of SBAs at the end of the module has been removed and is now a component of the amalgamated yearly knowledge test.

3.1.5.4.3 Year 3

The majority of year three comprises three ten week blocks. Students rotate through Modules 303 (Medicine), 304 (Surgery) and 306 (Elderly and Psychiatry). These modules have a logbook assigned to it which represents the minimum clinical experiences that the students are expected to complete to pass the module. Additionally, each of these modules the students have a case-based discussion (CbD) in which a student is expected to take a history, examine, create a differential and a management plan for a patient they have seen on their ward placement. The students then follow the patient journey whilst they are an in-patient. This is presented to two senior physicians who test the students understanding of the underlying medical/surgical/psychiatric condition. The student receives verbal and written feedback at the end of the presentation as well as their grade. At the end of the year the students sit an OSCE and knowledge test comprising SBAs.

3.1.5.4.3.1 Module 301

This module runs for the first two weeks of the third year in which students attend clinical and community rotations and is assessed through a logbook with sign offs for expected competencies and a minimal attendance of 80%.

3.1.5.4.3.2 Module 302

Titled '*Scientific basis of Medicine*' runs throughout the year. Students during the period of analysis had to complete three research methods essays as well as a short answer questions exam. This has been changed to a singular research methods essay and the short answer questions exam has been discontinued with the content being covered in the end of year knowledge test.

3.1.5.4.3.3 Module 303

See above

3.1.5.4.3.4 Module 304

See above

3.1.5.4.3.5 Module 305

This module was discontinued prior to data collection of this cohort of students and therefore no data exists. It had covered paediatric and maternal health which is now delivered in year 4.

3.1.5.4.3.6 Module 306

See above – students have individual CbDs for Elderly medicine and Psychiatry.

3.1.5.4.3.7 Module 307

During the period of analysis this consisted of two student selected components (SSCs). This has since been discontinued.

3.1.5.4.3.8 Module 308

Pharmacology and therapeutics module with a graded assessment consisting of attendance, practical prescribing tasks, and engagement with interprofessional education and completion of an online formulary (SmartDrug).

Assessments of students captured in the study

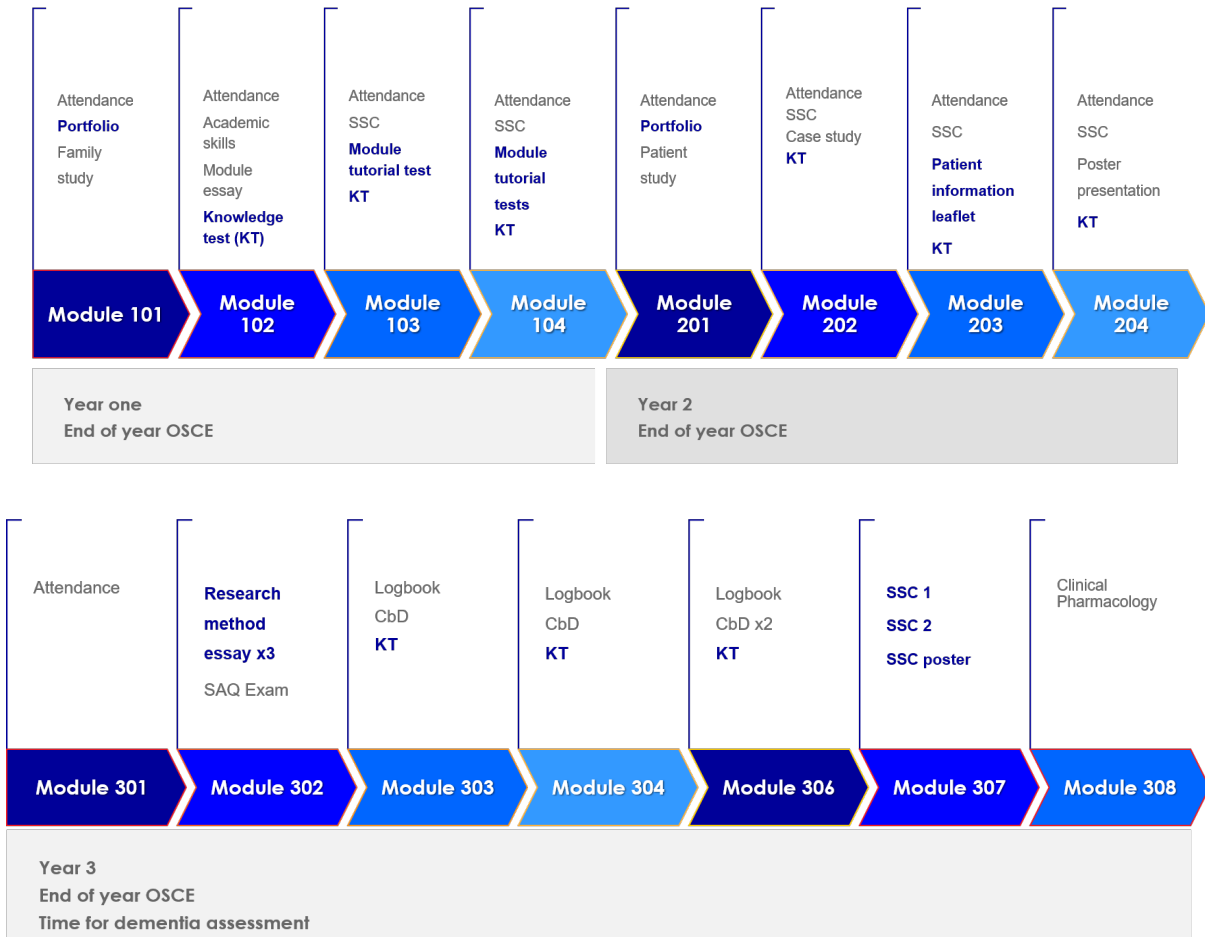


Figure 3-2: Curriculum design and assessment of the participants involved in the study. The assessments that have changed are highlighted in **Blue**.

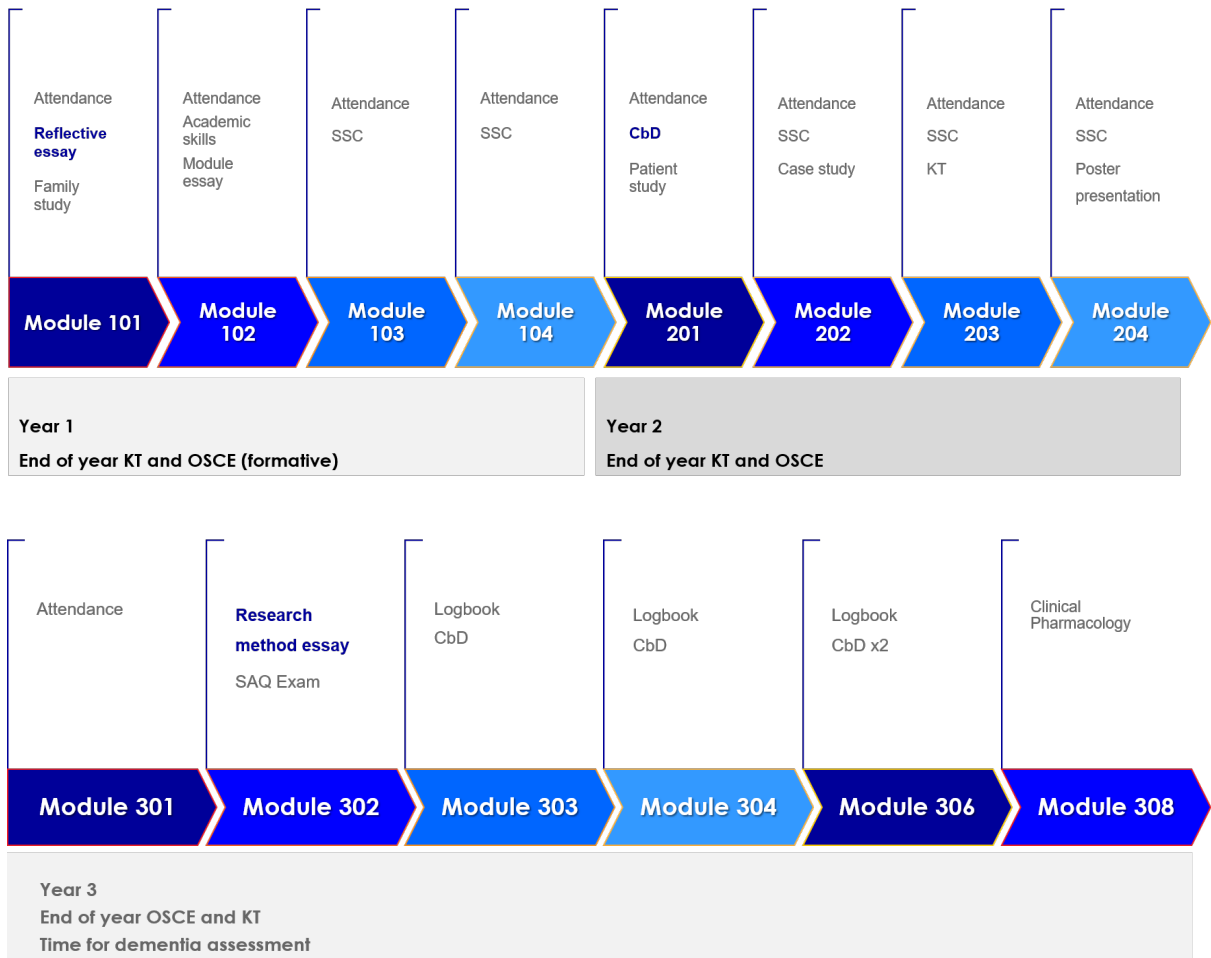


Figure 3-3: Current curriculum design and assessment of students at BSMS. The assessments that have changed are highlighted in **Blue**.

3.1.6 Statistical Analysis

3.1.6.1 Creating the dataset

Multiple datasets were contained in databases held by the admissions team at UoB and the assessment team at BSMS. Databases were merged using the student identification number, duplicate results were cleaned at this point. Databases from cohorts between 2013 and 2017 were included. All assessment variables were included excluding cumulative assessment scores as they were duplications of other assessment variables already present in the dataset.

Exception checking for invalid entries was completed once the datasets were amalgamated and these entries were not included in the analyses. Each variable was checked in turn and nonsensical values were removed, all values were graphed to ensure they were on the same scale. Missing data were managed by undertaking only complete case analysis (students with missing data for that analysis were excluded). This was felt to be a reasonable approach as the data were missing due to the nature of the collection and storage and was not related to student performance. In addition, missing data were often due to the discontinuation or introduction of the assessment during the retrospective period of analysis, for example, the research, genetics and pharmacology essays in module 302 were discontinued with only one cohort sitting those assessments. These were included in the univariate analysis but not included in the final models. The first attempt at the assessment score/grade was used in situations of re-sit assessments and re-sit data were excluded. Scores of zero in continuous assessments indicated the student had not taken the assessment and the score was excluded from the analysis.

Due to small sample sizes demographic variables such as ethnicity were combined into sub-groups and numerically coded where required for future analyses (Table 3-1). Such that White students included students originally coded as White British or White other, students coded as Black included Black or Black British – African or Caribbean or Mixed heritage and so forth. This process was replicated for disability disclosure and entry route into medicine as noted in Table 3-1. Ethnicity, disability disclosure and entry route to medicine were each also combined to binary outcomes for future analysis due to small sample sizes of individual sub-groups. For example, ethnicity datum was utilised as nominal data but were also dichotomised to White and other ethnic group for analyses.

This process was repeated for disability data which were utilised as nominal and binary data when combined, with students with no disability (reference group) compared to those who disclosed

any disability. Entry route data were both nominal and combined to binary for comparison of entry post A-level (reference group) in comparison to any alternate entry route.

Outright failure of any assessment was relatively rare resulting in small sample sizes. In order to better understand whether failure in similar assessment modalities such as attendance, or style of assessment was associated with placing in the lower three deciles, dummy variables were created that encompassed cumulative failure was analysed. These included failure to meet the attendance requirements of any or multiple modules, failure of either or both OSCE assessments, failure in any or multiple knowledge tests throughout years one to three, and finally, failure in any or multiple of the CbD assessments (see Appendix C).

Categorical assessment data which included fail, pass, merit and distinction were dichotomised to binary outcomes (pass/fail) in which pass, merit and distinction were grouped together for future analyses (Appendix C).

Rounding methodology as advocated by the Higher Education Statistics Agency (HESA) who are the designated data body for England, and adapted to a smaller dataset to reduce any risk of student identification and include:

- Percentages are not published if they are fractions of a small group of people.
- Averages based on 7 or fewer individuals are suppressed

3.1.6.2 Descriptive analysis

Descriptive statistics were used to summarise the relationship between academic performance and the potential predictor variables for both continuous and categorical variables. As the continuous variables were normally distributed they are presented by their means with standard deviation and range; with proportions given for categorical data. Age was utilised as both a continuous variable and divided into age strata of 18-20, 21-30 and >30 for analyses.

Demographic characteristics of the cohort of BSMS students included in this study will be compared with national data available from the Higher Education Statistics Agency (HESA) to assess for comparability. Logistic regression was used for univariate analysis to examine the strength of association between the predictor variables and the outcome variable, i.e. did the student place in the bottom three deciles at the end of third year. Mean centering, the process of subtracting a variable's mean from all the observations on that variable, can reduce statistical

inference and multicollinearity in regression models,^{333,334} however, this did not significantly affect the outcomes of the univariate analysis and was therefore not utilised further.

3.1.6.3 Multivariable analysis

Based on a combination between an a priori approach from the DAG diagram (see Figure 3-5) below and initial univariate analysis, potential predictors of lower decile placement were further evaluated using multivariable logistic regression analysis, applied to the comparator group of those who placed in the top seven deciles and those who placed in the bottom three deciles.

Student's age, ethnicity, gender, presence of a disability and entry route were included as there is strong existing evidence of their association with the outcome of interest. Interaction effects between gender and ethnicity were investigated and an interaction term was included in multivariate analyses. A multivariable model was created in a forward stepwise fashion, retaining assessment variables associated with the outcome of placing in the lower three deciles considering a 95% confidence interval that did not cross 1 but additionally included variables with a strong theoretical relationship with the outcome of interest at the univariate analysis stage (Figure 3-3). In order to retain power within the model we ensured no greater than one parameter per ten participants with the outcome of interest are included in the analysis.

Three models were developed to analyse which assessments within year one, two and three explained the greatest degree of variance associated with end of year three decile outcome. The logistic regression models were compared on Nagelkerke R^2 , which is commonly reported for logistic regression modelling.^{152,335} It ranges from 0 to 1 with a larger value indicating a larger proportion of the variance is explained by the explanatory variables in the model.

Due to low overt failure rates in attendance and assessment sub analyses were performed to analyse whether cumulative or any failure in attendance or failure in similar assessment modalities was associated with decile placement. A further analysis was performed to assess whether student performance was fixed or whether students were able to move between decile placements between years 1, 2 and 3.



Figure 3-4. Variables that influence academic performance. Adapted from Richardson et al.³² and Sander et al.³³⁶

The third year OSCE and knowledge test make up the outcome variable and are therefore on the causal pathway and will not be included in the multivariable model.

Data were collated in Microsoft Excel (2016) and all analyses for the thesis have been undertaken in Stata version 16 statistical software (StataCorp. 2019. Stata Statistical Software: Release 16. College Station, TX: StataCorp LLC).

3.1.6.4 Confounders and Multi-collinearity

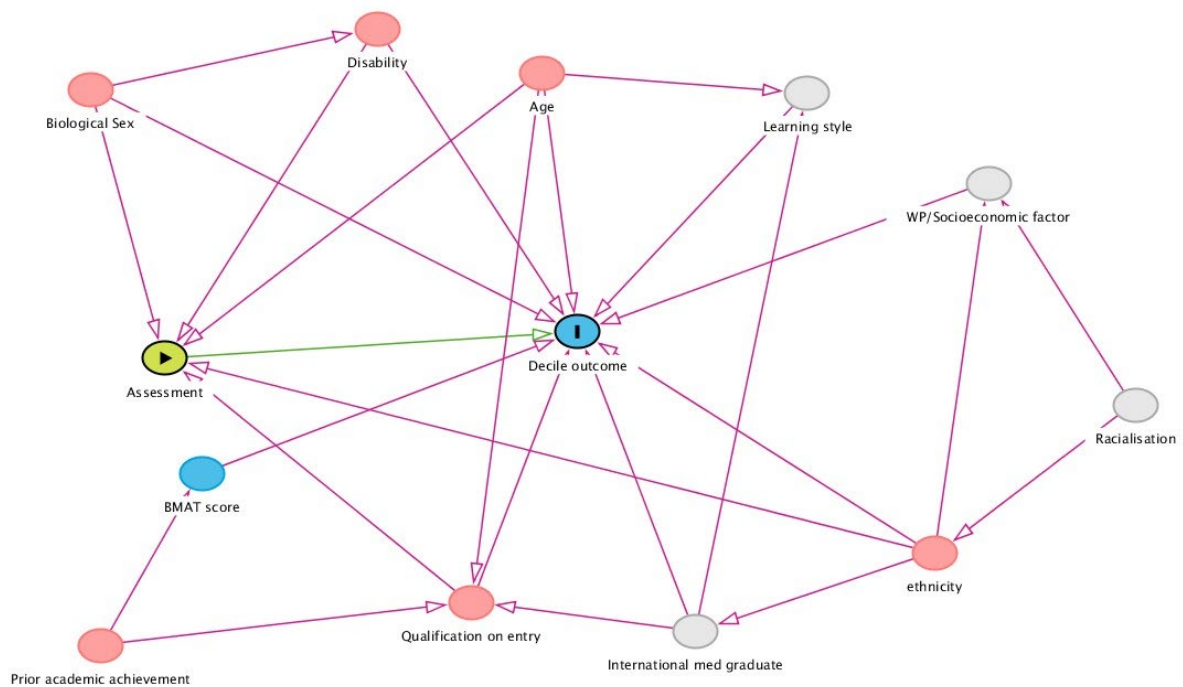


Figure 3-5. A directed acyclic graph (DAG) to aid identification of causal structures in the data

Tests to see if data met the assumption of collinearity with demographic variables indicated that multi-collinearity was not a concern (Variance Inflation Factor (VIF)³³⁷ 1.15 for demographic independent variables).

3.2 Study 3: How do students make sense of their experiences at medical school and attribute the causes of their academic difficulties?

Informed by the above, a qualitative study was conducted to explore the lived experience of 4th and 5th year medical students who placed within the lower 30% of academic performance within their cohort based on the range of assessments taken across years 1-3 of the undergraduate programme that determines the decile ranking.

3.2.1 Study Design

This study aim was to explore the lived experience of medical students who face academic difficulty using an interpretative phenomenological analysis (IPA) approach. Data was obtained

from semi-structured interviews. The data were analysed on an individual level then subsequently at group-level for emergent themes.

3.2.2 Interpretative Phenomenological Analysis

Part of this thesis aims to understanding the lived experiences of students who face academic difficulty and how these experiences influence their behaviors which impact their engagement with the support systems available to them. IPA is a qualitative methodology concerned with understanding the process of meaning-making as central to working out how we interpret experiences, and what influences this process of interpretation.³³⁸

The theoretical underpinnings of IPA include phenomenology, hermeneutics and idiography. Phenomenology was first conceptualized by theorist Edmund Husserl in attempts to provide a description of the way things appear in our conscious experience. The way things are in 'reality' and the way they are experienced may not be the same. Phenomenology is the study of structures of consciousness as experienced from the first-person point of view.³³⁹ We aim to "provide an account of lived-experience in its own terms rather than one prescribed by pre-existing theoretical preconceptions".³³⁸ The focus of my study is to examine how individuals who have experienced a similar phenomenon (ranking within the bottom three deciles of scores at the medical school) make meaning or sense of their direct lived experience. Hiedegger furthered the concept of phenomenology into existential phenomenology and hermeneutics in which the observer or researcher cannot separate themselves from the world and needs to understand the mind-set and language of the person being observed as a way in which they mediate their experience of the world in order to translate their experience. IPA acknowledges humans as sense-making and self-interpreting beings³⁴⁰ and as such the researcher is attempting to understand their participants' way of understanding their experience and through interpretive analysis make meaning comprehensible by translating it. In IPA the researcher accepts their active role in the analysis which involves 'close interpretative engagement'³⁴¹ on their part. IPA is thus often described in terms of double hermeneutics in which the participant is attempting to make meaning of their experiences and the researcher is attempting to make meaning or sense of what is being said or written:

"the researcher is making sense of the participant, who is making sense of X."³⁴¹

In this role the researcher can be seen as co-creating the knowledge that stems from the study. As the primary researcher being present but not being intrusive. The other double hermeneutics a

researcher must consider is the balance between the interpretative position they take between the hermeneutics of empathy and the hermeneutics of suspicion.³⁴² Smith et al. believe a good researcher combines both stances in attempting to understand what it is like for the participant but also questions, analyses, illuminates, and make sense of their experience.³³⁹

Quantitative research espouses the need to remove bias and thus preconceptions and the self from the research in attempts to find objective truth. However, I would argue the way in which we conceptualize the research question, and why we are interested in it reflect our prior knowledge and experiences. Qualitative research welcomes the self into research but there is a need to be reflexive regarding what preconceptions we are bringing into our research and how these influence our interpretations. Within IPA there are varying opinions in how these preconceptions termed fore-structures are considered with regards to the interpretation of the data. Husserl advocated bracketing, also known as *epoché*, in which one puts aside previous understandings, knowledge or assumptions about the phenomenon of interest to take a naïve approach in order to understand the essence of the experience.³⁴³

However, many people have argued that it is impossible to “bracket out” ones’ prior experiences, culture and knowledge. Heidegger argued that all understanding is based on prior understanding termed fore-structures (fore-having, fore-sight and fore-conception) in which we bring our prior experiences, assumptions and preconceptions to the encounter with the participant.³⁴⁴ This requires reflexive awareness to the ways in which fore-structures can influence the interpretation of the data. Some of these may be visible prior to starting the research but often it is during engagement with the text or interview data that one becomes aware of their preconceptions.³³⁹

Idiography refers to understanding an individual’s retrospective account on their own terms, in their own words and the researchers’ commitment to examining their experience in turn before moving onto general claims or statements.³³⁸ In this study it refers to the account the participants give of their experience at medical school within the context of their academic performance. Thus, any interpretations must remain clearly apparent from the participants understanding and expression of their experience. IPA does not aim for generalization but rather on creating a narrative account of the themes that have emerged from the analysis described and exemplified with extracts from the interviews. This retains the voice of the participant’s personal experience in the form of the emic perspective.³⁴⁵

Van Manen outlines six principles to help guide IPA studies which I have followed: (i) investigating a phenomenon that interests us, (ii) investigating experience as it is lived rather than conceptualized, (iii) reflecting on the essential themes that characterize the phenomenon, (iv)

describing the phenomenon through writing and rewriting, (v) maintaining a strong pedagogical relation to the phenomenon, and (vi) balancing the research context by considering the parts and the whole.³⁴⁶

3.2.2.1 Project Aims

The overarching aim was to explore the lived experience of medical students who face academic difficulty with a particular focus on their experience of assessment, teaching, transition to clinical learning, failure, ranking and support processes. The creation of a narrative of the student's lived experience aimed to give a 'voice' to the learner and inform future curricula design, assessment, supervision and remediation practices.

The research question:

How do medical students in the bottom deciles of academic performance understand and attribute their performance?

3.2.2.2 Stakeholder consultation

Five medical students who were involved in remediation during the 2019/2020 academic year but not known to the primary researcher agreed to complete an anonymised questionnaire to aid research design to ensure that the recruitment methods and interview processes (organisation and content) were acceptable, thus optimising study success.

The following changes were made on the basis of the responses: The term 'borderline' medical student was removed as this was felt to be a negative descriptor of a student and would risk causing unnecessary adverse emotions, though no alternative descriptor was suggested by the students. The optimal interview duration was deemed to be 60 minutes but extend up to 90 minutes as the upper limit of acceptability, the interview location in the Southpoint office was acceptable (if face-to-face interviews were to be conducted) and correspondence by email was preferable. The Southpoint office is located adjacent to the Royal Sussex County Hospital and the Audrey Emerton medical school teaching facility where medical students attend clinical rotations. The office is frequented by doctoral research students and faculty members from BSMS. There is a private office space that can be booked for meetings and research interviews that provides privacy for participants.

3.2.2.3 Participants and sample

While there is no consensus regarding sample size in IPA it has traditionally been quoted as ranging between 2 and 25.^{347,348} Smith, Flowers and Larkin however recommend a concentrated focus on a small number of cases in doctoral studies and suggest a rough guide of between 2 and 6 participants as the primary concern in IPA is to provide a detailed account of individual experience.³³⁹ As Cresswell states, *“the focus of these types of studies is to ensure homogeneity of the phenomena being studied to gain a more in depth understanding of the similarities and differences in how it is experienced by various people”*.³⁴⁹ In this study we were interested in understanding the experience of those students who ranked in the lower three deciles and how that impacted their behaviours and beliefs.

The intention was to recruit up to a maximum on 10 participants to this study. Stratified sampling was used to ensure we captured students who shared the experience of placing in the lower deciles of academic performance and had completed the first three years of the course and thus had experience of both clinical and preclinical aspects of the course. In order to avoid selection bias, no further limits were included based on demographic variables.

The inclusion criteria used for this study were:

- Medical students enrolled at BSMS who had completed their third or fourth year assessments in the academic year 2018/2019. These students have experience of both the preclinical and clinical years and have undertaken numerous multimodal assessments. They were therefore best positioned to discuss their experiences of assessments, their outcomes, and how they experienced learning in both preclinical and clinical environments.
- Medical students must have placed in the lower 30% of assessment ranking at the end of third year assessments. These students would have cumulatively placed in the lower 30% of multimodal assessments that contributed to ranking. Decile score, as explained in section 3.1.5.1 is being used as a surrogate for poor academic performance relative to their peers.

Exclusion criteria:

- Medical students who left the undergraduate programme prior to course completion. It would not have been possible to contact students who had discontinued on the course without breaking anonymity or confidentiality.
- Medical students who placed in the top seven deciles at the end of third year assessment.

3.2.2.4 Ethical considerations

Ethical approval was obtained from the BSMS Research Governance and Ethics Committee (RGEC: ER/BSMS9H3Z/2, Appendix D).

As the primary researcher I am responsible for ensuring no harm comes to any participants. There was a risk that the process of exploring the participants' experiences of their academic performance could cause distress. Studies have identified external contributors to performance such as mental health issues, bereavement or difficulty socialising at medical school. In addition, some of the participants may have failed assessments and the process of this has been linked with significant negative emotional responses in prior studies.^{174,175,260}

Participants were informed prior to agreeing to join the study of the broad outline and expected areas of inquiry that were to be discussed in the interview and were provided via a participant information sheet (PIS) (Appendix E) and written consent form (Appendix F). The consent form was revisited on the day of the interview to ensure participants remained happy to continue and any queries were addressed.

Student Support services were informed of the study to provide research specific support to mitigate the potential negative emotional response that could have arisen from participants during the interviews. I also ensured as the primary researcher that I was aware of the comprehensive support network available within the university and locally, including governmental and charitable services to signpost participants to if required. Participants were advised that if they were to feel distressed the interview could be stopped at any point and that they would not have to expand on any sensitive issues if they did not feel comfortable doing so.

Furthermore, participants were informed that should they disclose something of concern regarding the safety of themselves or others that I had an ethical obligation to encourage them in the first instance to inform the appropriate members of staff at the medical school. The participants were advised that should they not wish to do so I may be obliged to break confidentiality to contact the relevant support systems in rare cases. All study digital data and documentation was stored on password protected university data servers and will be retained for 5 years in compliance with Good Clinical Practice recommendations.

3.2.2.5 Recruitment

The recruitment strategy consisted of an email invitation to the study being sent out by administrative staff to all students in their fourth or final year at BSMS in the academic year 2020/2021. The email contained a broad description of the study and the contact details of the primary researchers for students to self-identify on a voluntary basis if they met the inclusion criteria. This approach was taken to avoid singling out students and directly contacting them regarding a topic that may be sensitive and evoke negative emotions. The email invite included a participant information sheet and consent form and outlining the study aims and processes in greater detail.

The recruitment email (Appendix H) was sent out on three occasions with successful recruitment within two months. In total, 10 students responded to the email invitations. Two failed to respond to further email correspondence to discuss the study in more detail and this was considered a withdrawal of interest. One student had queries that were answered in email correspondence before agreeing to participate in the study

3.2.2.6 Anonymity

Study participants were assigned pseudonyms in order to protect their identities. Participants were given the choice to pick their own pseudonym but none chose to do so. It was acknowledged that some specific information declared during the interviews had the potential to reveal identities. Demographic data regarding their identity would not be utilised as descriptors of the individuals for any published research. Masking of study identities was made clear in the participant information sheet and consent form.

The participants were provided with the transcript of their interview to review and were offered the opportunity to retract, add or clarify any responses. None of the participants made any changes to the transcripts. Participants were also given the opportunity to withdraw from the study prior to the personalised data being unpaired in the analysis. From this point the participant was advised they would be unable to withdraw their data.

3.2.2.7 The impact of the Covid-19 pandemic

The COVID-19 pandemic and its effects on the student experience and their assessments led to a change in recruitment policy. I was seconded back to clinical medicine for a period of three

months during the first wave of the pandemic (March-June 2020). This altered the timeframe for acquiring ethical approval to approach participants for interview. The recruitment emails were further delayed to ensure they did not occur within close proximity of any summative assessments to avoid any additional anxiety or stress to the participants. This meant that the interviews for the final years took place after they had completed their finals examinations, and for the fourth years the interviews took place a few months before their end of rotation assessments.

The pandemic also had a significant effect on how the curriculum and assessments were delivered, which was considered prior to the interviews. There were unique changes to the participants' experience, including more online structured teaching in the clinical years to offset the reduced time on placement. There was also a greater structure to clinical placements with students placed in small groups of two or three and directed to specific clinics and ward rounds. In addition, the knowledge test at the end of third year was completed online in their own homes and the OSCE was converted to a formative assessment due to the limited clinical exposure they had received. The ranking system is part informed by the results of the third year assessments and due to changes in the assessment this will have impacted some student's abilities to transition between the decile scores (this would only have been relevant for the participants who were in their fourth year). There were no assessment changes made for the final year students who sat the written and OSCE examinations in their traditional format but with COVID-19 precautions.

Some of these changes may have influenced student responses at the interview however I felt it was reasonable to continue with the recruitment strategy as the pandemic affected all students universally and the aim of the qualitative study is not to provide statistically generalizable themes, but rather aim to explore analytical generalisability; i.e., the identification of underlying meanings and mechanisms within a context and environment specific to the student population under investigation.

An additional alteration due to the COVID-19 pandemic was a switch to virtual interviews. In person face-face interviews have traditionally been seen as the 'gold standard'³⁵⁰ but given local social isolation guidance and risk assessment a decision was made to hold the interviews virtually using Microsoft (MS) Teams software in line with university guidance. Advantages of online interview formats have been explored in the past. Purported strengths include convenience and ease of use, improved accessibility, time saving as there is no need for travel, reducing costs as well as being safe for both interviewer and participant as they are able to conduct the interview in

their own space ³⁵¹⁻³⁵⁶ which, from feedback in the interviews, made them feel more relaxed and able to reflect on their own experiences.

Potential disadvantages of this approach include; technical issues or time-lags on the video calls^{351,357-359}, participants having the incorrect software³⁵⁷ and potential limitations of the viewing perspective from the camera and limitations to view body language of the participant.^{360,361}

Reassuringly there were no technical issues during the interview phase. All students at BSMS had access to Microsoft Teams software and were familiar with its use as it was the main platform used during the switch to online learning that occurred during the pandemic.

3.2.3 Data collection

IPA aims to elicit rich, detailed first-person accounts of experiences. It was important to ensure that areas of interest from the literature were covered within a structure that also allowed flexibility for novel and unexpected topics to arise.³⁴⁵ This approach aligns itself to utilising semi-structured, one-to-one interviews with open-ended questions to allow participants to speak freely, reflect and share their experiences in their own words.³⁶²

A provisional interview topic guide was developed through in an iterative process³⁴⁸ (Appendix G). The original topics for exploration became apparent from the thematic analysis established from the scoping review, as well as the wider literature discussed in chapter one. The questions were further developed and adapted during discussion between myself and the research supervisor (RDV) who has extensive experience in qualitative research, specifically IPA, and semi-structured interview techniques. I also undertook a number of online qualitative interviewing technique workshops prior to developing the protocol which was used in the pilot interviews and further adapted (see section 3.2.3.1).

The interview began with a preamble that included an introduction to the researcher, any queries that had arisen from the PIS, the receipt of consent and finally an agreement on the pseudonym that would be used by that participant once the interview was transcribed. The questions were kept open and covered five main themes;

The subsections covered the lived experience of students with regards to:

1. Motivation to study medicine and become a doctor
2. The experience of the curriculum, teaching and learning styles used throughout the course including transition from pre-clinical to clinical environment
3. The experience of assessment, feedback and the ranking system used at the medical school

4. Their experience of support systems and remediation practices.
5. The environment at medical school and any external personal problems encountered during their time at the medical school

The interview was concluded with 'wind-down'/'clean up' questions aimed at allowing the participant to raise any topics that had not been covered in the interview or to clarify any points raised previously.

The interviews were undertaken online using video conferencing via Microsoft Teams software and audio recorded on an external recording device in line with BSMS policy. National Institute for Health Research Good Clinical Practice and valid informed consent training was undertaken prior to interview commencement.

3.2.3.1 Pilot interviews

This phase was held after ethical approval for the qualitative study had been granted. As a novice qualitative researcher I felt it was important to undertake a number of pilot interviews to become aware of my strengths and weaknesses when conducting interviews, as well as to be prepared for the practical considerations of online interviewing. After the interview I took field notes guided by the principles described by Braun and Clarke,³⁴⁸ focused on reflecting on my performance and interview technique drawing on areas for improvement, my reaction to the participant, how the chosen location influenced the interview, how the interview went, the important features from the responses, ideas for analysis and additional potential questions.³⁴⁸

Three pilot interviews were undertaken. The objectives for this were fivefold:

1. To pilot test the audio recording equipment and MS Teams platform for the online interview.
2. To test the clarity of the questions and whether they were interpreted as intended.
3. To identify any obvious themes or topics not covered in the initial protocol.
4. To practice, assess and reflect on my interview technique and style.
5. To trial creative methods (comic strips) to aid rapport building and allow the participant to consider some of the themes that were likely to be discussed in the interview.

The three participants included in the pilot phase were:

- A 33-year-old, female, fellow Medical Doctorate (MD) student with a background in medical education theory and care of the elderly training physician in her registrar years. She had

disclosed prior to the interview that she had never placed within the lower deciles at medical school or failed any assessments in her time at medical school.

- A 23-year-old, male, 4th year medical student at BSMS, known to the primary researcher as a mentee, disclosure regarding decile placement was not requested prior to the interview.
- A 32-year-old male, Doctor of Philosophy (PhD) student with a background in medical education theory and an anesthetic trainee, who had experience of placing in the lower quartile of medical performance whilst at medical school.

There were no software concerns during this phase. Whilst no new areas of inquiry became apparent, the topic of ranking provoked significant emotional responses. These included the sensitivity associated to ranking and the lack of disclosure amongst peers as well as the impact ranking had on their sense of achievement and position in relation to their peers. One of the participants noted the impact ranking and failure had on their sense of belonging and career aspirations. This made it clear that these were areas for exploration in the study.

Overall the guide felt easy to follow and I felt confident to stray from the guide where appropriate and follow participant's cues. However, there were areas regarding my interviewing technique that required consideration and improvement:

- I used terms such as "did you mean this?" followed by a conclusion that did not always reflect what the participant intended. Whilst in the pilot interview the participant felt able to challenge my conclusions and clarify the points, future participants, who will be students, may not feel able to disagree due to power dynamics within the interview. An alternative approach could suggest what the interviewer understood by the statement and offer the participant a chance to clarify this, e.g.

"I Understood...please clarify if that was not the case?"

- There were occasions when I interrupted the participant during a pause in which the interviewee was considering their response which highlights the need to feel comfortable in the silence between questions.
- There were a few occasions where I used value judgments such as "I like how you phrased that" to certain responses. This can lead to uncovering my fore-structures and thus frame further answers by the interviewee, in addition the interviewee may wonder why other responses did not elicit the same value judgments.

- I reflected on my tendency to start analyzing the responses of the participant during the interview which Smith et al. urge researchers to resist as this can lead to misinterpretations of the data being collected and close down avenues for further exploration.³³⁹
- During one of the interviews it became clear the participant was hesitant to discuss personal issues external to the medical school that may have impacted their academic performance. It felt important to ask about this information but also reassure the participant that they did not have to disclose any information they were uncomfortable about. This experience highlighted the potential difficulty in how far and how appropriate it may be to ask about personal issues and to be led by the participant.

Finally, during the pilot studies I was wary that initiating the interview with participants I had no prior relationship with using direct questions may not be the easiest way to build rapport. Whilst not necessarily a traditional approach in IPA studies I decided to use comic strips to open the interview. This was primarily due to my reservations that students may not feel open to talk and reflect on their experiences on a deeper level.

*“Comics are fun, which allows them to circumvent people’s reluctance to talk about difficult issues. They provide access to conscious and unconscious ideas”.*³⁶³

In my teaching I have used comics to help students reflect on how they subconsciously see the world and themselves within their experiences and this has allowed more in depth reflections. The aim of using a comic or drawing was twofold. To help the participant consider some of the topics we were going to discuss in the interview prior to the day and secondly as a base from which we could delve ‘into’ their story. In interviews there may be topics which participants are ‘defended’ about; when there are social or psychological barriers to participants revealing their true feelings or thoughts. In this study, as the participants were aware I am employed by the institution, they may have felt uncomfortable in appearing critical and this may limit how comfortable the participants feel to offer honest reflections on their experiences. Interviews with comics may make participants feel safer and more willing to share and are particularly useful for sensitive topics.³⁶³

I provided clear instructions to the participants; requesting a drawing of a past memorable assessment at medical school and re-assured them that the drawing would not be used in the analysis but as a starting point to help open the discussion. I am not a talented artist and mostly draw stick figures, but I am aware that requesting a drawing can create fear in learners and I

presume the same may have been the case for the participants. I stressed that the drawings did not have to be well crafted and provided an example of a memorable assessment I had drawn of my own experiences to allay any fears of the skill level required.

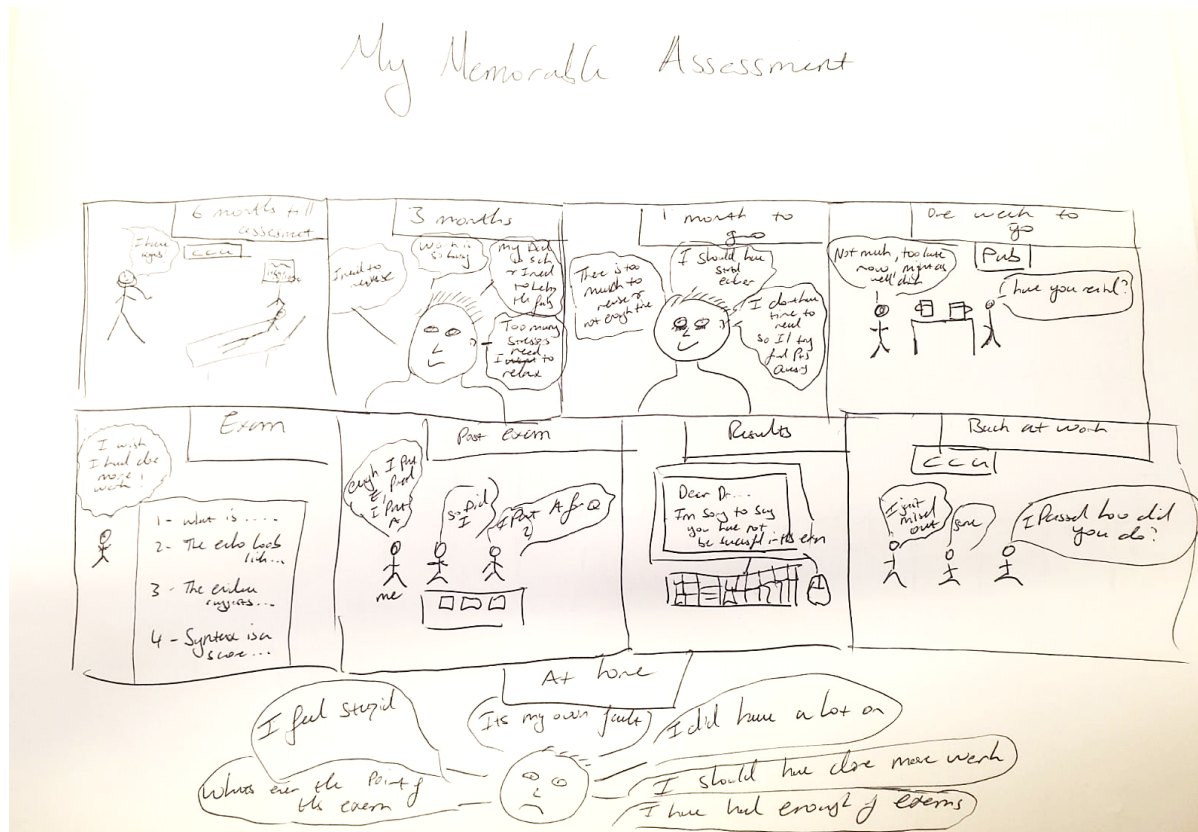


Figure 3-6. My memorable assessment comic that was sent to all participant prior to the interview as an example of the skill level required.

The comic was successful in the final pilot interview where it provided a focal point for the participant to discuss their experiences of assessment and linked to other areas of inquiry through the language of the participant. The feedback from the pilot participant was that it helped them consider what might be asked during the interview and helped bring back memories that they had forgotten about.

3.2.3.2 Study Interviews

All eight interviews were conducted online using Microsoft Teams software. As discussed above, each interview started with an introduction to myself and the study, written informed consent

was received and an opportunity was provided for the participant to raise any queries before commencing the audio recording.

All of the participants were happy to keep the video running, without it being recorded, during the interview as this helped build rapport, engage with the participants and respond to visual cues.³⁶⁴ It also allowed for documentation of verbal and non-verbal data that were included in my reflections of the interviews that were conducted at the completion of each interview, in line with the prior agreement that no video recordings were made. Once the recording devices were activated the participants were asked to discuss their drawing and show it up to the screen to commence the interview. The instructions for the drawing were relatively open to interpretation, it needed to be about an assessment during their time at the medical school. Six of the eight students completed drawings of a memorable assessments which was used as a focal point for the initial discussion but was not used in further analysis. The remaining two chose not to complete a drawing citing a lack of time and artistic ability as the reasons behind not doing so.

When describing their drawings, the participants tended to reflect on topic areas that existed within the interview schedule, this allowed for a free flowing interview led by the participant with guided questions when appropriate. This allowed for a more organic interview to unfold in which the sequence of questions varied from participant to participant.

At medical school I was predominately ranked in the lower quartile of assessment outcomes which is one of the reasons I was interested in researching this topic area. During the interviews I was unsure whether to disclose my personal experiences for fear of impacting the direction of the interview or introduce my 'pre-structures' and thus influence the data. However, it also felt disingenuous to hide the reasons for my interest in the topic area when directly asked by a number of participants in the 'wind-down' questions. At the end of the interviews the audio was saved on the Dictaphone device and downloaded onto university server awaiting transcription.

Field notes are a useful tool in qualitative research to enhance data and provide rich context for analysis and are recommended as essential to rigorous qualitative research.^{349,365,366} They can function to prompt the researcher to observe the environment and interactions between themselves and the participant, document sights, smells, sounds and researcher impressions at the time of the interview, encourage researcher reflection and identification of bias, facilitate preliminary coding and provide essential context to inform data analysis.³⁶⁵⁻³⁷⁰

Using the content guide from Phillippi and Lauderdale, field notes were taken directly after the end of each interview and were supplemented ad hoc when further reflections on the interview

took place, for example after discussion with my supervisor. These covered the date and time the interview took place, the location of the interview, the overall atmosphere, non-verbal behaviors, the responses to the questions, tentative ideas of codes. In addition, I reflected on my performance at interviewing and facilitating the discussion, my thoughts of the interview and of the participant, any potential biases, and ideas for any changes to the topic guide or interview technique improvement.^{366,367,371} Early participants drew attention to the use of the log-book, the role of academic tutors, and how ranking impacts future career aspirations, these were added to the topic guide for subsequent participants.

3.2.3.3 Transcription

It is impossible to capture all features of discussion and interaction, and thus transcription is a somewhat selective process.³⁷² Transcription in of itself is an interpretive activity as the researcher decides on which aspects of the social interaction to include in the transcript and as such is a component of the analytic process.³³⁹ IPA opposed to other types of conversation analysis primarily focuses on interpreting the meaning of the content of the participants account at the semantic level with less emphasis on the prosodic features (pitch, loudness, length of sound, intonation, pauses, rhythm, stress).³³⁹ Regardless, false starts, significant pauses and non-verbal utterances should be included in the transcripts.³³⁸ There are no rigid rules regarding how to transcribe the data but researchers are encouraged to immerse themselves in the data and personally transcribe as part of the analysis.³³⁹ I acknowledge this but as I have a hearing impediment and I am particularly slow at typing and make multiple spelling errors I decided to use a private transcribing company that have appropriate levels of confidentiality and security to undertake verbatim transcriptions of the audio files of the interviews. The transcription software also allowed each interview to be transcribed within 24 hours of taking place. Following this I word-checked the transcript alongside the audio recording for accuracy with the addition of notations such as pauses and non-verbal utterances. I believe I was able to immerse myself in the data during this phase by re-listening to the audio transcript on numerous occasions whilst noting my thoughts and impressions as recommended by Wengraf.³⁷³ The short time frame between conducting the interview and the transcript production aided in the construction of my reflexive field notes.

3.2.4 Data Analysis

I used the following analytic framework and process suggested by multiple IPA researchers in the literature:^{339,345,374}

3.2.4.1 Familiarisation with the data: Reading and re-reading

During this phase the transcripts were read on numerous occasions at the same time as listening to the digital audio recording, this was followed by multiple reviews of the transcripts without the audio recording in order to immerse myself in the data. Notes were taken during each visit focusing on the content, the language used and any free text analysis.

3.2.4.2 Descriptive coding

A printed version of the transcript was formatted to include wide margins to allow for space to commence coding. Using the right-hand margin descriptive codes/explanatory comments were documented focusing on the content (what was said), the linguistic use (how it was said) and conceptual annotations (interpretations of, or questions about, what was meant by the participant). (See Figure 3-6)

-ve → +ve

But I do actually think that I took a lot of...or...as many now in hindsight, probably once, I probably processed it as many positive factors (erm) from it as I didn't like that sort of balance that short term negative factors, if that makes sense.

DK 01:43
Yeah. Okay. So just started, you said. So first, you just describe the assessment, which one was it?

Paul 01:51
And so it was, it was the neurology module in year two so 202. I can't remember the exact title, but it's basically neuro neuroscience, and things like that.

DK 02:05
Was it written or a practical,

Paul 02:09
written, written assessment?

DK 02:12
Why did you pick that one?

02:13
(erm) I think it's because it's like, yeah...the one that I...I failed. (erm) And like I said, it's one that sort of stuck with me. Almost like, I, one of the outcomes, I say, it's been a little bit of a chip on my shoulder. (erm, pause) And, yeah, I think as I sort of matured, I got through the course, it was actually one that I realized, I learned a lot (erm) from (erm) just the process of failing, in a sense, and coming to terms with (erm) failing and sort of how to turn something that's inherently quite negative, into like, a positive learning point for me.

DK 02:54
And how did you go about doing that?

Paul 02:55
err I think time (erm). And I mean, I...I think it began sort of when I was revising for the resits, and sort of that...like I mean, I lost practically my entire summer, because I was revising for a resit. And just with that little voice in the back of my head saying, if you don't pass this, your...your your OUT (emphasised) and that I said by this, I'm not going to leave myself with in an awkward...like, I'm

hindsight - time to process
Neuro → +ve
short term negative - how long?

Negative impact on sense of self
Time as healer
Chip on the fairness of failure
Transformative nature of failure -ve → +ve

Practical impact of failure
impact of failure on future

- chose a failed one - impact on self
- chip on shoulder
- negative feelings
- in industry confidence?
- failure is a process
- failure does learning

- loss of summer - not clear who feels we do it? seen as punishment
- Realisation of impact of failure on future hopes / dreams
- Sense of Control, I can push the effort to pass

- 2 - Transcribed by <https://otter.ai>

Figure 3-7. Interview transcript with exploratory comments in the right-hand margin and emerging themes in the left-hand margin

3.2.4.3 Interpretative coding

In the left-hand column interpretative codes representing emergent themes were documented in attempts to reflect the essence of what was being described in the narrative in concise phrases.

3.2.4.4 Connections between themes

Each emergent theme was typed into a Microsoft Excel (2016) worksheet with the corresponding line number from the interview. This was initially documented in chronological order (the order in which the participant discussed it in the narrative). The emergent themes were then moved into clusters of related themes. Patterns between emergent themes through the process of abstraction and subsumption helped formulate 'super ordinate' themes; for example, the theme 'negative emotions of failure' encapsulated descriptions of embarrassment, shame, anger, frustration and sadness. This was done for each individual interview and compared to the emergent themes formulated by my supervisor to check for consistency.

3.2.4.5 The next case

Once the emergent themes had been documented and clustered into superordinate themes I moved onto the next participant's transcript. In keeping with IPA's theoretical stance I attempted to bracket the emergent ideas from the prior interviews in order to allow new themes to emerge. IPA researchers acknowledge this is challenging as the researcher is changed by the findings from earlier participants.³³⁹ However, I took a methodical and structured approach by followed the same steps described above for each participant.

3.2.4.6 Patterns across cases

The process in IPA is effectively a case series in which idiographic analysis is followed by analysis of common and divergent themes within the homogeneous sample. I utilized two techniques to identify similarities and differences between themes across cases. The first approach involved printing out the descriptive codes from each of the interviews to cluster the codes under the same concise umbrella term and highlight how frequently these themes recurred between participants (see Figure 3-7). Within each interview I used a highlighter to colour code individual codes into emergent conceptual themes, for example in Figure 3-8 the orange highlighted sections under the

theme 'failure' were amalgamated into a superordinate conceptual theme named 'the negative impact of failure' whilst the code highlighted in yellow became part of a theme named 'failure as the catalyst for change'.

<p>Descriptive codes</p> <p>Assessment:</p> <ul style="list-style-type: none"> • Formatives <ul style="list-style-type: none"> ○ Less important = less effort (1,2, 4, 5, 6, 7) (8 and 3 = approach them the same) ○ No benefit/detrimental (1, 6) ○ Beneficial – identify weaknesses/gauge of knowledge (2, 4, 1(but came later)) ○ Less stressful = better performance (4, 7, 8) • OSCE harder than written (2, 3, 4) <ul style="list-style-type: none"> ○ Written = controlled environment (2) ○ OSCE = artificial (4, 5, 6) • OSCE = easier (6, 7) <ul style="list-style-type: none"> ○ Immediate feedback/gauge performance (6) • Revision is stressful/emotional rollercoaster (2, 3) • Loss of purpose after exams (2) • SJT = weird assessment (2) • Reflecting on experience = difficult (3) • Missing the point of individual assessment = rejects outcome (3) • Too many/tick box (3) • Would prefer multiple mini assessments (5, 7) • Assessments aren't standardised across med schools = unfair (4) • CBD = hard (3, 5) <ul style="list-style-type: none"> ○ Subjective (5) ○ Take confrontational approach (3) • Assessments are artificial/unfair (4, 5) • Assessment type impacts outcome (6) • Students defined by numbers (6) <p>Curriculum</p> <ul style="list-style-type: none"> • Clinical > preclinical (1, 2, 3, 6, 8) <ul style="list-style-type: none"> ○ Clinical = real, motivating (1, 3, 4, 6, 7, 8) ○ Preclinical = hurdle/not relevant, -ve motivator (1, 6, 7,8) ○ Preclinical = easier (4, 5,) ○ Preclinical harder than clinical (6, 7) • Not flexible for WP (3) <ul style="list-style-type: none"> ○ 9-5 lectures impacts ability to work to finance course (3) ○ Clinical rotations less time to earn (3, 8) • Curriculum not revolutionary <ul style="list-style-type: none"> ○ Designed for career development of academics not for students (3) ○ Students do all the work, educators get the praise (3) <p>Environment</p> <ul style="list-style-type: none"> • Fitted in (1, 5, 6, 7, 8) • Socialising as difficult (2, 3, 4) 	<ul style="list-style-type: none"> ○ Socialising easier in Clinical years (2) ○ 1st year particularly difficult/isolated (2) ○ No interest in societies (2) ○ Friendships = passive no effort to upkeep (2) ○ Being a grad is a barrier (3) ○ Drinking culture as a potential barrier (1, 5, 8) <ul style="list-style-type: none"> • Socialising is necessary to have better relationships in medicine (7) • ACCESS course provided friendship group prior to starting (8) • Pressure to socialise <ul style="list-style-type: none"> ○ Barrier to work (4, 7, 8) ○ Pressure on finances (7) ○ COVID was protective (4, 7) • BSMS identity = <ul style="list-style-type: none"> ○ positive/holistic (1) ○ Focuses on communication skills (1) ○ Small = +ve (1, 2, 8) ○ Friendly (1, 2, 7, 8) ○ Diverse (8) • BSMS Supportive learning environment (1) • Socialises with like-minded people (4, 6, 7) <ul style="list-style-type: none"> ○ Other grads (6) ○ Not with high achievers (6) • Medics as cliquy (2, 8) • BSMS = competitive/ambitious (3, 5, 6, 7) • BSMS less competitive than other med schools (4) • Difficult to escape the medic bubble/isolated from other students (1, 5) • Nothing is secret (1) • Racism <ul style="list-style-type: none"> ○ Prevalent (3, 4) ○ Barrier to socialising (although isolated to 1 year group) (4) ○ Not discussed /dealt with by med school (3) ○ BSMS has tried to combat racism/become more inclusive (4, 7) ○ Normative culture of privilege (3) ○ BSMS accepting of discrimination (3) ○ Clinical performance more important than racism (3) <p>External contributors</p> <ul style="list-style-type: none"> • External commitments (1, 3, 7, 8) • Transition to uni life (7) • Mental health issues (2, 3, 4, 6, 7, 8) <ul style="list-style-type: none"> ○ Physical symptoms of stress (2, 3) ○ MH crisis led to change (2) ○ Affects ability to study (2, 3, 4, 6, 7) ○ Good vs bad days (2) ○ Substance Abuse (2) ○ Difficulty asking for help (4)
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Figure 3-8. Descriptive codes, the numbers attached to the codes indicate which interview the code was present in.

	Academic tutor - check in and sign offs, career advice (tick box), as	411-426
	Academic tutor role - Wants more career advice	440-444
	Wanted support earlier	498-506
	Want a separate process for academic support from student support	507-508
	Academic and student support seen as separate	538-542
	Student support are available, experiecnes and helpful	568-570
	Barrier to student support = lack of medical background and share	573-578
Motivation	Re-sit year - fresh start, increased motivation	170-171
	Considered quitting	247-250
	Science and helping people	742-745
	Medicine offers variety of future options/stable career	745-748
	Lose original motivation at medical school = like a conveyor belt	749-751
	Failure decreased motivation	751-763
	Percieved control over how to get though increases motivation - a	769-777
	Feeling he can fulfil the role of a doctor increases his motivation	775-776
	positive feedback (esp from clinicians) increases enjoyment increa	787-797
Feedback	Immediate -ve feedback not taken in as not in correct mental spac	151-159
	Doesn't take in feedback if fails (whats the point?)	151-154
	Written feedback after is limited as can remember what happenec	156-157
	actionable feedback as beneficial	278-281
	OSCE feedback too minimal to be useful to impact change in pract	1130-1139
	Want more detailed feedback (rewatch the OSCE)	1138-1142
	Writtens - no feedback traditionally	1143
	Covid benefits - Online writtens now received breakdown by subje	1144-1154
	Want to review their own exam scripts - blocked by med school	1156-1170
Failure	Multiple failures (feels this is unique)	28-29
	Expected to pass (self/others)/surprised by failure	53-55
	negative emotions of failure (down and annoyed)	64-66
	Coped with failure badly	95-99
	Didn't talk to anyone/internalised	96-99
	Externalising failure - bad luck/nerves/wrong case	103-105
	Failure led to change (got help earlier/found a case earlier/differer	165
	Had to re-sit the year, annoyed with himself	166-170
	Process of failure = intimidating	457-489
	Fear of being kicked off the course	467
	Failure = stigma	487
Ranking	Increaes competitiveness	907-912
	Students are fixated on it	909-912
	Not bothered- more important things to stress about	912-915
	Improtant for chocie of were to work in future	915-916
	Older peers experienes shown ranking isnt as improtant due to S	918-923
	Positive motivator - makes him want to do better	950-953

Figure 3-9. Colour coding of an individual cases codes as they begin to be linked to conceptual codes.

The second approach I took was to recode the transcripts within NVivo software, version 12. I found this method made the participants' narratives more accessible for the write up of the analysis and provided an alternate way in which to visualize the codes.

In order to develop a deeper and richer analysis of the data I undertook a number of exercises to develop the conceptual codes. These involved creating a distance from the transcripts and the descriptive codes to document the essence of each individuals' narrative and the central themes within each. This was achieved by taking a step back from the data and formulating conceptual titles that encompassed the central components to each participants' narrative and documenting them from memory. This was done for each case in turn before repeating the process across cases. This helped develop the meta-themes that traversed the narratives such as the 'duality and contradictory' desires of participants with regards to the frequency of assessment, the degree of independence they are afforded and the amount of support they are offered. A further exercise involved comparing and contrasting the emergent conceptual themes from the study with the findings from my scoping review and the wider literature around academic struggle. This allowed me to identify where the emergent themes added strength to prior findings, identify where the findings deviated from prior studies as well as highlighting the novel findings.

The analysis will be presented by introducing the major emergent themes which consist of subthemes. Illustrative participants' quotes will be provided to support and justify the explanations and interpretations within the subthemes.

4 Early assessment predictors of academic performance: A retrospective cohort study

4.1 Objectives

- To investigate whether sociodemographic, and/or entry criteria predict success at medical school.
- To identify which assessments predict ongoing academic underperformance.
- To inform the qualitative exploration of the student narrative around medical school experience of teaching and learning in academically struggling students.

In this analysis the outcome variable being used as a surrogate for academic underperformance are students who placed in the lower three deciles of assessment ranking at the end of third year exams. The year three objective structured clinical examination (OSCE), the written exam in module 302 and the knowledge test (KT) at the end of the year formed the decile ranking delivered at the end of third year which is the outcome variable in this study.

4.2 Study population

The retrospective cohort analysis included all 637 students at Brighton and Sussex Medical School (BSMS) who had enrolled between 2013-2017. Table 4-1 displays the demographic details for the entire cohort. The mean age at enrolment of the cohort was 20.5 years, with a median age of 19 and a range from 17 to 52 years. The majority of students were female, accounting for 60.1% of the cohort.

The majority of students self-identified as White (62.3%), with 16.2% identifying as South-Asian, 7.7% as Black African and Black Afro-Caribbean or mixed heritage, 5.7% as South East Asian or Chinese ethnicity, 2.7% as Arabic ethnicity and 5.5 % of students who identified as 'other' without specifying or preferred not to say.

The majority of students (64.2%) entered medical school directly after completion of their A-levels. 20.9% were postgraduates from UK-based universities, 6.9% had completed the International Baccalaureate, 3% had utilised the Access course, 1.1% had completed degrees in a non-UK

institution, and 3.9% made up the remainder which included foundation degrees, diplomas in higher education, postgrad certificates in education, undergraduate credits or qualifications that were unknown or did not meet the above criteria.

Almost a third of students identified themselves as having a disability prior to commencing the course (30%). Of those, 36.1% were diagnosed with a learning disability (including dyslexia/autism spectrum disorder/attention deficit hyperactivity disorder), 34% with a mental health condition, 0.03% with sensory disability (including blindness/partial sightedness and hearing impairments) and 27% were coded as 'other' or non-visible (e.g. diabetes/epilepsy).

Table 4-1 BSMS cohort demographic characteristics

Variable		N (%)
Median (IQR) Age at enrolment		19 (18-21)
Age Range		17-52
Age group:	17-20	457 (71.7)
	21-29	152 (23.9)
	≥30	28 (4.4)
Gender:	Female	382 (60.1)
	Male	254 (39.9)
Ethnicity	White	396 (62.3)
	South Asian	103 (16.2)
	Black	49 (7.7)
	South East	36 (5.7)
	Asian/Chinese	17 (2.7)
	Arab	35 (5.5)
	Other	35 (5.5)
Entry pathway	A-levels	408 (64.2)
	Postgraduate entry	133 (20.9)
	International Baccalaureate	44 (6.9)
	Access Course	19 (2.99)
	Non UK degree	7 (1.1)
	Other	25 (3.93)
Disclosed Disabilities	Learning	69 (36.1)
	Mental health conditions	65 (34.0)
	Sensory	6 (0.03)
	Other/non-visible	51 (26.7)

4.2.1 Demographic comparison with HESA database

Our cohort data demographics are comparable with those held by the Higher Education Statistics Agency (HESA),³⁷⁵ who hold data for all UK based university enrolment which is publicly available. However, there are some notable disparities (see Table 4-2).

Table 4-2 BSMS Study population demographics compared to national medical student population demographic data obtained from HESA

Variable	BSMS (%)	HESA (%)
Gender		
Female	60.1	61.6
Male	39.9	38.2
Age		
<30	95.6	83.3
>30	4.4	16.7
Ethnicity		
White	62.3	56.3
Asian	21.9	27.8
Black	7.7	5.5
Mixed		4.9
Unknown	5.5	5.8
Entry Pathway		
A-Level	64.2	47.3
Postgraduate	20.9	38.3
Disability		
None	70	87.1
Any	30	12.9

Similar to this study, 61.7% of students attending medical school are female and share a similar ethnic minority breakdown as our cohort; 56% of students identify as White compared to 62% in this study, 28% as Asian compared to 22% in this study, 5.5% as Black compared to 7.7% in this study, 5% as mixed and 5.8% as unknown or not disclosed.

However, the student cohort in this BSMS study appears to have a higher proportion of younger students, with 71.7% of students under 21 years old and only 4.4% aged over 30. In comparison, in the academic year 2019/2020, 31% of UK medical students were <20 years old at enrolment, with a further 37.6% aged 21-24, 15.4% aged between 25-29 and 16.7% aged over 30 years old. This may explain the higher percentage of school leavers in this cohort (64%) compared to national statistics in which 47% attend via their A-levels. Postgraduates represent 38% of students who enrol in medicine nationally but were underrepresented in this cohort at 21%. No data were

available regarding international medical students or Access students in the HESA database to compare.

Finally, the prevalence of disclosed disabilities also appears to be much higher in the BSMS study cohort, with around 30% of the students disclosing disabilities compared to 13% in the national database. A further breakdown of the disability categories is unavailable from the national open-access database.

4.3 Univariate Analysis

All data presented in the following section is BSMS data collected between 2013-2017.

4.3.1 Demographic Data

Table 4-3 shows the risk associated with placing in the lower 3 deciles of academic performance at the end of third year with each of the demographic variables.

Table 4-3 Analysis of the association between student demographic characteristics and lower decile placement at the end of third year

	Odds Ratio of placing in lower 3 deciles	95% CI
Age (per additional year of age)	1.09	1.04-1.13
Age range		
<21	ref	
21-29	1.44	0.96-2.16
>30	4.42	2.03-9.63
Gender		
Female	ref	
Male	1.81	1.27- 2.69
Ethnicity		
White	ref	
Non-White	2.71	1.88-3.89
Entry Pathway		
A-Level	ref	
All Non-A-level	1.55	1.08-2.23
Post Graduate	1.52	0.99-2.34
IB	1.38	0.70-2.75
ACCESS	5.65	2.16-14.75
Non UK Graduate	0.82	0.30-2.25
Other	0.55	0.07-4.62
Disability		
No disability	Ref	
Any Disability	1.91	1.32-2.76
Learning	1.62	0.93-2.81
Mental Health	2.61	1.52-4.48
Sensory	0.69	0.08-5.97
Non-visible/other	1.73	0.93-3.22

Bold indicates significant association

4.3.1.1 Age and Gender

Increasing age was associated with an increased likelihood of placing within the lower three deciles at the end of 3rd year, with each year older at enrolment associated with a 9% greater chance of placing in the lower three deciles (OR 1.09, 95% CI 1.04-1.13). Those who commenced the course aged greater than thirty years old had a 4.4 times greater risk of placing in the lower deciles (OR 4.42, 95% CI 2.03-9.63) than students who were less than 21 years of age. There was no statistically significant increased risk for students aged 21-29 years old compared to students who were younger than 21 years old at enrolment.

Male students were almost twice as likely to place in the lower three deciles compared to their female peers (OR 1.81, 95% CI 1.27-2.56).

4.3.1.2 Ethnicity

Within the univariate analysis, ethnicity was strongly linked to placing in the lower deciles, with non-White students almost three times as likely to place in the lower deciles (OR 2.71, 95% CI 1.89-3.89). This association was present across all ethnicity subgroups, with students who identified as being Arab having the highest risk of placing in the lowest deciles with an almost five times risk, although the number of students in this group was low, as indicated by the wide confidence interval (OR 4.82, 95% CI 1.80-12.89). The association between ethnic groups and the risk of placing in the lower deciles was greater for males than females. All students who identified as being Black had an almost three times greater likelihood of placing in the lower deciles than their White peers. The association between being Black and placing in the lower three deciles was only shown for Black male students with an odds ratio of 6.66 (95% CI 2.53-17.50). Black female students having a similar risk of being in the lower three deciles as their white female counterparts (OR 2.08, 95% CI 0.89-4.83). This pattern was repeated for students who identified as South East Asian or Chinese and those who identified as 'other'/preferred not to say. Male and female students of South Asian heritage were over twice as likely to place in the lower deciles (OR 2.20, 95% CI 1.37-3.56) (see Table 4-4). An interaction term between gender and ethnicity was used in subsequent analyses.

4.3.1.3 Entry Pathway

Students who accessed medicine through an alternative pathway other than A-level qualifications had a one-and-a-half times greater chance of placing in the lower deciles at the end of the third year (OR 1.55, 95% CI 1.08-2.23). Despite small numbers students who had been admitted to BSMS through an Access course they were at significantly increased risk of placing in the lower deciles with a greater five times risk (OR 5.65 95% CI 2.16-14.75). There was no evidence of an association between graduate entry and decile placement.

4.3.1.4 Presence of a Disability

The presence of any prior disclosed disability was associated with an almost double (OR 1.91, 95% CI 1.32-2.76) chance of falling in the lower three deciles. This was predominantly driven by those who identified as having a mental health disorder which correlated with a two-and-a-half times increased risk (OR 2.61, 95% CI 1.52-4.48). There was no evidence of differential attainment based on the other disabilities in this univariate analysis.

Table 4-4. Analysis of the association between ethnicity and gender and lower decile placement at the end of third year

	Odds Ratio of placing in lower 3 deciles	95% CI	p for interaction
All White			
Female	ref		
Male	1.39	0.83-2.33	0.21
All South Asian	2.20	1.37-3.56	<0.01
Male	2.57	1.31-5.04	
Female	2.42	1.26-4.65	
All Black	2.95	1.58-5.50	<0.01
Male	6.66	2.53-17.50	
Female	2.08	0.89-4.83	
All South East Asian/Chinese	3.06	1.51-6.21	<0.01
Male	6.46	2.13-19.53	
Female	2.26	0.87-5.87	
All Arab	4.82	1.80-12.89	<0.01
Male	5.65	1.81-17.62	
Female	4.84	0.66-35.30	
Other	2.85	1.39-5.87	<0.01
Male	5.59	2.31-15.12	
Female	1.21	0.328-4.468	
Bold indicates significant association			
All ethnic groups' were compared to 'All White' students as the reference group			
Gender breakdown was compared to White women as the reference group			

4.3.2 Assessment Data - BSMS intakes 2013-2017

The assessment breakdown throughout the period of analysis is found in Appendix C.

4.3.2.1 Assessments in Year One

Year one is split into four modules, one of which (module 101) traverses the whole year (see Figure 3-1). Each module requires a minimum of 80% attendance at monitored sessions. A summative OSCE at the end of year one was converted to a formative assessment in 2015. Module 101 consisted of a portfolio score and a family study assignment. Module 102 comprised a knowledge test of 110 single best answer (SBA) questions and a module essay. Module 103 included a composite score for the five module tutorial tests, a student selected module and a knowledge test comprising 40 SBAs and 20 short answer questions (SAQs). Module 104 included four module tutorial tests, a student selected component (SSC) and a knowledge test combining SBAs and SAQs.

Only 41.6% of (265/637) students in this retrospective cohort analysis had taken the OSCE in year one. The mean score was 84.9%, with a range of 70.8-95.7% (sd. 4.55) (see Table 4-5). Assessment and attendance failure were uncommon in year one, ranging from 0.2% to 9.1% of the cohort in any individual assessment. The low failure rates impacted whether failure in individual assessments was associated with academic performance in year three. However, lower scores in almost all assessments throughout year one were associated with worse performance in year three. Table 4-5 summarises the descriptive analysis of the assessments in year one and Table 4-6 summarises the association between year one assessments and decile placement in year three.

4.3.2.2 Module 101

4.3.2.2.1 Attendance

Only one student failed to attend sufficient sessions during module 101 and two students failed to attend the primary care sessions, none of these students placed in the lower three deciles at the end of third year (see Table 4-5).

4.3.2.2.2 Assessment

Portfolio scores were collated throughout the year, with an overall binary pass or fail grade provided if the overall portfolio score was <50%. Portfolio scores ranged from 40.1-73.5% with a mean of 59.1% (sd. 3.79) (see Table 4-5). Portfolio scores this early in the course were already predictive of 3rd-year decile placement, with a 9% decreased chance that a student would place in

the lower 30% at the end of 3rd year for each percent point higher they received in their portfolio score (OR 0.91, 95% CI 0.86-0.95, see Table 4-6). The overall grade was not significantly associated with future outcomes but may reflect the low failure rate (0.3%).

The Family study assessment score was based on a report of their experience with a family with a new baby. The range of scores was 36-88% with a mean of 60.3% (sd. 7.36) (see Table 4-5), and showed a higher score was protective, but with a weaker association, against placement in the lower 30% of 3rd year by 3.4% per each percentage point higher obtained in the assessment (OR 0.966, 95% CI 0.94-0.99, see Table 4-6). Failure of this assessment (3.5% of the cohort) was not significantly associated with placing in the lower three deciles at the end of the third year. Thirty students (4.7%) failed the overall module (OMG – Overall Module Grade), which was not associated with decile outcome in year three assessments.

4.3.2.3 Module 102

4.3.2.3.1 Attendance

Only three students (0.5%) failed to attend the required sessions in Module 102 which did not predict decile performance at the end of third year.

4.3.2.3.2 Assessment

Eight students failed the academic skills assessment, which did not predict decile performance at the end of the third year. Despite a low failure rate (2.5%), failure of the module essay increased the risk of students placing in the lower three deciles in the third year by almost five times (OR 4.92, 95% CI 1.76-13.74, see Table 4-6).

Scores in the knowledge test ranged from 35.7-93.9%, with a mean score of 71.9% (Sd. 9.95). Higher scores were significantly associated with a lower likelihood of placing in the lower deciles in the third year, with an 8% reduced risk for each higher percentage point achieved (OR 0.92, 95% CI 0.90-0.94, see Table 4-6). Twenty students (3.1%) failed the assessment, but this did not reach statistical significance for decile outcome in third year assessments.

Failure of the module itself (5.3% of the cohort), which encompassed failure of any of the above assessments, tripled the risk of placing in the lower three deciles in the third year (OR 3.40, 95% CI 1.69-6.83, see Table 4-6).

4.3.2.4 Module 103

4.3.2.4.1 Attendance

Module attendance failure was rare (0.9%) and was not associated with decile outcome in year three.

4.3.2.4.2 Assessment

Failure of the SSC was also rare (0.6%) and did not correlate with decile outcome at the end of year three. The remainder of the assessments were all positively associated with placing in the lower three deciles at the end of the third year. The module tutorial tests scores ranged from 34.5%-98.3% with a mean score of 72.7% (sd. 12.6). Fifty-three students (8.3%) failed the module tutorial tests, and this was associated with a four-fold increased risk of placing in the lower deciles in the third year (OR 4.21, 95% CI 2.37-7.48, see Table 4-6). Each percentage point scored in the module tutorial tests reducing the risk by around 6% (OR 0.94, 95% CI 0.93-0.96, see Table 4-6).

The knowledge test comprised the results from the SBAs (40 questions) and the SAQs (20 questions). Failure of the knowledge test correlated with a six-and-a-half time increased chance of placing the lower deciles at the end of the third year (OR 6.57, 95% CI 2.00-21.62, see Table 4-6). KT scores ranged from 48.8%-97.6% with a mean of 68.9% (sd. 9.5). Each percentage point scored was associated with an 11% decrease chance of placing in the lower deciles in the third year (OR 0.89, 95%CI 0.87-0.91, see Table 4-6). The SBA scores ranged from 32.5%-100% with a mean of 71.8% (sd. 11.35), and the SAQ ranged from 39-96% with a mean of 68% (sd. 10.05). The SAQ scores were more predictive, with each percentile point scored associated with an 11% (OR 0.89, 95% CI 0.87-0.91, see Table 4-6) reduced risk compared to each percentile point of the SBA reducing the risk by 7% (OR 0.93, 95% CI 0.91-0.96, see Table 4-6).

Module failure happened to 3.6% of students, which encompassed failure in attendance of the module, the SSC or the KT and increased the chances of those students falling in the lower deciles in the third year by over three (OR 3.20, 95% CI 1.38-7.39, see Table 4-6).

4.3.2.5 Module 104

4.3.2.5.1 Attendance

Module attendance failure occurred in 1.1% of the cohort and was not associated with decile placement.

4.3.2.5.2 Assessment

Failure of the SSC was not statistically associated with a greater risk of placing in the lower deciles of the third year, with a failure rate of 1.4%. The module tutorial tests (MTT) were once again significantly associated with lower decile placement in the third year, with the 58 students who failed (9.1%) facing a greater than seven-fold risk of placing in the lower deciles in the third year (OR 7.16, 95% CI 4.00-12.82, see Table 4-6). The scores ranged from 29.2%-100% with a mean score of 74.8% (sd. 13.56), with each percentile point scored reducing the risk of lower three decile placement in the third year by almost 6% (OR 0.94, 95% CI 0.93-0.96, see Table 4-6).

The knowledge test score amalgamates the SBA, SAQ and MTT in a 55:35:10 split. All eight students (1.3%) who failed the knowledge test in module 104 placed in the lower three deciles in the third year. The KT scores ranged from 50-94.4%, with a mean of 71.4% (sd. 8.19). Each percentage point attained reduced the risk of placing in these lower deciles by 13% (OR 0.87, 95% CI 0.85-0.90, see Table 4-6). The SBA scores ranged from 40-100% with a mean of 74.2% (sd. 10.09), and the SAQ scores ranged from 39-94.5% with a mean of 70.72% (sd. 8.80). Each percentage point scored in the SAQ and SBA predicted an 11% (OR 0.89, 95% CI 0.87-0.91, see Table 4-6) and 9% (OR 0.91, 95% CI 0.89-0.93, see Table 4-6) reduced risk of lower decile placement in the third year respectively. Nineteen students failed the module (3%), which predicted a greater than eight times risk of lower decile placement in the third year. (OR 8.44, 95% CI 2.99-23.80, see Table 4-6).

Table 4-5: Descriptive analysis of Year 1 assessments

Variable	Mean %	Range %	Standard deviation	Number of failures (%)
Year 1				
OSCE Score	84.9	70.8-95.7	4.55	
OSCE grade	-	-	-	3(1.1%)
Module 101				
Attendance	-	-	-	1(0.2%)
Attendance primary care	-	-	-	2(0.3%)
Portfolio score	59.1	40.1-73.5	3.79	
Portfolio grade	-	-	-	2(0.3%)
Family study score	60.3	36-88	7.36	
Family study grade	-	-	-	22 (3.5%)
OMG	-	-	-	30 (4.7%)
Module 102				
Attendance	-	-	-	3 (0.5%)
Academic skills grade	-	-	-	8 (1.3%)
Module Essay Grade	-	-	-	16 (2.5%)
KT score	71.9	35.7-93.9	9.95	
KT grade	-	-	-	20 (3.1%)
OMG	-	-	-	34 (5.3%)
Module 103				
Attendance	-	-	-	6 (0.9%)
SSC Grade	-	-	-	4 (0.6%)
Module tutorial test score	72.7	34.5-98.3	12.6	
Module tutorial test grade	-	-	-	53 (8.3%)
SBA	71.8	32.5-100	11.35	
SAQ	68	39-96	10.05	
KT score	68.9	48.8-97.6	9.5	
KT grade	-	-	-	13 (2%)
Overall score 103	69.8	42.4-97.6	9.73	
OMG	-	-	-	23 (3.6%)
Module 104				
Attendance	-	-	-	7 (1.1%)
SSC grade	-	-	-	9 (1.4%)
Module tutorial test score	74.8	29.2-100	13.56	
Module tutorial test grade	-	-	-	58 (9.1%)
SBA	74.2	40-100	10.09	
SAQ	70.72	39-94.5	8.8	
KT score	71.4	50-94.4	8.19	
KT grade	-	-	-	8 (1.3%)
Overall score	72.3	42.4-95.9	9.59	
OMG	-	-	-	19 (3%)
OMG - Overall Module Grade				

Table 4-6. Analysis of the association between year 1 assessments and lower decile placement at the end of year 3

Variable	Odds Ratio of placing in lower 3 deciles	95% CI
OSCE Score	0.88	0.82-0.93
OSCE grade	5.38	0.48-60.26
Module 101		
Portfolio score	0.91	0.86-0.95
Portfolio grade	2.80	0.17-45.06
Family study score	0.97	0.94-0.99
Family study grade	1.63	0.67-3.95
OMG	1.66	0.77-3.56
Module 102		
Attendance	5.64	0.51-62.59
Academic skills grade	2.85	0.71-11.54
Module Essay Grade	4.92	1.76-13.74
KT score	0.92	0.90-0.94
KT grade	2.37	0.97-5.83
OMG	3.40	1.69-6.83
Module 103		
Attendance	1.94	0.25-7.70
SSC Grade	2.81	0.39-20.09
Module tutorial test score	0.94	0.93-0.96
Module tutorial test grade	4.21	2.37-7.48
SBA	0.93	0.91-0.95
SAQ	0.89	0.87-0.91
KT score	0.89	0.87-0.91
KT grade	6.57	2.00-21.62
Overall score 103	0.89	0.87-0.91
OMG	3.20	1.38-7.39
Module 104		
Attendance	2.11	0.47-9.54
SSC grade	3.57	0.95-13.44
Module tutorial test score	0.94	0.93-0.96
Module tutorial test grade	7.16	4.00-12.82
SBA	0.91	0.89-0.93
SAQ	0.89	0.87-0.91
KT score	0.87	0.85-0.90
Overall score	0.88	0.86-0.90
OMG	8.44	2.99-23.80

Bold indicates significant association

4.3.2.6 Assessments in Year Two

Year two consists of four modules. Each module requires a minimum of 80% attendance at monitored sessions. Module 201 runs parallel to the other three modules throughout the year (see Figure 3-1) and consists of a portfolio score and grade, an amalgamation of scores from a mixture of six reflective and knowledge based assignments. There was also a patient study essay on the impact on the individual, family and society of a chronic condition and an OSCE consisting of 16 stations at the end of the year. Module 202 consisted of an SSC, a knowledge test combining SBAs and SAQs and completing two case study assessments (CSA) which were multiple choice questions covering material studied in the module tutorials. The SBAs, SAQs and CSA contributed to the OMG in a 55:35:10 ratio. Module 203 assessment included an SSC, the creation of a patient information leaflet, and a knowledge test in the format of SBAs only. Module 204 consisted of an SSC, a scientific research poster presentation and a knowledge test of SBAs. Table 4-7 summarises the descriptive analysis of the assessments in year two, and Table 4-8 summarises the association between year 2 assessments and decile placement in year three.

4.3.2.7 Module 201

4.3.2.7.1 Attendance

Eleven students failed to attend the requisite amount of session in module 201 but this did not predict decile outcome. Whereas all three students who failed to attend the required primary care sessions in year two placed in the lower three deciles at the end of third year.

4.3.2.7.2 Assessment

The portfolio and patient study were both associated with decile performance in year three; failure in the portfolio was associated with a 3.7 times increase risk (OR 3.74, 95% CI 1.37-10.20, see Table 4-8) of low decile placement. Each percentage point scored was associated with a 6% reduced risk (OR 0.94, 95% CI 0.91-0.97, see Table 4-8) of lower decile placement. Failure in the patient study component doubled the risk of placement in the lower deciles (OR 2.20, 95% CI 1.10-4.41, see Table 4-8), with each percentile point gained reducing the risk by 4% (OR 0.96, 95% CI 0.94-0.98, see Table 4-8). Failure of either of these components led to the failure of the module,

which almost trebled the risk of lower decile placement in year three (OR 2.95, 95% CI 1.81-4.79, see Table 4-8).

Failure in the OSCE in year two more than doubled (OR 2.37, 95% CI 1.42-9.40, see Table 4-8) the chance of students placing in the lower deciles in year three despite a low failure rate of 2.8%, with each percent point obtained reducing the risk by 10% (OR 0.90, 95% CI 0.87-0.93, see Table 4-8). The scores in the OSCE ranged from 58.9-93%, with a mean of 79.9% (sd. 5.7).

4.3.2.8 Module 202

4.3.2.8.1 Attendance

Attendance failure in this module did not predict decile outcome in year three with a failure rate of 0.6%.

4.3.2.8.2 Assessment

Failing the SSC was rare; all three who failed placed in the lower three deciles in the third year. Performance in the case studies was associated with decile outcome in year three, with each percentage point obtained conferring an 8% reduced risk (OR 0.92, 95% CI 0.90-0.94, see Table 4-8). The scores ranged from 55-100% with a mean of 80.6% (sd. 8.99), with only two students failing the assessment, and this did not reach statistical significance.

Similar to year one, the knowledge tests which combined the SBA and SAQ results were significant predictors of academic performance in year 3. Scores ranged from 48-97%, with a mean of 70.2% (sd. 10.32). Failure of the knowledge test (23 students, 3.6%) accompanied a five and a half times greater likelihood of lower decile placement (OR 5.65, 95% CI 2.35-13.58, see Table 4-8) with an associated almost 11% reduced risk per percentile point obtained (OR 0.89, 95% CI 0.87-0.91, see Table 4-8). Regarding the individual components, the SBA scores ranged from 40-97.5% with a mean of 75.1% (sd. 10.5), with each percentile point obtained conferring an 8% reduction in risk (OR 0.92% CI 0.90-0.94, see Table 4-8) and the SAQ ranged from 29-97% with a mean of 66.7% (sd. 12.04) with each percentile appoint associated with a 9% reduced risk (OR 0.91, 95% CI 0.90-0.92, see Table 4-8). The module was failed by 5.5% of the cohort, which quadrupled the risk of placing in the lower deciles in the third year (OR 4.09, 95% CI 2.04-8.19).

4.3.2.9 Module 203

4.3.2.9.1 Attendance

All three students who failed to attend the requisite amount of session in module 203 placed in the lower three deciles at the end of third year.

4.3.2.9.2 Assessment

Neither failure of the SSC nor production of a patient information leaflet were independently associated with decile placement in year three, with failure rates of 1.1% and 4.7%, respectively. Only eight students failed the knowledge test, but this was associated with an increased risk of placing in the lower three deciles by a factor of 7, although the confidence intervals were wide, limiting the inference of these findings (OR 7.16, 95% CI 1.38-37.28, see Table 4-8). Student scores for this assessment ranged from 47.4-94.6% with a mean of 75.2% (sd. 9.01), with each percentile point obtained in the assessment decreasing the risk by 15% (OR 0.85, 95% CI 0.83-0.88, see Table 4-8). Failure of the module (46 students, 7.2%) was associated with a two-and-a-half time increased risk of lower decile placement in year three (OR 2.54, 95% CI 1.38-4.67, see Table 4-8).

4.3.2.10 Module 204

4.3.2.10.1 Attendance

The nine students who failed to attend the required sessions in module 204 showed an association with placing in the lower three deciles at the end of third year although once again the wide confidence intervals need to be taken into account (OR 5.75, 95% CI 1.42-23.27, see Table 4-8).

4.3.2.10.2 Assessment

Only four students (0.6%) and three (0.5%) failed the SSC and poster presentation assessment respectively, with neither predicting the decile outcome in year three. Eight percent of students failed the knowledge test, which increased the risk of placing in the lower deciles in the third year by a factor of 13 (OR 13.01, 95% CI 6.49-26.08, see Table 4-8). The knowledge test scores ranged from 21.8-96.9%, with a mean of 70.1% (sd. 12.08). Each percentile point attained in the assessment was associated with a 13% reduced risk of decile placement in year three (OR 0.87,

95% CI 0.85-0.89, see Table 4-8). Overall failure of the module (61 students, 9.6%) was associated with a ten fold increased risk of placing in the lower deciles (OR 10.358, 95% CI 5.66-18.96, see Table 4-8).

Table 4-7: Descriptive analysis of Year 2 assessments

Variable	Mean %	Range %	Standard deviation	Number of failures (%)
OSCE score	79.9	58.9-93	5.7	
OSCE grade				18 (2.8%)
Module 201				
Attendance				11 (1.7%)
Attendance primary care				3 (0.5%)
Portfolio Score	61.1	28.8-90	7.36	
Portfolio Grade				16 (2.5%)
Patient study score	63	12-100	11.02	
Patient study grade				35 (5.5%)
OMG				78 (12.2%)
Module 202				
Attendance				4 (0.6%)
SSC Grade				2 (0.3%)
Case studies score	80.6	55-100	8.99	
Case studies grade				2 (0.3%)
SBA	75.1	40-97.5	10.5	
SAQ	66.7	29-97	12.04	
KT score	70.2	48-97	10.32	
KT grade				23 (3.6%)
Overall score	70.9	6.7-97.1	10.5	
OMG				35 (5.5%)
Module 203				
Attendance				3 (0.5%)
SSC grade				7 (1.1%)
Pt info leaflet grade				30 (4.7%)
KT score	75.2	47.4-94.6	9.01	
KT grade				7 (1.1%)
OMG				46 (7.2%)
Module 204				
Attendance				9 (1.4%)
SSC Grade				4 (0.6%)
Poster grade				3 (0.5%)
KT score	70.1	21.8-96.9	12.08	
KT grade				51 (8%)
OMG				61 (9.6%)

Table 4-8: Analysis of the association between year 2 assessments and lower decile placement at the end of third year

Variable	Odds Ratio of placing in lower 3 deciles	95% CI
OSCE score	0.90	0.87-0.93
OSCE grade	3.65	1.42-9.40
Module 201		
Attendance	2.37	0.71-7.86
Portfolio Score	0.94	0.91-0.97
Portfolio Grade	3.74	1.37-10.20
Patient study score	0.96	0.94-0.98
Patient study grade	2.20	1.10-4.41
OMG	2.95	1.81-4.79
Module 202		
Attendance	0.93	0.96-9.00
Case studies score	0.92	0.89-0.94
Case studies grade	2.80	0.17-45.06
SBA	0.92	0.90-0.94
SAQ	0.91	0.89-0.92
KT score	0.89	0.87-0.91
KT grade	5.65	2.35-13.58
Overall score	0.89	0.87-0.91
OMG	4.09	2.04-8.19
Module 203		
SSC grade	2.11	0.47-9.54
Pt info leaflet grade	1.66	0.77-3.56
KT score	0.85	0.83-0.88
KT grade	7.16	1.38-37.28
OMG	2.54	1.38-4.67
Module 204		
Attendance	5.75	1.42-23.27
SSC Grade	8.51	0.88-82.37
Poster grade	1.40	0.13-15.52
KT score	0.87	0.85-0.89
KT grade	13.01	6.49-26.08
OMG	10.36	5.66-18.96

Bold indicates significant association

4.3.2.11 Assessments in Year Three

Year three consisted of seven modules. Each module requires a minimum of 80% attendance at monitored sessions. Module 301 assessments include a logbook of competencies signed off for completion. To pass module 302, students had to complete three research methods essays and a written exam of SAQs. Module 303, 304 and 306 included Case Based Discussion (CbD)

assessments and the completion of their logbook competencies. Module 307 included two SSC scores and grades, and module 308 included a pharmacology and therapeutics assessment. The time for dementia assessment grade was delivered at the completion of a longitudinal placement that traversed years two and three and did not sit within a specific module. All students sat the OSCE and knowledge test made up of SBAs at the end of the year.

The OSCE, the written exam in module 302 and the knowledge test at the end of the year formed the decile ranking delivered at the end of the third year, which is the outcome variable in this study. Only three students in the cohort failed the time for dementia assessment, which conferred no predictive value to the end-of-year decile placement.

4.3.2.11.1 Module 301

Failure to attend the required sessions was not predictive of decile placement but failure of the overall module (2.7%) inferred an almost seven times greater risk although the wide confidence intervals limit the confidence in the effect estimate of this association (OR 6.96, 95% CI 2.15-22.55, see Table 4-10).

4.3.2.11.2 Module 302

All three essay scores were predictive of final decile placement at the end of the third year. The scores in the first essay ranged from 35-95% with a mean of 74.2% (sd. 11.99), with each percentile point associated with a small two percent decrease risk in decile outcome (OR 0.98, 95% CI 0.97-0.99, see Table 4-10). Essay two scores ranged from 35-100% with a mean of 75% (sd. 11.75), also showing a 2% reduced chance per percentile point obtained (OR 0.98, 95%CI 0.96-0.99, see Table 4-10). The third essay scores ranged from 35-100% with a mean of 73.6% (sd. 12.26), and each percentile point achieved reduced the risk of lower decile placement by 3.5% (OR 0.97, 95% CI 0.950-0.98, see Table 4-10). The combined essay score showed that each percentile scored afforded a 4% reduced risk of lower decile placement (OR 0.96, 95% CI 0.94-0.98, see Table 4-10). The combined essay scores ranged from 35-100% with a mean of 73.9% (sd. 8.64).

4.3.2.11.3 Module 303

All the students passed the logbook in module 303, and therefore this offered no predictive value. 13 students failed the CbD, which did indicate difficulties further on in the year with a greater than six times the risk of placing in the lower deciles (OR 6.21, 95% CI 1.88-20.51, see Table 4-10). The scores in the CbD ranged from 50-70%, with a mean of 53.1% (sd. 7.26). Each percentage score obtained reduced the risk by 12% (OR 0.88, 95% CI 0.82-0.95, see Table 4-10). Failure of the module mirrored the results of failure of the CbDs as no students failed the logbook assessment, and therefore this added no additional predictive value.

4.3.2.11.4 Module 304

Only one student failed to achieve the requisite sign-offs to complete their logbook and placed in the lower decile at the end of the year. Twenty-one students (4.1%) failed the CbDs, which tripled the risk of lower decile placement at the end of the year (OR 3.03, 95% CI 1.26-7.83, see Table 4-10). Scores ranged from 50-70%, with a mean of 54.4% (sd. 8.28). Each percentile point reducing the risk by 17% (OR 0.83, 95% CI 0.75-0.92, see Table 4-10). Due to the low level of failure in the logbook, the failure of the overall module reflected the grade achieved in the CbD, offering no added value.

4.3.2.11.5 Module 306

Only three students failed to achieve the sign-offs to pass the logbook, and all three placed in the lower three deciles. Eleven students failed the elderly care CbD which conferred a 7-factor (OR 7.36, 95% CI 1.93-28.16, see Table 4-10) increased risk of lower decile placement at the end of the year with each percentile point achieved, reducing the risk by 15% (OR 0.85, 95% CI 0.77-0.94, see Table 4-10). The scores in this assessment ranged from 50-70%, with a mean of 53.1% (sd. 7.21).

Eight students failed the mental health CbD which conferred an 8-fold increased risk of lower decile placement (OR 8.18, 95% CI 1.63-41.04, see Table 4-10), with all of these students scoring 50% on their assessment. The scores in the assessment ranged from 50-70%, with a mean of 52.8% (sd. 6.95).

Failure of the module (15 students, 2.9%), which encompassed failure at either of the CbDs and the logbook, conferred an almost 8-fold risk of lower decile placement come the end of the year (OR 7.81, 95% CI 2.44-24.94, see Table 4-10).

4.3.2.11.6 Module 307

Failure of the first SSC (fifteen students, 2.9%) tripled the risk of lower decile placement (OR 3.10, 95% CI 1.10-8.71, see Table 4-10). Failure of the second SSC (18 students, 3.5%) was not associated with lower decile placement, nor did the combined overall grade for both SSCs.

4.3.2.11.7 Module 308

Seventeen students failed the clinical pharmacology and therapeutics assessment in module 308 which was associated with an almost quadruple risk of placing in the lower deciles (OR 3.96, 95% CI 1.48-10.62, see Table 4-10).

Table 4-9: Descriptive analysis Year 3 assessments

Variable	Mean %	Range %	Standard deviation	Number of failures (%)
Year 3				
OSCE score	76.9	56.68-88.06	5.36	
OSCE grade				43 (8.4%)
KT score yr 3 overall	73.7	44.13-96.09	7.86	
KT grade yr 3 overall				6 (1.2%)
Time for dementia				3 (0.8%)
Module 301				
Attendance				7 (1.4%)
OMG				14 (2.7%)
Module 302				
Essay 1 score	74.2	35-95	11.99	
Essay 2 score	75	35-100	11.75	
Essay 3 score	73.6	35-100	12.26	
Overall essay score	73.9	5.7-93.3	8.64	
Exam	69.6	42.6-92.2	8.82	
SBM overall	73.5	55.7-87.3	6.81	
SBM overall grade				11 (2.1%)
Module 303				
Logbook				0
CbD grade				13 (2.5%)
CbD score	53.1	50-70	7.26	
OMG				13 (2.5%)
Module 304				
Logbook				1 (0.2%)
CbD grade				21 (4.1%)
CbD score	54.4	50-70	8.28	
OMG				21 (4.1%)
Module 306				
Logbook				3 (0.6%)
Elderly medicine CbD grade				11 (2.1%)
Elderly medicine CbD score	53.1	50-70	7.21	
Mental health CbD grade				8 (1.6%)
Mental health CbD score	52.8	50-70	6.95	
OMG				15 (2.9%)
Module 307				
SSC 1 grade				15 (2.9%)
SSC 2 grade				18 (3.5%)
SSC overall grade				9 (1.7%)
Module 308				
Clinical pharmacology				17 (3.3%)

Table 4-10: Analysis of the association between year 3 assessments and lower decile placement at the end of third year.

Variable	Odds Ratio of placing in lower 3 deciles	95% CI
Year 3		
Time for dementia	1.36	0.12-15.14
Module 301		
Attendance	3.56	0.79-16.10
OMG	6.96	2.15-22.55
Module 302		
Essay 1 score	0.98	0.97-0.99
Essay 2 score	0.98	0.96-1.00
Essay 3 score	0.97	0.95-0.98
Overall essay score	0.96	0.94-0.98
Exam	0.78	0.74-0.81
Overall percentage	0.71	0.62-0.81
SBM overall	0.74	0.70-0.79
SBM overall grade	7.36	1.93-28.16
Module 303		
CbD grade	6.21	1.88-20.51
CbD score	0.88	0.82-0.95
OMG	6.20	1.88-20.45
Module 304		
CbD grade	3.03	1.26-7.29
CbD score	0.83	0.75-0.92
OMG	3.06	1.27-7.36
Module 306		
Logbook	1.33	0.12-14.79
Elderly medicine CbD grade	7.36	1.93-28.16
Elderly medicine CbD score	0.85	0.77-0.94
Mental health CbD grade	8.18	1.63-41.04
OMG	7.81	2.44-24.94
Module 307		
SSC 1 grade	3.10	1.10-8.71
SSC 2 grade	1.01	0.35-2.89
SSC overall grade	0.32	0.04-2.62
Module 308		
Clinical pharmacology	3.96	1.48-10.62

Bold indicates significant association

4.3.3 Controlling for demographic variables

Each assessment was further analysed to explore if they were more or less strongly associated with the end of year three decile placement in different groups of students. When controlling for the demographic variables: gender, ethnicity, age (categories), presence of disabilities and qualification on entry, the majority of assessments remained independently predictive of placing in the lower three deciles at the end of year three. The family study score and patient study grade in year one, failure in the patient study assessment in module 202 and the knowledge test in module 203 were dropped from further analysis as the association seen in univariate analysis was entirely explained by the demographic characteristics of students.

This study aims to explore the predictive ability of the assessments rather than evaluate the known socio-demographic factors that affect performance, and so I have adjusted for those demographic characteristics in our models below to remove their effect. Assessments not found to be associated with the end of year three decile placement in the univariate analysis based on a P value of >0.05 were dropped from further analysis. Table 4-11 displays the step by step building of the predictive model. The odds ratio for each assessment variable, that was considered significant following the univariate analysis, are shown adjusted for each socio-demographic variable added in turn until the final column contains the assessment variables fully adjusted for all of the sociodemographic factors.

Table 4-11: Adjusted OR of placing in the lower three deciles at the end of third year for each assessment when adjusting for demographic factors.

Variable	Unadjusted Odds Ratio of placing in lower 3 deciles	Adjusted OR (95% CI) By gender	Adjusted OR (95% CI) By Gender + Ethnicity	Adjusted OR (95% CI) By Gender + Ethnicity + Age	Adjusted OR (95% CI) By Gender + Ethnicity + Age + Disability	Adjusted OR (95% CI) By Gender + Ethnicity + Age + Disability+ qualification on entry
Year 1						
OSCE score	0.88(0.82-0.93)	0.87(0.82-0.93)	0.89(0.83-0.95)	0.88(0.82-0.94)	0.88(0.81-0.94)	0.87(0.81-0.94)
Portfolio score 101	0.91(0.86-0.95)	0.91(0.87-0.96)	0.94(0.89-0.99)	0.91(0.86-0.96)	0.91(0.86-0.96)	0.91(0.86-0.96)
Family study score 101	0.97(0.94-0.95)	0.97(0.95-1.00)	0.98(0.95-1.00)	0.97(0.94-1.00)	0.97(0.94-0.99)	0.97(0.94-1.00)
Module essay failure 102	4.92(1.76-13.74)	4.42(1.56-12.49)	4.09(1.40-11.96)	3.47(1.15-10.43)	3.13(1.02-9.56)	3.07(1.00-9.40)
KT 102	0.92(0.90-0.94)	0.92(0.90-0.94)	0.92(0.90-0.94)	0.92(0.90-0.94)	0.93(0.91-0.95)	0.93 (0.91-0.95)
KT 103	0.89(0.87-0.91)	0.89(0.86-0.91)	0.89(0.87-0.92)	0.89(0.86-0.91)	0.89(0.87-0.92)	0.89(0.86-0.92)
KT 104	0.87 (0.85-0.90)	0.87(0.85-0.89)	0.88(0.85-0.90)	0.88(0.85-0.90)	0.88(0.85-0.90)	0.88(0.85-0.90)
Year 2						
OSCE score	0.90(0.87-0.93)	0.90(0.87-0.93)	0.91(0.88-0.94)	0.90(0.87-0.94)	0.91 (0.87-0.94)	0.90(0.87-0.94)
OSCE failure	3.65(1.42-9.40)	3.29(1.26-8.57)	3.35(1.26-8.94)	3.57 (1.31-9.76)	3.37(1.22-9.21)	3.46 (1.26-9.51)
Portfolio Score 201	0.94(0.91-0.97)	0.94(0.92-0.97)	0.94(0.92-0.97)	0.94(0.91-0.97)	0.94(0.91-0.97)	0.94(0.91-0.97)

<i>Portfolio failure 201</i>	3.74(1.37-10.20)	3.74(1.36-10.32)	3.55(1.25-10.05)	3.92(1.35-11.41)	3.95(1.37-11.36)	3.98(1.39-11.42)
<i>Pt study score 201</i>	0.96(0.94-0.98)	0.96(0.94-0.98)	0.96(0.94-0.98)	0.96(0.94-0.98)	0.96(0.95-0.98)	0.96(0.95-0.98)
<i>Case studies score 202</i>	0.92(0.90-0.94)	0.91(0.89-0.94)	0.92(0.90-0.94)	0.91(0.89-0.94)	0.91(0.89-0.94)	0.92(0.89-0.94)
<i>KT 202</i>	0.89(0.87-0.91)	0.89(0.87-0.91)	0.89(0.87-0.91)	0.89(0.87-0.92)	0.90(0.87-0.92)	0.89(0.87-0.92)
<i>KT failure 202</i>	5.65(2.35-13.58)	4.92(2.03-11.94)	5.25(2.11-13.06)	5.19(2.05-13.18)	4.87(1.88-12.57)	4.84(1.88-12.47)
<i>KT 203</i>	0.85 (0.83-0.88)	0.85(0.83-0.88)	0.86(0.83-0.88)	0.86(0.83-0.88)	0.86(0.83-0.88)	0.86(0.83-0.88)
<i>KT 204</i>	0.87(0.85-0.89)	0.87(0.85-0.89)	0.87(0.85-0.89)	0.87(0.85-0.89)	0.87(0.85-0.89)	0.87(0.85-0.89)
<i>KT failure 204</i>	13.01(6.49-26.08)	13.91(6.87-28.16)	14.30(6.95-29.39)	14.37(6.90-29.93)	12.95(6.21-27.00)	13.20(6.33-27.53)
Year 3						
<i>Overall Essay score</i>	0.96(0.94-0.98)	0.96(0.94-0.98)	0.96(0.94-0.98)	0.96(0.93-0.98)	0.96(0.94-0.98)	0.96(0.94-0.98)
<i>CbD failure 303</i>	6.21(1.88-20.51)	5.85 (1.77-19.41)	4.11(1.21-13.30)	4.92(1.45-16.67)	4.42(1.27-15.36)	4.54(1.32-15.65)
<i>CbD score 303</i>	0.88(0.82-0.95)	0.88(0.82-0.95)	0.89(0.82-0.95)	0.88(0.82-0.95)	0.88(0.82-0.95)	0.88(0.82-0.95)
<i>CBD failure 304</i>	3.03(1.26-7.29)	2.84(1.17-6.87)	2.96(1.20-7.33)	3.19(1.26-8.07)	3.37(1.31-8.67)	3.30(1.28-8.46)
<i>CBD score 304</i>	0.83(0.75-0.92)	0.83(0.75-0.91)	0.83(0.75-0.91)	0.83(0.75-0.91)	0.83(0.75-0.92)	0.83(0.75-0.92)
<i>Elderly medicine CbD failure</i>	7.36(1.93-28.16)	7.09(1.85-27.25)	5.12(1.31-20.12)	4.11(1.04-16.28)	4.42(1.11-17.61)	4.42(1.11-17.62)
<i>Elderly medicine CbD score</i>	0.85(0.77-0.94)	0.85(0.77-0.94)	0.84(0.76-0.93)	0.85(0.77-0.94)	0.84(0.76-0.93)	0.84(0.76-0.93)

<i>Mental health CbD failure</i>	8.18(1.63- 41.04)	7.68(1.52- 38.72)	6.74(1.29- 35.12)	7.26(1.36- 38.83)	5.56(1.06- 29.32)	5.50(1.04- 29.20)
<i>SSC 1 failure</i>	3.10(1.10- 8.71)	2.92(1.03- 8.25)	2.99(1.04- 8.63)	3.14(1.08- 9.15)	3.14(1.07- 9.22)	3.07(1.04- 9.03)
<i>Clinical pharmacolog y and therapeutics</i>	3.96(1.48- 10.62)	3.75 (1.39- 10.10)	3.43(1.25- 9.41)	3.47(1.24- 9.67)	3.77(1.32- 10.73)	3.70(1.31- 10.49)
Cumulative variables						
<i>Any attendance failure</i>	3.19(1.60- 6.35)	3.08(1.54- 6.18)	3.04(1.49- 6.19)	2.92(1.40- 6.08)	2.62(1.247 -5.51)	2.65(1.26- 5.55)
<i>OSCE failure year1/2</i>	3.93(1.63- 9.51)	3.54(1.45- 8.63)	3.34(1.34- 8.33)	3.24(1.25- 8.41)	3.10(1.19- 8.07)	3.18(1.21- 8.31)
<i>Any KT failure year1/2</i>	9.14(5.67- 14.75)	8.89(5.49- 14.38)	8.62(5.23- 14.11)	8.28(5.02- 13.65)	7.54(4.56- 12.50)	7.68(4.63- 12.74)
<i>Any CbD failure</i>	5.07(2.59- 9.94)	4.91(2.50- 9.64)	4.50(2.26- 8.95)	4.63(2.29- 9.38)	4.44(2.17- 9.08)	4.52(2.22- 9.20)
Reference group: White, female, youngest age, school leavers with no disclosed disability						

4.4 Predictive models

Three multiple-variable predictive models were created to analyse which assessments within years one, two and three explained the greatest degree of variance associated with decile outcome at the end of year three. The demographic variables; gender, ethnicity, entry route into medicine and presence of a disability, were included in the model due to their strong theoretical associations with academic performance, as discussed in Chapter 1, and in order to examine the effect of our assessments without the contribution of demographic factors. Age was no longer an independent predictor of decile placement when adjusted for entry route into medicine due to collinearity and was therefore not included in any of the three models. Assessment scores that were independent predictors of decile placement at univariate analysis were fed into the models in a forward stepwise fashion to analyse whether they remained independently predictive of decile placement above and beyond the demographic predictors and whether this strengthened the degree of variance explained by the model. As sequential assessment variables were added, the effect on variance was assessed.

4.4.1 Year 1 assessments

Table 4-12 shows the predictor model using year one assessments. The two assessments in year one that independently predicted decile placement at the end of year three, above and beyond the degree of variance explained by attainment difference due to demographic variables, were the knowledge tests in modules 103 and 104. Including 103 and 104 KT improved the variance explained from 14% to 41%.

Each percentile point scored in the KT in module 104 corresponded to a 9% reduced chance of placing in the lower deciles in year three (OR 0.91, 95% CI 0.87-0.95, see Table 4-12). The KT in module 103 also remained independently predictive of decile outcome in year three, with each percentile point achieved conferring a 5% reduction in risk of lower decile placement (OR 0.95, 95% CI 0.91-0.98, see Table 4-12).

The performance in the knowledge tests did not explain all the difference in performance seen with the demographic variables. Male students remained twice as likely to place in the lower deciles (OR 2.18, 95% CI 1.33-3.55, see Table 4-12). Similarly, non-White students were over two and a half times more likely to place in the lower deciles (OR 2.65, 95% CI 1.61-4.37, see Table

4-12) than their White peers. Students who did not enter medical school directly following their A-levels were twice as likely to place in the lower deciles than school-leavers (OR 2.08, 95%CI 1.33-3.44, see Table 4-12). Students who had disclosed the presence of a mental health condition were three times as likely to place in the lower deciles in year three (OR 3.22, 95% CI 1.49-6.95, see Table 4-12), with students who disclosed non-visible disabilities being two and a half times at risk (OR 2.65, 95% CI 1.11-6.35, see Table 4-12). These two assessments, alongside the demographic predictors, accounted for around 41% of the variation in decile outcome in year three but as demonstrated above sociodemographic characteristics of students still affected decile placement over and above ability at the KT

The addition of the score students obtained in the OSCE in year one slightly improved the variance in the decile outcome explained by the model (44%). Interestingly the difference in the gender awarding gap noted in the univariate analysis was no longer present once the OSCE score was included (OR 0.89, 95% CI 0.34-2.30). This indicates that the variance in decile outcome previously attributed to gender is explained by the gender disparities in OSCE performance. A similar finding was noted for students who did not enter medical school directly following their A-levels (OR 2.21, 95% CI 0.79-6.14). Non-White students (OR 3.14, 95% CI 1.14-8.67) and those with mental health disabilities (OR 9.13, 95% CI 1.69-49.36) remained independent predictors of decile outcome outside of individual assessment performance. Performance in the OSCE (OR 0.89, 95% CI 0.78-1.03) and KT in module 103 (OR 0.99, 95% CI 0.89-1.08) assessments were no longer independently predictive of decile outcome, suggesting performance at these two assessments are highly correlated with each other. However, as the OSCE data were only available for the one-year group, this variable was removed from the final model.

Table 4-12: Year one assessment predictor model describing the degree of variance explained by year 1 assessment performance and placing in the lower three deciles at the end of third year.

Variable	*Adjusted OR	95% Confidence intervals	Nagelkerke R ²
Male	2.18	1.33-3.55	
Non White ethnicity	2.65	1.61-4.37	
Non-traditional Entry	2.08	1.33-3.44	
Disability			
Learning difficulties	1.57	0.72-3.44	
Sensory	6.09	0.58-64.35	
Mental health	3.22	1.49-6.95	
Non visible disabilities	2.65	1.11-6.35	
KT103**	0.95	0.91-0.98	
KT104**	0.91	0.87-0.95	
			0.41
* Adjusted for all other variables in the model			
** For each percentage increase in score			

4.4.2 Year 2 assessments

Model two (Table 4-13) describes the assessments in year two that explained the greatest degree of variance in risk associated with placing in the lower three deciles at the end of year three. The four assessments that best predicted placing in the lower three deciles were the OSCE score (OR 0.95, 95% CI 0.91-0.99), the portfolio score (OR 0.95, 95% CI 0.91-0.98,) and the two knowledge tests in modules 203 (OR 0.93, 95% CI 0.89-0.96,) and 204 (OR 0.91, 95% CI 0.88-0.93, see Table 4-13). The strongest of these was the final knowledge test in year two (module 204), in which each percentile point scored reduced the risk of placing in the lower deciles in year three by 9%. Each percentile point attained in the knowledge test in module 203 reduced the risk by 7%. Scores in the portfolio, and the OSCE added further predictive value, with each percentile point attained reducing the risk by 5%.

The gender performance differential was no longer apparent in this model (OR 1.54 95% CI 0.94-2.51, see Table 4-13). Stepwise analysis identified that the gender disparity seen in univariate analysis was driven by performance in the KT in module 203, which impacted the overall model.

Similarly, the presence of a mental health condition was no longer independently predictive of decile outcome (OR 1.67, 95%CI 0.79-3.53, see Table 4-13). The association seen between having a mental health condition and decile outcome was entirely explained by student's performance in the module 204 KT. The risk of lower decile placement associated with being non-White remained an independent predictor conferring a two-and-a-half times greater risk than their white peers (OR 2.58, 95% CI 0.94-2.51, see Table 4-13). This suggests that there are other pathways in which being non-White results in lower decile placement beyond performance at the module 204 KT. Similarly, the risk associated with entering medicine from any pathway other than following the completion of A-Levels was still an independent predictor, conferring twice the risk of placing in lower deciles (OR 2.31, 95% CI 1.40-3.80, see Table 4-13). Year two assessments explained more of the variance in year three decile outcome than year one assessments, accounting for 54 % of the variation (Nagelkerke R² - 0.539).

Table 4-13: Multiple variable model assessing degree of variance explained by year 2 assessment performance and year 3 decile outcome

Variable	*Adjusted OR	95% Confidence intervals	Nagelkerke R ²
Gender	1.54	0.94-2.51	
Ethnicity (White/non-White)	2.58	1.58-4.21	
Non-traditional Entry	2.31	1.40-3.80	
Disability			
Learning difficulties	1.76	0.82-3.78	
Sensory	2.56	0.23-28.33	
Mental health	1.67	0.79-3.53	
Non visible disabilities	2.40	1.00-5.76	
OSCE score**	0.95	0.91-0.99	
Portfolio score**	0.95	0.91-0.98	
KT203**	0.93	0.89-96	
KT204**	0.91	0.88-0.93	
			0.54
*Adjusted for all other variables in the model			
** For each percentage increase in score			

4.4.3 Year 3 assessments

The third model (Table 4-14) analysed which assessments within year three most predicted decile outcome. The CbD scores in the medical, surgical and elderly care placements were all predictive of decile outcomes. Each percentile point achieved reduced the risk of placing in the lower three deciles at the end of year by between 11-16%. For each percentage point attained in the surgical CbD, there was a 16% reduction in placing in the lower deciles (OR 0.84, 95% CI 0.76-0.93), this was 15% for each percentile point in the elderly medicine CbD (OR 0.85, 95% CI 0.76-0.94) and 11% for the general medical CbD (OR 0.89, 95% CI 0.82-0.96, see Table 4-14). Failure in any of the CbDs added additional predictive value, with these students being three times as likely to place in the lower deciles (3.38, 95% CI 1.38-8.31, see Table 4-14). The cumulative essay score was also predictive with each percentile point attained reducing the risk of lower decile placement by 5% (OR 0.95, 95% CI 0.92-0.98, see Table 4-14).

In this model, gender was not independently associated with decile placement once assessment performance was taken into account. Stepwise analysis found that the gender performance gap was not driven by a specific assessment but was present across all the assessments. The ethnicity awarding gap widened when accounting for these assessments with an almost quadruple risk of placing in the lower decile for students who identified as non-White (OR 3.91, 95% CI 2.12-7.21, see Table 4-14). Again, this indicates that for non-White students, other factors are affecting decile placement performance more frequently than for their White peers. Non-school leavers remained at over double the risk of lower decile placement (OR 2.38, 95% CI 1.32-4.30, see Table 4-14) as did students who had a mental health condition (OR 2.59, 95% CI 1.14-5.90, see Table 4-14). This model explained almost 50% of the variance in decile outcome for year three assessments (Nagelkerke $R^2 = 0.48$).

Table 4-14: Multiple variable model assessing degree of variance explained by year 3 assessment performance and year 3 decile outcome

Variable	*Adjusted OR	95% Confidence intervals	Nagelkerke R ²
Gender	1.05	0.58-1.90	
Ethnicity (White/non-White)	3.91	2.12-7.21	
Non-traditional Entry	2.38	1.32-4.30	
Disability			
Learning difficulties	2.42	0.99-5.86	
Sensory	7.32	0.42-127.78	
Mental health	2.59	1.14-5.90	
Non visible disabilities	2.94	0.99-8.69	
CbD Medicine score**	0.89	0.82-0.96	
CbD Surgery score**	0.84	0.76-0.93	
Elderly medicine CbD score**	0.85	0.76-0.94	
Any CbD failure	3.38	1.38-8.31	
Overall Essay score**	0.95	0.92-0.98	
			0.48
*Adjusted for all other variables in the model			
** For each percentage increase in score			

4.5 Sub-analyses

Failure in attendance and individual assessment was rare, limiting the statistical inferences that could be made. A sub-analysis was performed to explore whether cumulative failure or any failure in similar assessment modalities was predictive of decile outcome. A further analysis was performed to explore if students' decile position changed between years.

4.5.1 Cumulative attendance failure

Due to the small sample size of students who failed to attend the requisite amount of sessions across the modules the univariate analysis failed to reach statistical significance except for the primary care sessions in Module 201 and modules 203 and 204. However, cumulative failure was significantly predictive of decile placement in third year. Thirty-five students failed to reach the required attendance levels in at least one module, of these, eight failed to do so on multiple occasions ranging from two to four modules. Overall, this trebled their risk of placing in the lower deciles at the end of third year compared to those who attended all attendance monitored sessions (OR 3.19, 95% CI 1.60-6.35).

4.5.2 Assessment type sub-analysis

Failure in either OSCEs or the KTs in the first two years was strongly predictive of decile placement in year three. 21 out of 637 students failed either the year one or year two OSCE, with no student failing both, which almost quadrupled their risk of placing in the lower deciles at the end of the third year OR 3.93, 95% CI 1.63-9.51, see Table 4-15). A larger proportion of students (97) failed the knowledge tests held in the first two years of the course; of these, the vast majority failed a single one, with fifteen students failing two and only five failing three. Failure of any of the KTs resulted in a nine-fold increased risk of placing in the lower deciles at the end of the third year (OR 9.14, 95% CI 5.67-14.75). Whilst failing multiple KTs compared to a single KT did not appear to add incremental predictive validity of lower decile placement, all the students who failed three KTs placed in the lower three deciles at the end of the third year (see Table 4-15).

Univariate analysis of demographic variations between the risk of OSCE and KT failure did show that female students outperform male students in both types of assessment, but the discrepancy was more apparent in the OSCE compared to the KT (Table 4-16). Students who identified as non-White were almost twice as likely as their White peers to fail their KTs (OR 1.86, 95% CI 1.20-2.88), but there was no evidence higher risk of failure in OSCEs based on ethnicity. Further breakdown by ethnicity was not feasible due to the small sample sizes.

Within the third year, the most regular assessments were the logbooks and CbDs. Failure to get the requisite sign-offs in the logbook was rare, with this only four students being unable to complete them at any point in the year. However, failure at the CbDs appears to be a significant predictor of decile outcome at the end of the year, with students who failed any CbDs (40/519)

being five times as likely to place in the lower three deciles (OR 5.07, 95% CI 2.59-9.94, see Table 4-17). Recurrent failure in CbDs may increase this risk, but the numbers were too small to reach statistical significance (Table 4-17).

Table 4-15: Analysis of association of cumulative OSCE and KT failure with decile placement in year 3

Variable	Odds Ratio of placing in lower 3 deciles	95% CI	Frequency
OSCE failure yr1/2	3.93	1.63-9.51	21 (3.3%)
KT failure yr1/2			
Any failure	9.14	5.67-14.75	97 (15.2%)
Single	8.42	5.01-14.16	77 (12.1%)
Two	8.59	2.87-25.67	15 (2.4%)

Table 4-16: Analysis of the effect of gender or ethnicity on the risk of failing an OSCE or KT in years 1 and/or 2

Variable	Odds Ratio of OSCE failure in year 1/2	95% CI	Odds ratio of failing any/multiple KTs in year1/2	95% CI2
Male	2.52	1.03-6.18	1.58	1.03-2.45
Non-White ethnicity	1.85	0.78-4.43	1.86	1.20-2.88

Table 4-17: Analysis of the association between cumulative logbook and CbD failure on Year 3 decile placement

Variable	Odds Ratio of placing in lower 3 deciles	95% CI	Frequency
Any logbook failure in year 3	2.65	0.37-18.91	4 (0.8%)
Any CbD failure year 3	5.07	2.59-9.94	40 (7.7%)
CbD failure			
1	4.68	2.26-9.70	33 (6.4%)
2	9.13	0.94-88.59	4 (0.8%)
4	6.09	0.55-67.71	3 (0.6%)
CbD failure			
Single	4.68	2.26-9.70	33 (6.4%)
Multiple	7.61	1.46-39.72	7 (1.35%)

4.5.3 Decile change between years

A further analysis was conducted to analyse whether students were able to change decile placements between years of study. Decile placement is a composite score as described in the methods chapter, with the clinical years providing a greater weighting to their ranking score.

Figure 4-1 shows that whilst movement between deciles is possible, the majority of students remain in their original decile or change within two decile placements, accounting for almost 80% of the student cohort. The mean difference in decile placement between years one and two was nearly one and a half decile places, but some students were able to move as many as seven decile places. The likelihood of changing decile placement was reduced in subsequent years, resulting in, on average, students moving less than one decile between years three and four (see Table 4-18). This reflects the cumulative nature of ranking calculations, as explained in section 3.1.5.1 in the methods chapter.

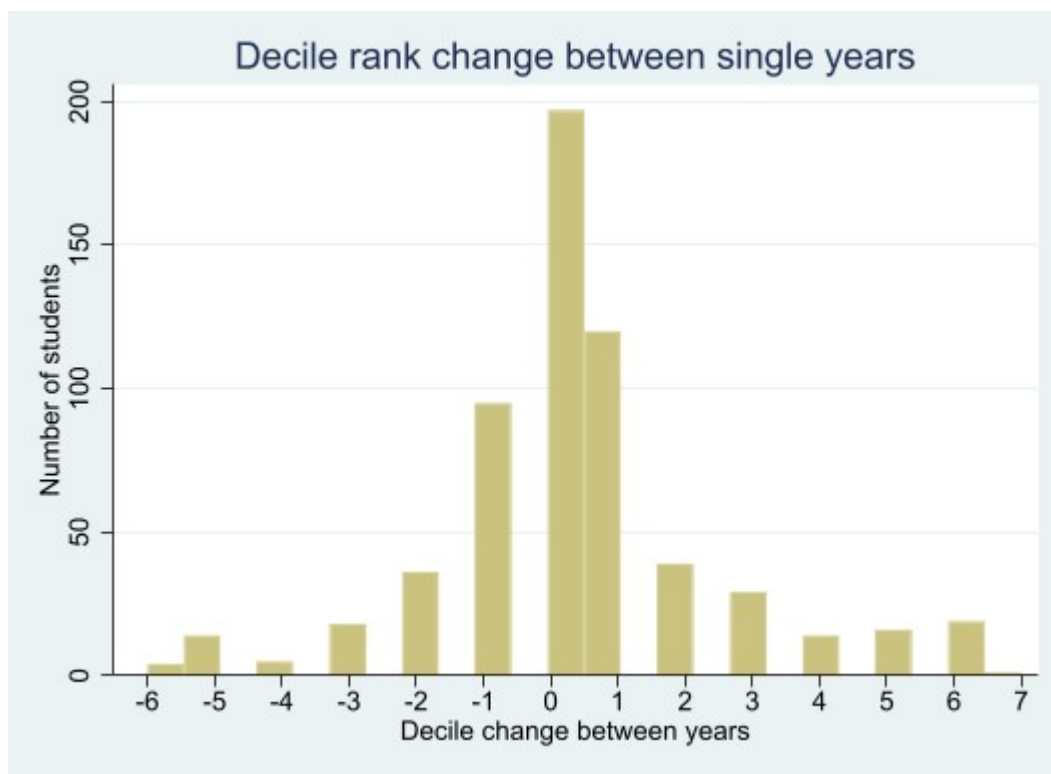


Figure 4-1. Decile change of students between year groups

The pattern of decile change of students who placed in the lower three deciles was similar to the pattern of decile change of the whole cohort of students. The average decile change was 1.5 and 1.8 between years one and two and years two and three, respectively. 31% of students who placed in the lower three deciles at the end of the third year stayed in the same deciles between years two and three, with the remaining 71% moving within two decile scores.

Students who placed in the lower three deciles in year one had an almost eight-fold increase in risk of doing so in their third year (OR 7.78, 95% CI 4.99-12.12). The risk increased thirteen-fold between years two and three (OR 12.94, 95% CI 7.59-22.04, see Table 4-19).

Table 4-18: Descriptive analysis of decile change for all students between year groups

Variable	Mean	Standard deviation
Decile Change		
Year 1-2	1.475	1.334
Year 2-3	1.294	1.447
Year 3-4	0.951	1.034

Table 4-19: Analysis of the associated risk of placing in the lower deciles at the end of third year when compared to lower decile placement in years 1 and 2.

Variable	Odds Ratio of placing in lower 3 deciles	95% CI
Lower 3 deciles in yr1	7.78	4.99-12.12
Lower 3 deciles in yr2	12.94	7.59-22.04

4.6 Discussion

Main Findings

- Early assessment performance is predictive of ongoing academic performance, with knowledge tests and objective structured clinical examination (OSCE) assessments having the strongest association.
- Multimodal assessment increases the explained variance of ongoing academic performance, which is important for educators who seek to identify and support students who face academic difficulty early in the student journey.
- Educators can be reassured that they do not need to delay offering support by waiting for students to complete a large number of assessments, as our models only required a few assessments before the maximum level of variance was explained.
- However, predictive modelling should be used cautiously, especially with the risk of profiling and stigmatisation; our strongest model could only explain 50% of the variance in academic performance.
- Student academic performance remains relatively stable over time, with the majority of students only moving between two decile placements between years.
- However, a proportion of students' performance is unpredictable, with evidence of some students shifting between relatively poor to strong performances and vice versa.
- Differential attainment based on gender, ethnicity, disability and entry route to medicine is reaffirmed in this study. However, this is the first study that has identified that the disclosure of a mental health condition prior to starting the course is associated with lower academic performance.
- This study also highlights that students who attend medicine through Access courses are at particularly high risk of lower academic performance relative to their peers. The causes for this and how the best ways to support students from non-traditional backgrounds remains an important avenue for future research.

Early identification of academically struggling students remains a challenging but essential component of remediation to help stop the 'cycle of underperformance' characteristic of many struggling students.²¹ This study adds to the limited literature which has shown that early academic performance at medical school predicts ongoing performance,¹⁵¹⁻¹⁵³ and identifies a broader range of assessments in the preclinical years than previously described. The predictive models highlighted that multiple assessments that test a variety of learning skills add value when attempting to predict future academic performance. This strengthens the calls in medical education literature to use multimodal assessment data to not only identify the students but also guide the support strategies that are offered.^{5,233,242,243} Most of the studies in the literature focused on knowledge tests and OSCE assessments^{151,152} when investigating for evidence of predictive validity, and for good reason, as these assessments proved to have the strongest association. However, this study has shown that other assessments, such as portfolio assessments which tests students' abilities to reflect on their experiences, add predictive value. This study has also shown that the case based discussion assessments, which are not included in decile calculations, are useful assessments when predicting ongoing performance in knowledge tests and OSCEs; this is likely as they assess integrated performance in practice encompassing a multitude of skills, including; clinical knowledge and skills, decision making, teamwork, ethics and communication.^{376,377} However, the modality of the exam in an oral fashion may disadvantage some learners.

An area of concern in remediation literature has centred around the need to balance the accumulation of measures of performance without delaying the identification of those at risk of academic underperformance resulting in the delayed provision of support.⁵ Whilst the predictive models did indicate multimodal assessments explained the greatest variance (54% in model 2), none of them required greater than five performance measurements before reaching the maximal value. Adding additional assessment measurements only re-iterated the degree of variance already explained by the other assessments. This indicates that the use of well-placed assessments early in the year may help both students and educators identify the need for discussions about their academic performance and potential support strategies and adaptations to learning practices.

Despite the positive findings mentioned above, even using multiple assessments that test a wide variety of learning skills, the predictive models could only explain 40-50% of the variance of latter academic performance. Predicting an individual learners journey through the medical course is impossible as data-driven approaches are unable to account for the complex nuances of human processes or the social contextual factors.³²⁴ For example, it is impossible to predict whether a

student will face unexpected external challenges to their learning during the course, such as significant life events or mental health problems. Furthermore, predicting how such an event will impact their behaviour is fraught with difficulties, some students may utilise the additional difficulties as a motivation to succeed whereas others may perceive it as the cause of their poor academic performance.¹⁷⁵ Known correlates of academic performance such as, personality traits, motivational factors, goal-setting, effort regulation, self-efficacy, use of self-regulated learning (SRL) strategies³² and student agency or positionality are not quantifiable in a measure that can be included into a predictive model either. It is likely there are also unknown factors that have yet to be identified in the literature that impact academic performance. These unknown, unidentified or unmeasurable factors are important to consider when deciding how to implement the findings from studies aiming to predict future outcomes. This is discussed in greater detail in Chapter 6.

There is limited knowledge about the potential for students to move between decile ranking whilst at medical school. Krupat et al's. study took a similar approach to ours and identified that students who placed in the lower quartile of 1st year assessments were at higher risk of academic underperformance in clerkship assessments. However, the authors rightly caution that this relationship is dynamic stating that almost 10 percent of students who struggle in year one perform extremely well in clerkship years and a similar proportion do the opposite, performing well in year one but struggle in clerkship assessments.¹⁵³ Our results re-emphasise this, whilst the majority of students remain within two decile placements of their prior year ranking, there remains a significant potential for change in performance relative to their peers between years. This reduces over time as the weighting of the deciles scores is more heavily weighted to the clinical years. Identifying which students remain in the lower deciles and which drop into the lower deciles having performed well in the preclinical assessments is difficult to extrapolate from the data. We propose ways of integrating the findings from this study into longitudinal support structures in the final discussion chapter.

Another danger with these models is the potential to stigmatise and marginalise students through profiling and labelling them as 'struggling students'. This is particularly important when considering the impact of differential attainment on marginalised, under-represented student cohorts. This study re-iterated prior findings which shows that medicine remains an unequal playing field. Female students outperform their male counterparts and this is more apparent in OSCE assessments.¹⁴⁵⁻¹⁴⁸ The cause of this awarding gap is unclear but may be driven to some degree by finding that the ethnicity awarding gap is significantly more apparent in male students. In our models we could conclude that whilst gender affects students' performance at individual

assessments these demographic characteristics did not have a role in decile performance over and above that.

A meta-analysis looking at differential attainment due to ethnic background found that odds of failing at medical school were 2.5 times higher for a non-White compared to a White student.¹⁸⁹ This study shows that this same risk is present for those students who are able to persist on the course. The ethnicity awarding gap in undergraduate medical school performance has been shown in numerous studies,^{42,144,189,190} and remains significant even when prior educational attainment, study habits and clinical experience were controlled for.¹⁴⁴ Prior studies have identified international medical students as higher risk of academic underperformance^{145,202–205} but this was not evident in our analysis although due to the low sample size within our cohort no conclusions can be drawn from this analysis.

This study also highlighted the impact disabilities have on academic performance. The only disability category that showed evidence of a link to academic performance was the disclosure of a mental health condition on entry to the course. Mental distress has been linked with lower academic self-efficacy, negatively impacting study progress and contributes to higher attrition rates in higher education.^{127,182} Depression and anxiety can reduce cognitive function and affect memory and concentration making it harder for students to acquire new knowledge and manage the stresses of the course especially during examination periods.^{182,183} This study is the first to our knowledge that directly identifies the presence of a known mental health condition prior to starting medical school as an independent risk factor for lower relative academic performance. This is an important finding given the medical course, known to be a particularly stressful and challenging course³⁷⁸, has been shown to increase the prevalence of mental distress, depression and burnout.^{8,9} Therefore, there may be a far greater proportion of students who are affected than identified in this study that either have chosen not to disclose their condition on entry to the course or acquire a diagnosis whilst at medical school.. Interestingly students with learning difficulties were not found to be at higher risk of lower academic performance and this supports the small amount of literature that has shown that students with specific learning disabilities such as dyslexia don't appear to be disadvantaged in multiple choice assessments or OSCE's.^{379–381} This raises questions regarding the differences in the available support for students with a range of disabilities. Is there an issue with inadequate support for students with mental health problems compared to learning difficulties or are the learning needs of students with learning difficulties more homogenous and easier to address? For example, providing students with learning disabilities additional time as a reasonable adjustment may not address anxiety associated with assessments.

Despite the small sample size, this study shows that students who attend medical school from Access courses are at significant increased risk of struggling academically once at medical school. Evidence suggests that there are higher attrition rates for gateway students^{113,114} and a larger study looking at three gateway courses in the UK also found that gateway students obtained lower scores in both components of the application scores for foundation jobs; the educational performance measure (EPM) scores, derived from student ranking, additional degrees and publications, and scores in the situational judgment test (SJT) which aims to assess non-academic skills.¹¹¹ Interestingly this discrepancy is reduced for EPM scores and almost eliminated for SJT scores once educational attainment on entry is controlled for, unfortunately we were unable to do this in our analysis due to the inability to obtain access to that data. They noted that despite gateway students having lower attainment scores on entry they achieved scores across all deciles and conclude that the reduced difference in attainment between entry and outcome criteria as evidence that gateway students demonstrate greater academic potential than their secondary educational attainment suggests. This finding is important when considering whether the EPM remains a fair reflection of performance given its importance in the foundation school application system. This is discussed in greater detail in the discussion chapter.

How institutions can utilise the promising findings that early assessment data can be beneficial in the early identification of students at risk, whilst acknowledging and safeguarding students from the risks are discussed in greater detail in the discussion chapter. The impact of differential attainment on the equity of medical school within the context of a drive to widen participation and improve inclusivity are explored. Finally, we discuss the negative impact differential attainment has on the current selection process for foundation school calling for a greater consideration of the appropriateness of the process.

4.7 Conclusion

Performance across various early assessment modalities can be a helpful tool in predicting those students who manage to persist in the medical course but who struggle academically. More work needs to be done to consider how to implement these findings to enable institutions to identify areas students find challenging and provide timely support. However, these scores only account for around 50% of the variance in performance and do not explain numerous other factors that contribute to academic performance.

The study also identifies evidence of differential attainment impacts the decile score, which is a component of the EPM and raises concerns about the equity of its continued use in the application process for foundation schools.

4.8 Limitations

This study is a retrospective, observational cohort study derived from a single institution analysing assessments specific to the course and the curriculum, and therefore the results may not apply to other institutions. However, the curriculum at Brighton and Sussex Medical School (BSMS) matches the standard division across medical schools in which the first two years focus on the basic sciences with a shift to clinical evaluation in year three. Most studies regarding assessment in medical education also describe knowledge assessment in the form of single best answer or short answer questions (SBA/SAQs) and OSCE as standard practice. In addition, our cohort demographics are representative of students at medical schools in the UK, as presented in the Higher Education Statistics Agency (HESA) database. Therefore, the findings from this study are more likely to be relevant across medical institutions in the UK.

Changes in the assessment breakdown during the years studied and the nature of utilising databases not created for research purposes leads to missing data. Where this occurred, this was documented in the analysis of the results. In addition, due to relatively small numbers of students from ethnic minority groups, there was a need to group students from similar ethnic backgrounds, limiting the ability to investigate for differences within ethnic minority categories. However, the categories were kept as broad as possible and aligned with those used in the UKMED database.

As a retrospective study, we do not make claims of cause or effect but have focused on examining evidence of an association between the assessments and later academic performance. Limitations associated with utilising large numbers of predictor variables in regression models is the risk of identifying predictor variables that show a statistical association with the outcome variable by chance. One way of mitigating for this could have been to increase the level of significance required to identify an association. The univariate analysis was exploratory analysis to understand which modalities of assessments carried the greatest association with decile placement. The subsequent explanatory models were built using my understanding of the course and the potential assessment variables and did not rely solely on univariate significance testing. The explanatory models only included a small number of predictor variables reducing the risk of finding associations by chance alone. In the results section, comments regarding the effect size

accompanied any evidence of association between predictor variables and the outcome variable. In addition, when appropriate, concerns regarding inferences that could be drawn from these effect sizes were described and caution was advised, for example where the sample size is small leading to wide confidence intervals.

The choice of the outcome variable being the end of the third year decile rather than the end of the fourth year, the final year in which a decile score is calculated as a surrogate for academic performance, may raise queries. The use of decile outcome at the end of the third year was chosen as the study aimed to identify assessments that predicted future performance early in the course. In addition, the students who have not persisted in the course will not be present in the analysis, thus enriching the cohort with successful medical students and potentially limiting the findings. Finally, the third year covers the core medical and surgical speciality rotations with a greater focus on speciality rotations in year 4.

The lack of access to preadmission data, including prior academic attainment, aptitude scores, demographic data and socioeconomic data and whether students were widening participation students has limited the degree of analysis. However, this has been investigated at a national database level previously.

5 How do students make sense of their experiences at medical school and attribute the causes of their academic difficulties? – An IPA analysis

The aim of this component of the thesis was to explore the lived experience of students who had completed the first three years of the course and placed in the lower three deciles of assessment performance. By creating a narrative of their experiences of the curriculum, learning, assessment, failure, support, socialising, belonging and the ranking process we aim to better understand how they understand and attribute the causes of their academic performance and how this impacts their behaviours. This may help offer new insights that can guide curriculum development, assessment design and implementation and the delivery of academic, psychological and fiscal support.

Eight participants completed interviews that lasted between 65 and 97 minutes (mean = 82 minutes). Participant demographics are displayed in Table 1-1. Four of the participants were male and four were female. There was an even number of students in which medicine was their first degree and those who were postgraduate students on entry. Two participants were from ethnic minority groups, and four of the participants described themselves as non-traditional students (i.e. graduate entry or entered via Access courses or through widening participation initiatives). Two of the participants were in their final year and six were in their fourth year. The interviews were undertaken between May and June 2021.

Table 5-1 Summary of participant characteristics

Gender	Ethnicity	Entry Qualifications	Year when interviewed	Failure?	Stage of failure	Years out?
Four Female, Four Male	Six White British, One Asian, One Black,	Four Undergraduates, Four Postgraduates	Six 4 th year students, Two 5 th year students	Two had no experience of failure, Two failed a single written assessment, One failed multiple written assessments, One failed both written and OSCE assessment, One failed a single CbD and One Failed multiple CbDs	Two failed in preclinical years, One failed in both preclinical and clinical years, Three failed in clinical years	Three students did not intermit or re-sit, Two intermitted following mental health difficulties, One student repeated year 2 and Two students repeated year 3
OSCE: Objective Structured Clinical Examination, CbD: Case-based discussion						

5.1 Interpretative Phenomenological Analysis

Within the narratives provided by the participants, four clear themes became apparent (Table 5-2):

1. The impact of failure on participants
2. The spectre of ranking and its negative consequences
3. Academic support lags behind psychological support
4. The importance of belonging

Each of these themes consisted of several subthemes, and although not all sub-themes were relevant to all of the participants' accounts, the four major themes were evident in all transcripts. The way in which participants discussed and made sense of their experiences was of a dual nature, reminiscent of goldilocks and the three bears. For example, too much support and structure was stifling, but too little was neglectful. Too many assessments were anxiety provoking, contributing to a competitive environment, but too few inhibited their ability to receive support in a timely fashion. Failure was a horrible experience that they wished to have avoided but was integral to their ability to develop and adapt: it changed where they positioned themselves within their narrative as they develop the ability to regulate, control and monitor their own learning (agentic learning) to overcome their difficulties. This is explored in detail as a meta-theme: 'Duality and contradiction'.

The four major themes, and their component sub-themes, are discussed below, with illustrative quotes given to support and justify the explanations and interpretations.

Table 5-2 List of Themes, subthemes and meta themes

Theme	Subtheme
1. The Impact of failure on participants	<ul style="list-style-type: none"> a. Failure is a new experience b. Failure challenges students' sense of self c. Failure is difficult to discuss d. The negative emotional impact of failure e. The negative effects of failure can be long lasting f. The practical implications of failure g. Not all failure is equal h. Failure has its benefits; The catalyst for change
2. The spectre of ranking and its negative consequences	<ul style="list-style-type: none"> a. The obsession with ranking b. Ranking as taboo c. Ranking is difficult to learn from d. Ranking feels unfair e. Managing responses to ranking f. Do we need to breed more competition?
3. Academic support lags behind psychological support	<ul style="list-style-type: none"> a. The psychological support offered was beneficial b. External support has many barriers c. What can be learnt from student support and how can it translate to academic support? d. Preclinical/clinical divide revisited through formal remediation e. Informal support f. Support is intertwined in the curriculum
4. The importance of belonging	<ul style="list-style-type: none"> a. A welcoming yet competitive environment b. Socialising with peers – a complex terrain c. Protecting their sense of self d. Developing relationships with clinical staff and integrating with teams
Meta theme: Duality and contradiction	<ul style="list-style-type: none"> a. The duality of failure b. The duality of assessment, feedback and support c. Conflicting desires of structure and independence d. The necessity to belong: a double-edged sword

5.1.1 Theme 1: The impact of failure on participants

The first theme addressed how failure was experienced and understood. For many, it was a new experience encompassing issues with difficulties self-assessing performance. Failure challenged their self-perception as academic high achievers and forced them to confront the practical implications of failure to persist on the course. These experiences were intertwined with the negative emotional effects that accompanied failure, which were often internalised to protect themselves within a competitive environment resulting in a degradation of their mental wellbeing.

For some, these effects persisted, reducing their confidence in ongoing assessments, their beliefs about their ability, and affecting how they considered their future career aspirations. However, failure was also perceived positively and acted as a catalyst for change; a moment in time that culminated in the need to reflect on their approaches to learning, seek support and change their behaviours. An interesting finding was that not all failure was given equal significance: failure in assessments with a clearer link to perceived future job roles provoked greater self-reflection resulting in greater behaviour change. The eight subthemes are explained and illustrated below.

5.1.1.1 Subtheme 1a: Failure is a new experience

Six of the eight participants failed one or more assessments during the course. Some anticipated the outcome, attributing it to a poor performance on the day or poor preparation. However, for others it came as a surprise, and was the first time they had considered they were struggling academically, as described by Theo:

I think I only realised, I only realized, when I hadn't passed the assessments, something's going wrong? I wasn't sure what. So it didn't feel like I was struggling necessarily. (Theo)

Simon highlighted the difficulty he found in self-assessing his performance when describing his OSCE in third year:

And then the only station I thought I did well, was the diabetes counselling station. And that was the one that I actually failed in the end. (Simon)

Part of the difficulty these students have with understanding their failure is the belief that effort and outcome are synonymous: the more effort that is put in, the better they believe they will perform. Thus, results that did not match the perceived effort, as Nigel stated, felt unfair and were difficult to rationalise:

It just felt really, it just felt really unfair. Because I felt that I put everything I could in terms of my effort and my energy into the year into, into, into the academic process. I, I felt like I was I

was engaging as much as I can, as well as much as I could have done throughout the year. And it just wasn't coming off. (Nigel)

5.1.1.2 Subtheme 1b: Failure challenges students' sense of self

For many, failure was a new experience which made them question their prior self-perception as academically high achievers. This was most impactful for Nigel, who as a postgraduate found it even more challenging coming to terms with this first experience of failure having managed to successfully navigate both secondary education and obtain a prior degree:

I'd done a degree previous[ly], you know, I did a...degree previously, and I managed to get through all of those fine. (Nigel)

This made the experience of failure more confusing and harder to understand, leading to him questioning his academic abilities: his use of the terms “stupid” and “not good enough” highlight the extent of this self-critical questioning:

At that point, because I felt, that I was, I felt that I should have been doing okay, at these assessments I should have been, and then I was like, “Well, I'm not. Why am I not?” And then and then, that then turned into a bit of a, “Well, you're, you're probably a bit, a bit stupid, then you're probably not, not, you know, maybe perhaps not, not even good enough”. (Nigel)

As he describes later in his narrative, he had to reassess his sense of self:

Certainly that mind-set has. I think, yeah. The kind of “I'm academically gifted” I'd have, I think that's, that's dissipated quite a bit, because I just went to a, it was a state school,... and it was kind of like, you know, just, you know, there wasn't, there wasn't a few, there wasn't too many of us who are getting, you know, lots of lots of As and lots of stuff. And then obviously, you're thrown into this environment where, you know, everyone is of course, super smart, so then I've kind of had to readjust the barometer on that regard. (Nigel)

Theo reiterates this sensation of inadequacy and the difficulties coming to terms with struggling academically:

I'm quite ambitious anyway. So when you don't pass assessments, kind of like, “why didn't I pass?” You know, I mean, and you sort of question yourself, and you're sort of questioning why you did not pass? Questioning whether you're good enough? ... And umm, sort of struggling through that. And so I've kind of, I've just come to the realization that you, that you're kind of, are struggling almost. And you're not sure why? Yeah, it's quite, quite a, err, yeah a hard process to go through. And quite a, err, yeah. difficult one if that makes any sense, basically. (Theo)

5.1.1.3 Subtheme 1c: Failure is difficult to discuss

The participants withdrew to various extents from their support networks of family, friends and peers, as they found failure was difficult to disclose. In attempts to understand and manage their experience of failure, there was a tendency to internalise the problem. This impacted help seeking behaviours, as described by Theo:

Umm, if I'm honest, I'm not sure I coped with it too well. Well, I think I, well, I mean, cos generally, I tend not to share too many things. So I, I might not share, what's happened. I just sort of analyze things myself, and try and figure out where I went wrong. (Theo)

The awkwardness of discussing failure with friends who had passed led to Nelly minimizing the experience - she “made light of it” and “brushed over it” in order to save face:

I think they kind of made light of it a lot. Um. So I sort of, like I'd obviously mentioned it, but it was just sort of like, um. I kind of I tried to make it, so it was quite small, I was just gonna do a re-sit, it's fine. Um. Make sort of as little, deal of it as possible. And I think, because they'd done so well, they were kind of like, well this is a little bit awkward and kind of brushed over it quite easily. (Nelly)

This limited her utilising her friends as a source of academic support, despite appreciating the benefits they would provide out of fear of being a “burden”:

I felt a little bit uncomfortable about perhaps asking for help that time around because they'd done well. And obviously, they just want to enjoy their summer holidays. So, you know, whilst the group would have been quite a good resource for me to be like, “Oh, do you mind going over that topic with me?” I wasn't going to do that. Because I felt like I'd be a bit of a burden, I guess. (Nelly)

Theo described how his tendency to internalise managing his experience meant that his reflections were limited to simplistic explanations of his failure such as picking the wrong case or nerves getting the better of him. This led to multiple subsequent failures and the need to re-sit the year, which eventually led him to consider and change his approach to learning:

Maybe it's, you know, just nerves or maybe I just didn't pick the right case? Or maybe I just didn't do things right. If that makes sense? So yeah, I wouldn't say I dealt with it in the best way if I'm honest. But yeah, just sort of tended to. Yeah. At, at first maybe not say anything, and just sort of, figure things out. (Theo)

The impact of failure in repeated assessments - which provided more beneficial, profound reflections that resulted in greater behaviour changes after seeking support - is described in more detail in subtheme 1g.

5.1.1.4 Subtheme 1d: The Negative emotional impact of failure

The negative emotional response to failure is unsurprising, and was felt by all the participants who had failed. Failure was described as “devastating” accompanied by feelings of “shame” and “embarrassment”, affecting their self-worth. This was clear in Theo’s account of how failure affected his evaluation of himself:

Yeah you just feel, you're kind of almost, I won't say worthless, but it, I guess it does eat a little bit at your umm (sigh) ego, self-esteem. Again, because we are, I guess generally, I don't generalize, but ambitious and relatively intelligent, I guess. So. Yeah. It's hard. Really difficult, actually. (Theo)

Mental health difficulties and academic performance have been linked in multiple previous studies.^{8,9} The participants described a cyclical relationship in which poor academic performance impacts mental wellbeing and mental health difficulties impact academic performance. Mental health issues were a central component to the narrative for the majority of participants in this study, some already had mental health conditions prior to commencing on the course and others were diagnosed during the course. The narratives in this study highlight the wide variation in ways mental health difficulties impacted participants' abilities to study and perform in assessments. For some, mental health difficulties were exacerbated by the stresses of the medical course and anxiety evoked by the intensity of assessments:

It's like, so it's a bit, I'm sure you know, like the dark cloud over you that just gets heavier and heavier and heavier. Until it's like, do the exam, get it done. But, I often, umm like with my previous mental health problems and things, I get very worked up. And sometimes I get a little bit paranoid. Umm, and I think it's just the way that my mental health condition manifests itself when I'm stressed, but, usually exams and revision, and those few weeks before an assessment like that. It's really intense. (Jem)

For others, mental health difficulties impacted their executive function leading to difficulties in initiating tasks such as revising for their assessments and the subsequent failure strengthened their prior negative perception of self. The repeated patterns of dysfunctional behaviours are common in mental health disorders³⁸² and can impact the ability of individuals to access support:

I think it's almost like a by-product of kind of mental health stuff, just that kind of sense of like executive dysfunction, but you just can't do it almost and is, there's no logic to it at all. Like I know, if I do it, I'm going to feel better about it. it's like going to a gym or whatever, isn't it? It's like, you sort of feel like, I know, I'll feel great after I've done it, but I just can't. And then I suppose it's then sort of feelings that come from that, then you sort of ruminate and think, Oh, I'm so useless. I can't even get started. And then it sort of feeds itself almost, because then you put yourself even further back than you started. (Nelly)

One may argue that procrastinating, anxiety, and poor concentration are within the normal continuum of difficulties all students face especially leading up to high stakes assessments. However, on the more extreme end, participants described how they perceived anxiety associated with the course and poor academic performance as a causal factor leading to substance misuse issues (Jem) and the onset of symptoms subsequently diagnosed as post-traumatic stress disorder (PTSD) (Violet). Given the seriousness of both situations, both intermitted for a year in order to access the formal psychological support they required. Violet described how the experience has changed her actions, emotions and sense of self - her reference to "watching somebody else" suggests both the value of taking an external perspective oneself, but also the fact that this can be quite confronting:

The magnitude or the fact that I could see how different my emotional responses have been, since the whole experience umm, umm. For somebody who's very rational, and very cynical and very matter of fact, suddenly, irrational responses on my part were completely, it was

like watching somebody else from a, from a distance. And yeah, I was sort of like telling myself, just, you know, get over yourself, or get your shit together. But Yeah, it wasn't easy. (Violet)

This impacted the ability for her to rely on coping mechanisms she had developed to deal with stressors in her life leaving her more vulnerable and in need of professional support.

5.1.1.5 Subtheme 1e: The negative effects of failure can be long lasting

Unfortunately, failure often had long lasting effects, causing some participants to feel stigmatised, even years after the event and despite ongoing success in other assessments. Paul - who failed an assessment in his second year and has now qualified - described this as “a chip on my shoulder”.

For Simon, the consequences of prior failure also had ongoing effects, re-enforcing his self-doubts about his academic ability and strengthening his negative self-perception that limited his capacity to absorb positive feedback. This made it difficult for him to reposition his self-perception from a student in difficulty to a high performing student with internal expectations of success, reducing his confidence especially when approaching ongoing assessments:

I've always had doubts on my knowledge, like, even if I'm, even if people have reassured me that I am, right. I'm doing everything correctly. In the back of my head. I'm always going to myself, because I've lost all the confidence I used to have before that. (Simon)

The potential and real consequences of failure - either re-sitting the year or removal from the course - were understandably anxiety-provoking for the participants. All of the participants, regardless of whether they failed, considered whether medicine was the right career choice for them as described by Simon:

If you're like me and you're struggling, then it's like oh I'm not even good at this anyway. So “why am I even here kind of thing?” Yeah, that's, that's why it affected my motivation kind of thing, or affected the way I felt about medicine. You're like, oh I'm sure if I should really be here or I'm not sure if I, this is a career for me. Or the reasons why I set out to do this in the first place haven't materialized or they haven't. I'm not sort of realizing them. So it's kind of like I guess of course “why, why am I here?” (Simon)

Failure and ranking also had an impact in how they considered their future career aspirations. There was a tendency to self-impose limitations (this is discussed in detail under ranking).

5.1.1.6 Subtheme 1f: The practical implications of failure

Failure was not solely experienced as an existential crisis for those participants who had to re-sit at least one year and the two who had to intermit for health reasons who had to confront the reality of potential removal from the course. This reality created tangible fears for their career and

in Nigel's case, the need to fight to remain on the course and prove the medical school's position and view of him as wrong;

I went and sat down with the phase lead at that point, and the kind of the admin person and they said, Well, you failed at a second attempt, there's, there's nothing we can do. Like you should just leave really, you should just leave the course ... And I kind of, and they were saying all that and I said but and you know, and I've read all the, the stuff online, I said but, but nothing gets decided does it until, until July, until the exam board and everyone meets in July does it there's no formal decision now ... I said, Well, I'm going to carry on and I'm going to pass everything else this year. And then I'm going to appeal at the end of the year. Which, which, which I did. And, um, yeah, and then that was all, that was all fine. And I, I got kind of, yeah, yeah, continued, continued on with it. But yeah, obviously that, almost, it almost positively affected my motivation at that point because it was very much like, okay, you basically said I'm not good enough to be here and it was kind of, I was very much like, well, I'm obviously gonna prove you wrong now, aren't I, so. (Nigel)

Medical schools have a dual role as both a support structure and gatekeeper to a career in medicine. This role has predominantly been perceived by students as punitive and intimidating which is reiterated in the accounts in this study as described above by Nigel who developed an adversarial relationship with the institution. Theo noted that importance of feeling cared for and found the response of the institution was unsympathetic making a difficult experiences more challenging:

I think it's quite hard because obviously they're trying to say it how it is, but maybe it felt as if it lacked some sympathy almost or some, err, I don't know, care, but I don't mean anyone particularly or the med school, it is just I don't know. It's, it was a bit (sighs). It's hard, at the time I felt like, it felt like, I don't know why, but it felt like no one cared, if I'm honest. (Theo)

For participants who lacked financial security, the fear and anxiety of failure was amplified due to the financial consequences, for-example re-sitting a year, which was described by Katie as simply "not an option":

A lot of my motivation to like get through and pass is because so much rides on it financially. Like when you've got to pay £9000 pounds a year on your own. That's really shit. So failing a year isn't like, isn't an option. (Katie)

5.1.1.7 Subtheme 1g: Not all failure is equal

Participants' accounts indicated that not all failure was felt equally. Failure in the preclinical years produced less of a profound reflection on their sense of self or learning style and was easier for those participants to rationalise. There was more of a tendency to attribute their failure to poor time management/organisation and external commitments which they had prioritised over studying, rather than their academic capability. Some interviewees described their revision as "too little, too late". Participants tended to consider failure in the clinical years as more impactful. This mirrors the differing importance participants gave the pre-clinical years compared to their

clinical placements. Preclinical years were commonly described as a hurdle to overcome and not relatable to the job of being a doctor, whilst clinical years were considered “real” in that they were reflective of the participants’ future job roles.

Some students suggested that their academic difficulties in preclinical years may have arisen from a lack of engagement with material that was not perceived to be directly relevant to medical practice. For example, referring to some scientific subjects, Nelly said “I can't see how I'm going to use this in practice”. Paul reported similar feelings, but expressed them with broader reference to the two pre-clinical years:

Okay, yeah, I'm a first or second year student, but I think I've got like, I can't see how this translates into the real world of medicine. I think that those are the bits that I really struggle to engage with. (Paul)

They both discussed failure in the past tense, and although the stigma may have remained, they no longer perceived themselves as academically struggling. For example, Paul described being happy with his academic performances despite not improving his decile attributing it to the less important assessments that contributed to the score, this is re-iterated by Nelly in subtheme 2c:

The big exams were, which I was doing alright in and I was happy with my performance. Erm, yeah. I think at times, it was some of like, small events that led me down. But those small bits sort of add up to, to big bits. (Paul)

Paul’s main driver for being involved in this study was to share his experience of being able to “take something positive out of an inherently negative experience”, citing the importance he places on failure for helping him change his learning behaviours and mentality:

In many ways, I do think I needed that I needed that sort of shock, that sort of like, kick to get myself like going and to actually like be a good med student. And I don't think that's like, I ... I don't think that I would necessarily be in a position. I am. Now, without it. I ... I umm tried to be quite philosophical about these things. And think actually, from that, I learned how best to revise for me, I began to do like, especially in certain, err, types of exams and stuff like that, a lot better than I was doing (Paul)

There was a perceived lack of structural alignment between earlier and later phases of the course. Interviewees often found it difficult to relate the content being covered in preclinical years to their future practice of medicine, and this affected their motivation and engagement. In some cases, this misalignment was protective in that it did not lead to participants questioning their ability to perform as a doctor. This contrasted with Simon’s concerns that failure in year three which he perceived as ‘core’ material in his journey to becoming a doctor:

So I started questioning myself about whether I wanted to continue, whether I'm actually going to make it to the end. Especially because the three [year three] is quite a solid, like full of core stuff. So, I was like, “if I can't do it now then how am I going to do finals?” (Simon)

Interestingly, Nigel - who faced multiple failures in both preclinical and clinical years - mostly

focused on how failure in clinical years impacted him and his sense of self and did not give the same gravitas to failure in preclinical years, discussing them as an afterthought when asked about whether he had failed any other assessments.

In addition, failure in assessments that were perceived and described by other students as easy was harder for the participant to come to terms with. Both Theo and Violet commented that failing their case based discussion assessment (CbDs) was considered unusual and uncommon amongst students and faculty:

So yeah, yeah me stressing to find a case, and then everyone's like, I think during the process, what happens you'll be fine. You'll be fine. Like everyone passes anyway, it's fine. (Theo)

In attempts to protect their sense of self when confronted by failure, in what is supposedly an assessment everyone passes, there was a greater tendency to externalise the cause, blaming a lack of guidance, the subjectivity of the assessment, and the examiner:

The consultant who was the examiner on the day. So basically, umm, not many people fail those things. But I feel like everybody who fails in psychiatry fails with this guy. So. And he was horrible throughout the presentation (Violet)

Finding a case, they don't give you, I feel like they don't give me, give me much guidance, to find a case and what exactly is a good case? Well they, they do tell, tell, but, but, about what the case isn't. It's so much about someone's interpretation. And there's so much subjectivity, subjectivity." (Theo)

That is not to claim that externalising failure was unique to those participants, as they all had a tendency to externalise the focus of their poor academic performance in order to protect their sense of self. However, the degree to which this was done was apparent. Commonly cited causes included: Unfair examiners, unfair OSCE stations, poor supervision on research projects, bad luck on the day, poor performance due to nerves, unclear instructions about the assessment or assessment modalities that didn't play to the participants' strengths. Interestingly, when describing these factors there was no consideration that they would have been universally experienced by all students, including those who performed well in the assessment.

The difference between Theo's and Violet's response to failing CbDs highlighted the impact multiple failures had on Theo in comparison to Violet and how a lack of self-reflection impacted help seeking behaviours. Violet failed a single assessment and attributed it to a "lack of information of what was expected" and the unfair examiner as described in her account above. There was no reflection on her approach to learning with further explorations of her beliefs behind her performance centred on physical health issues she was experiencing and the error in not rescheduling the assessment:

The few people that I was close with, and they said, "Oh, why didn't you reschedule? If you were not feeling up to it on the date, you should have just rang them." And I said, Oh, you

know, being the kind of person who always meets deadlines and pays the bills and sort of you know, umm (sigh) I said "What do you mean reschedule? Can you just reschedule an exam?" (Violet)

Throughout her account she portrayed a palpable lack of trust in the medical school, for example describing the belief that curriculum was primarily designed to benefit faculty professional development over student needs, that prizes were disseminated to meet the political needs of the supervisor, and that widening participation was a programme not intended to support the students it attracts. This cynical framing of the medical school was solidified when she accessed support and perceived that what she was told and what happened failed to meet her needs:

I met with student support. That's when I lost faith in the practical application of student support. So basically, umm, they kept saying, or the school office kept saying that, you know, don't worry about it. We'll, we'll help you don't worry about it. And then in the end, I think that I had, umm, one signature missing in my logbook. And that was something like, present or discuss a patient with, it was something really, really minute, something really, compared to all the other things, and they made me go back and get that signature. (Violet)

In her case, seeking out support and remediation were not considered due to her perception that the cause of her poor performance was external to her and she positioned the medical school as an unfair and unsupportive institution. Theo conversely (as alluded to in subtheme1c), initially externalised the causes of his failure before multiple failures, resulting in him re-siting the year which led him to actively seek out a wide range of support to address his learning approach:

*I went into my set my re-sit year with a different sort of mentality. I guess, maybe more, a bit more motivated, having like a, almost a fresh start ...
... In terms of support, yeah, so the range of different support, actually, especially during my second time I did third year, so like I said, people in the year above, just running it by them. Other friends in my year as well. Um, yeah what else, sometimes I would go up to the doctors on the ward and, and um, like just talk about my case, and just see if they thought it was a good case and how to approach it. Some of the doctors, or F1s, at least, went to BSMS. So they were quite helpful in that. And I was quite fortunate, but I had, um, there was a, a guy from my church actually who was a, or who is sorry a doctor or a GP. And sort of mentioned stuff. Mentioned I just talked, spoke to him about how I was struggling and he offered to help with my CbD cases and stuff. (Theo)*

5.1.1.8 Subtheme 1h: Failure has its benefits; The catalyst for change

Failure has a number of negative impacts on participants. However, failure carries a duality of negative and positive effects. As touched on by the accounts from Nigel, in subtheme 1f there was a duality in the way in which failure impacted student motivation to persist on the course and qualify as doctors. Failure made the participants contemplate a career in medicine and cast doubt on their ability, questioning whether they deserved to be there in the first place which fed into their belief that they were undeserving. Nelly described this sense of "guilt" at having taken the place of a more able student, referencing her lack of attainment of the requisite A-level grades at

entry to medical school. She also used the term “imposter syndrome” which is defined as a ‘psychological pattern in which one doubts one’s accomplishments and has a persistent internalized fear of being exposed as a fraud’³⁸³:

The idea that, again, sort of that imposter syndrome, I guess isn't, that, I mean, that I'd sort of, I'd missed one of my grades for getting into medical school, but I've got accepted anyway. And so the idea that perhaps some, somebody else who should have been in that position instead of me, and I've kind of taken their place. Um, so, yeah, kind of guilt I guess. (Nelly)

However, confronting failure was also a positive motivator, as it provoked participants to prove to themselves and those in a position of power at the medical school that they had the required ability to complete the course and have successful careers in medicine. For example, Nigel interpreted the judgment at the meeting with academic staff that questioned whether he should remain on the course as a challenge that he was going to prove incorrect:

Obviously that, almost, it almost positively affected my motivation at that point because it was very much like, okay, you basically said I'm not good enough to be here and it was kind of, I was very much like, well, “I'm obviously gonna prove you wrong now, aren't I.” (Nigel)

Failure, re-sitting assessments, or repeating a year tested the strength of the participants’ motivation to be a doctor. Such experiences tended to provide more impetus to succeed. For example, this was noted above in theme 1g by Theo, who described his re-sit year as a ‘fresh start’ and entered it feeling ‘more motivated’.

In addition, reflecting on why they had not been successful led to participants questioning their learning practices and seeking out support for ways to adapt and develop them. They did so in a number of ways, both through formal and informal pathways. For some it was the act of failure that ‘shocked’ them into changing how they prioritised their work over other commitments, for others it was acquiring new learning practices from peers who had successfully passed the assessments.

Some were offered formal support from the medical school that provided new approaches to learning, boosted their confidence, and helped them become more comfortable in the clinical environment, so they could take more control over their own learning. With the help of a teaching fellow and senior peers Theo attributed his eventual success to learning how to learn and utilise resources appropriately:

Really learning, learning how to learn medicine basically. And I think I've done that much better. And know what I, at least know what I need to know and know what I don't know and kind of thing. (Theo)

Simon found the regular one-to-one sessions with a teaching fellow, designated by the medical school, provided the re-assurance he was learning appropriately:

I think that was plenty for me to kind of get back on track. Because a lot of it, I had to go, I mean, I did a lot of revision myself as well. But it was useful to go back and speak to someone about if I'm, if my understanding and things are right, and my reasoning, my thought processes, reasonable and things like that. So I think having that reassurance was, was the most helpful part. (Simon)

As discussed above, failure was often difficult to disclose (subtheme 1c), especially in an environment that is perceived as competitive. This results in participants believing they are in a unique situation when confronted with failure and re-sitting assessments. Nelly described how it only became apparent that failure was not as uncommon as she believed during her resit assessment:

I think like when I went to the re-sit, and I saw everyone else who was doing it, I was like, wow, now I knew there are a lot of, but a lot of them I know. And I didn't realize that they were really, even re-sitting. So, yeah, the first time I realized was then. (Nelly)

Knowing of others that had failed was re-assuring for participants who had failed as it reduced the stigma and the knowledge that others had been able to persist and succeed made them feel less despondent:

But they're always [student support] being, umm, reassuring and they say, you know, they're just telling me like, it's not, it's, it's not, it's not just me, like other people have been through this and they still come out and passed and things like that. So that's really helpful. (Simon)

However, Nelly believed there was a missed opportunity; the lack of awareness of other students who had failed prevented the development of peer support and resulted in learning in isolation:

I think it would have been perhaps, been helpful to have more opportunity to kind of connect with those people. Because, again, you're all in that situation, whether it's helpful to put in, you know, group revision programs, or whatever. So you're not just at home by yourself kind of, again, going through that process without any support from your kind of peers, I guess. Um, so yeah. I think it would be nice to have known about those people a bit earlier, or at least have the option to know. (Nelly)

5.2 Theme 2 The spectre of ranking and its negative consequences

The negative consequences of failure were reflected in the narratives the participants gave about their decile ranking. However, whilst failure carried the potential of positive change, this was not shared with their experience of the ranking process. Ranking is the process in which students are provided with a decile score computed from multiple assessments during the course. This starts in the first year of the course, with weighting of the assessments increasing as students' progress into the clinical years. However, the participants in this study found the system opaque and challenging to understand. Complex calculations are required to understand the amount each assessment contributes to the overall decile score as evidenced in the methods chapter.

Additionally, as ranking is an overall score that is computed relative to the cohort, movement

between deciles is possible, but it can be difficult, as described by Paul in subtheme 2c.

5.2.1 Subtheme 2a: The obsession with ranking

Whilst one might expect an experience of overt failure with the potential stress of removal from the course accompanied by the potential loss of a future career to be more impactful than ranking, but this was not the case in the narratives discussed in this study. For example, Nelly describes ranking as “the thing that really matters”:

I suppose it's like when you pass, and you're still there. It's like, Oh, well, I've done better than I did last time, but nothing's changed with the thing that actually matters, you know, doesn't matter whether I pass medical school or I fail. Ultimately, I have to pass at some point, but our rankings is the thing that will determine where you go and everything afterwards. So that's the thing that actually means something, it's like your 2.1 or 2.2 or whatever. And yeah, that doesn't reflect the fact that I've improved. So I think it does a little bit in that sense, just kind of frustration aspect. (Nelly)

Failure was mostly discussed as an event in time. This meant that in the participants' narratives there was time to reflect on a singular or multiple events which allowed them to process the experience and identify potential positives. This is why some participants were able to discuss how they managed and in some cases overcame failure to become successful in future assessments. This success in future assessments and positive feedback from clinicians and patients was a protective factor in their ability to develop a professional identity aligned to their capacity to perform the role of a future doctor. Supplementing this was that some failures were less impactful if they occurred in assessments that were not deemed to be reflective of their ability to be a doctor. However, because the ranking system is an ongoing process that accompanies the participants throughout the course it can become more instilled and central to their identities. As such, time is perceived as a healer in relation to failure, but becomes more problematic in relation to ranking: the identity of someone who academically struggles is solidified with regular reminders of their position amongst their peers. Paul reflected during the interview that although he had originally discussed failure as leaving a chip on his shoulder, it was actually ranking that left the greater mark:

See, it's weird when we talked about the failing an exam? And how about that I always, I said, I've got a chip on my shoulder from failing that exam. I don't think that's necessarily true. I think I've got more of a chip on my shoulder about my rank, my decile ranking, because I never felt that it truly reflects, umm, my, (pause) like, sort of my knowledge or abilities, whatever word you want to use. And it's always I think that's probably the thing that I've almost be more embarrassed about. (Paul)

Other participants emphasized quite how impactful ranking is within the student population. Nigel described students being defined by their ranking:

I think maybe, maybe the kind of, the thinking is there in terms of defining them. I think it's, they kind of define themselves as where they are. I just think, you know, there's a, there's a lot of people who, who, who struggle or a lot of people who, who value themselves based on their decile. (Nigel)

Violet and Katie both described ranking as an obsession:

People are obsessed about ranking. Umm. Like, it's just this unhealthy obsession (Violet)

5.2.2 Subtheme 2b: Ranking as Taboo

Although the quotes in the previous section illustrated the perception that everyone is apparently “obsessed” with ranking, there was an even more apparent lack of disclosure about one’s ranking within the cultural norm of the medical school. As Jem puts it;

They don't say, because it's low. Or they don't say because it's high, and they don't want to seem, like, big headed. I don't think it's very useful. People just inwardly struggle with it. (Jem)

Even broaching the subject could be viewed with suspicion, with some individuals wary of why others would want to know about their decile ranking:

I felt, how would I be comfortable with this person knowing? I think the majority of people I'd be a bit suspicious of. And probably would be like, yeah, like, why do you want to know? (Paul)

Whereas most of the participants may have downplayed the impact failure had on them to their peers and friends, and describe the awkwardness associated with discussing the experience (subtheme 1c), they were open to doing so when they sought out support. Ranking however, was not an accepted topic of discussion amongst friends/peers at the medical school regardless of where one placed:

It's all a bit hush, hush. I feel like people don't want to. People don't want to upset other people by saying oh I'm this rank, what did you get. Um, I feel, you know. Even my friends are like, they won't really talk about it. And I'm like, you guys, you've got degrees in biomedical science. You know, you've got a, you, you're very good at all the academic stuff. (Katie)

Participants seemed defensive when discussing ranking. There tended to be an incongruous narrative in which they initially downplayed the importance of ranking to themselves before directly contradicting those sentiments as the discussion progressed. One of the defence mechanisms was to open the discussion about ranking as what they perceived the view of the student cohort was rather than its personal impact. As the discussion progressed they became more reflective and appeared to disclose more about their own opinions. Theo initially states “I don’t really care about it if I’m honest” when first asked about ranking and then discusses the impact of ranking for a large section of the interview, finally concluding:

I guess it's a little bit counter, contradictory to what I've said before, given that I said I don't really care about my ranking. But a certain extent I, I do a little bit. Or I do quite a bit, just because when you know something counts towards your actual grade, you definitely want to put more effort into putting, yourself in better light on or in a better way. (Theo)

The wind down questions clarified that the students would not have felt comfortable discussing their ranking had I, as the interviewer, been a fellow student, further strengthening the implicit understanding that this is a cultural faux pas.

5.2.3 Subtheme 2c: Ranking is difficult to learn from

One of the consequences of creating a longitudinal ranking system, whilst not intended by medical schools, is that students utilise it as a feedback mechanism to help gauge their performance. As it has not been created or intended to be a feedback system it is challenging to learn from. For example, the opacity of ranking made it difficult for participants to rationalise their decile score:

I just I don't understand the algorithm that goes into it. I think also I forgot about a lot of different components that added to it that, I can pick out like say from third year onwards like big like KTs and like the knowledge tests, or OSCE's I tended to do alright, like always around like middle of the pack to like, fairly well, erm, so in my head, oh, I must be like climbing through the rankings the whole time and I wasn't I was just staying stagnant in the end. (Paul)

The only consistent positive factor attributed to ranking by participants was that it acted as a motivator to encourage participants to do better in attempts to ascend the ranks. However, this was considered more important to students who were competing to be in the top deciles. Furthermore, what 'doing better' was, was unclear. Students receive feedback on the individual assessments that contribute to the ranking score but there is no additional actionable feedback that accompanies the rank as it develops throughout the course to guide these efforts. As Nelly explains it does not add any tangible understanding of why she was placing in that position and as such was of limited use to her as a tool for learning:

So I think it's, limited from our perspective, in terms of what it tells you about yourself or anything, you know, ultimately they have to assign a number, it's just a practical thing. (Nelly)

What makes it even more difficult is the lack of change, or even descent in the ranking score that left participants feeling deflated resulting in a net negative motivational influence on their studies. Paul describes his difficulty in understanding why he fell in the ranking score despite performing well in his assessment and how this took away his confidence:

I got the median mark and yeah, I went down the decile. I, it just like, that was earlier this year. I can't remember it was must be like October time, and it completely knocked me. I was

just there like, Well, I've got like, what should be like a fifth decile score in this thing, and yet I've slipped down a decile. Oh, and if anything, I had prepared myself for two scenarios. Either I go up one or I stay the same. And I hadn't even considered the fact that I could go down. And then I, it ... it really knocked my, my confidence. (Paul)

Nelly reiterated this frustration with lack of change in her score despite her perception that she had improved and was now a better student:

Again, that like, you know, obviously, I've got better as I've gone through medical school as well, I, I feel. I feel like I'm a much better student than I am, was, was in first year. And yet, the decile doesn't necessarily reflect that. I still am, you know, more or less in the same position as I was then. So I don't think it necessarily demonstrates that growth, which I think is a little bit irritating sometimes. (Nelly)

Linked to this was the unfortunate consequence that ranking removed the positive enjoyment and pride of passing the assessment and the sense of achievement in performing well in ongoing assessments:

Umm, I don't know. It's all good passing and things. But when you compare it to the rest of the year group and someone says, actually, you're in the worst 10% of these, it kind of detracts from the fact that your^[sic] passed. (Jem)

5.2.4 Subtheme 2d: Ranking feels unfair

Overall, the ranking system was considered unfair by all participants, but for various reasons. There was a sense that ranking did not capture the journey and difficulties students had to overcome on the course which meant participants felt as though they were continually being punished for prior poor academic performance. This felt inherently unfair, especially when the academic performance was attributed to external causes that were not acknowledged, as described by Jem:

It is a difficult predictor to use. And then, like, persons such as myself you know, I have had a lot of things happen to me outside of med school, that have definitely had an impact. And I would have done better but, you know, life happens. I think it's just not very accurate. (Jem)

Violet, similarly, felt aggrieved that the system did not take into account the limited available time she had to study due to the need to support herself financially and obtain paid work. She believed that her relative academic performance and lack of failure was “impressive” given the obstacles she had overcome:

All I had was to literally the two weeks before the KT do any revision at all. So I feel like the fact that I never failed an exam was good. And I'd say it's probably quite impressive compared to, again, it's not I'm not trying to compare myself to other people, but thinking about people who didn't have to work and lived in on their own in their own houses. And umm, were quite comfortable, and they failed or failed twice and had to repeat the year and things like that. I would say that my results are quite impressive compared to that, considering the fact that, as I say, I didn't really have any time for revision. (Violet)

There were also concerns about the lack of standardisation of assessments that formed the ranking score both within the institution and across institutions. There was a lack of clarity regarding how the institute made decisions on which assessments were included, as well as how and why weighting was attached to differing assessments, and this opacity led to the perception that the process was unfair. Some of the assessments were perceived as subjective experiences in which there were concerns raised about the standardisation of the experience and the marking of the assessment as Paul eludes to when describing an essay that formed part of the scoring system in his second year:

The essay was, was talking about how they engaged with different, um, different services in the community apart from, um, the GP, and this patient just didn't (emphasised). And, um, and err, and I sort of wrote the essay, as I saw fitting, and part of my feedback was, oh, you should have talked about all these other services. And I was like, well, this patient didn't have any other services. And so like where as other people who have really interesting cases have a lot more to write about. So I think at times, there's a very, like that, there is a subjective, err, element to it, there's quite high that, obviously, there's going to be some level of subjectivity, because you've got different markers. (Paul)

Participants were also frustrated at a perceived lack of standardisation across institutions regarding how decile scores were calculated and what assessments were included. Participants couldn't reconcile being compared across institutions with completely separate curriculums and assessments as described by Simon:

Because we're all supposed to come out with the same degree. And at all medical schools. Even though we have different ways of teaching, we're all despite, despite the rankings, we're all supposed to be seen as the same from across the whole country but if we are being examined in different ways then it doesn't make sense. Um. So yeah, I dunno, I think that's probably the first thing I wanted. I'd expect them to standardize how long we have each station and how to do it. (Simon)

The validity of the decile score was also questioned. For example, Nelly questions whether placing in the bottom 10% in one institute correlates to the same decile score in another:

Yeah, cos I mean, ultimately, if you, if you ranked everyone in the country, medical student wise, if you're in the bottom 10% of your university doesn't mean you're going to be in the bottom 10% of the country. So how useful is that anyway? (Nelly)

Beyond this ranking was universally felt to be too limited a metric of an individual's abilities and therefore was not a true reflection of their abilities or the skills they perceived as important in being a doctor. Katie suggests that the score doesn't account for her strengths that have been picked up in the positive feedback she received from patients and clinicians in the clinical environment:

You know, we've all got strengths and weaknesses. Mine is not necessarily on paper; my strengths are not all the written stuff on paper. My, yeah. So do they take into account the positive feedback you get elsewhere? Does that bring it up? No. It doesn't play an impact, it's pretty much just the, yeah, it's just like the assessments, isn't it? (Katie)

Other participants expressed similar feelings towards ranking using terms such as “artificial” (Theo) and “pointless” (Simon), noting that it did not reflect their “entire career intelligence and character” (Nigel).

Ranking played a significant role in the production of a professional and academic identity and one of the only ways to process their decile score was by rejecting the system. Framing it as unfair and not demonstrative of their true abilities allowed them to bracket it and take a pragmatic view of the purposes of the system to persist and remain motivated.

5.2.5 Subtheme 2e: Managing responses to ranking

Many took a pragmatic, if somewhat defeatist, approach in attempts to moderate the impact of ranking on their self-esteem:

Ultimately, you know, a 10th of the year is going to be in whatever decile so it's kind of just this acceptance at this point that. Whatever decile I'm in ultimately it's, you know, 10 points or whatever it is between top and the bottom, it's kind of somewhat inconsequential. So what's it mean? (Nelly)

Ranking was perceived as out of their locus of control once they had performed poorly or failed, and therefore their energy would be better spent on focusing on optimising their future performance. Theo describes how he tried to compartmentalise and dismiss the importance of ranking but still motivate himself to perform as well as he can:

Now, I don't really care if I'm honest, like, it might depend on where I end up in foundation, I'm not really all that bothered any more. Just because there are better things to worry about, more important things to worry about than, than my ranking ... The thing is, when you do it, someone has to be nine or tenth decile or last and someone has to be first. And you can't change that, that, whatever you do. So. Yeah, sure everyone wants to do better. But there's gonna be someone who definitely is going to be like last, if that makes sense. And that's something you can't control. That's why I have always resigned to the fact that okay, you know, I can't. I can do my best that I can. (Theo)

All of the participants were aware that the ranking system influenced their chances of getting their foundation jobs within the geographical area they wished. This was a source of anxiety for some. Interestingly, the reality about the amount of points allocated between deciles made participants feel more re-assured. The whole purpose of the ranking system itself did not appear to be the principal cause of stress and anxiety, but rather the impact it had on their sense of self, which was far more profound. This impact on their sense of self and identity influenced what specialities within medicine were achievable. Theo describes his concerns about being a suitable candidate to pursue a career in what he perceived as competitive specialities:

I think when I was struggling, you kind of just want to go for like, what's been perceived to be the easiest thing, kind of thing or you don't want to like for example, I don't know, how do I say? Like, I don't know, I think certain things are perceived as hard, like cardio, I guess and like other things, that if you're struggling, if you're in like in the lower ranks, you can of like ah, this, I don't think I can do that, sort of thing. (Theo)

5.2.6 Subtheme 2f: Do we need to breed more competition?

Interviewees suggested that by pitting highly academically achieving students against each other, the ranking system created an even more competitive environment:

It's a competitive environment, environment already. And it's like, it's just, and just feels like another way to, to kind of separate people and, and pit them against each other. (Nigel)

This was perceived as creating an unhealthy mentality in which self-worth was attached to how they performed relative to their peers rather than their own achievements:

I think that it feeds into that competitive thing of the idea, you're not competing against yourself to be the best person, you're competing against everyone else to kind of prove yourself or whatever. And I don't think that's particularly healthy necessarily. (Nelly)

Theo draws links between how ranking contributed to the competitive environment at the medical school and the deleterious effect this has on the mental wellbeing of students:

I do think it definitely does breed a lot, a lot of competition, a lot of anxiety amongst a lot of students, and it's very, sometimes the way they have handled things aren't, yeah, the best. Like I remember one time actually in, I think it was in, um, the first, second year like they, I think at the end of first year they ranked us all from like, literally from one to, to the last. (Theo)

The risk of attaching self-worth to a system in which people have to place across the range of scores is that it creates divides amongst the student cohort. For example, Violet noted that this could affect the development and maintenance of relationships and shared resources which are describe later (subtheme 4b) as key attributes to successful completion of the course:

I know that the system is sort of designed in a way that it makes ranking important and people are worried about it. But I know people who, you know, had falling out with their mates, or their best friends, because one of them got a distinction on a KT and the other one has half a point less and didn't get a distinction. And then they stopped talking. It's a reality of this medical school. (Violet)

5.3 Theme 3: Academic support lags behind psychological support

All participants utilised formal support systems at some point on the course: some were imposed as a requirement of remaining on the course, and some were actively sought. What became clear from the participants' narratives is the difficulty they had in distinguishing between psychological support and academic support which impacted how they perceived their experiences. One

student support option at BSMS is allocated personal tutors (discussed in subtheme 3f). Another is the student advice team, which consists of non-academic advisors who are available to advise students on a broad range of problems, including personal issues, financial difficulties and health issues, as well as being able to signpost the necessary support services. For students with physical disabilities, long-term mental health or medical conditions, or specific learning disabilities such as dyslexia, there is a dedicated student support unit (SSU) of specialist advisors who provide learning support plans that may include individual support tutors, assistive technology, and reasonable adjustments to teaching and assessment. These services are separate from school-specific academic support services such as allocated teaching fellows and remediation sessions. There appeared to be a belief that the student support unit was predominantly there to offer psychological support rather than academic support, which impacted how they utilised the services, and may explain some of their frustrations about the academic support they received.

5.3.1 Subtheme 3a: The psychological support offered was beneficial

Overall the participants were very grateful and appreciative of the psychological support offered by student support services at BSMS. Key features noted within numerous narratives were the visibility of the services, and the importance of explicitly making students aware early in the course that it was acceptable and expected that the majority of students would use their services at some point. This helped reduce the stigma that is associated with mental health issues and learning difficulties that is a known barrier to access.

I think BSMS has always, like, always told us and always proven to be somewhere where there is a lot of support, if, if and when you need it and like I remember them telling us after first year that I think that 95% of the year had been to student support for one reason or another. (Paul)

Student support was praised for creating a friendly and welcoming atmosphere with regular follow up appointments, the provision of actionable management plans and staff maintaining contact even after the event that led to the participant seeking support. This helped the participants develop trusting relationships in which the staff were perceived to be “on their side”. Student support were seen as external to academic support and academic faculty. This division appeared beneficial in allowing students a space which they felt free to access the support they needed.

Even despite the benefits of great visibility and accessibility it remained a challenge for students to make the first step to access support. Students describe needing “courage to let [their] guard down” (Paul), “being in denial of their issue” (Simon), “feeling like a burden” (Nelly) and the fear

of exposing themselves as barriers to self-presenting to the support services.

5.3.2 Subtheme 3b: External Support has many barriers

One of the roles of student support is to signpost students to formal psychological services and whilst this was beneficial, navigating the system to access support was not always straight forward. BSMS is a part of two universities, the University of Sussex and the University of Brighton. For the most part medical students remain separate from students on other courses and have a teaching campus adjacent to the hospital rather than on the university campus. This created logistical issues for students as many of the formal support services were only accessible through one of the universities rather than the medical school. These included issues with commuting to campuses away from the placements which was particularly challenging during clinical years. This was a crucial reason behind Nelly's decision to stop using the service:

When she reached out to me again in third year, to set up appointments like to begin with, because I wasn't living near campus anymore. And that's where the support was, it was really difficult to organize appointments. And then once that had happened, I just sort of shut off contact because I felt really uncomfortable about reaching out again. And, again, the idea of being a bit of a burden to kind of organize around my schedule and things, like it was university wide rather than medical school. So it wasn't very, like logistically easy to access, if that makes sense. Yeah. And then by the time it had become difficult, I then felt uncomfortable about it. (Nelly)

In addition, the services often lacked flexibility, and required the students to attend fixed weekly time slots. This was difficult given the nature of the medical course, and it could potentially require the student to expose their help-seeking to a much larger cohort of faculty and clinicians to explain their absence:

But it's just, it's hard because they, they don't know, we have Ward round every other day. So we can't just turn up to therapy every week. (Simon)

Whilst BSMS made efforts to reduce the stigma of help-seeking, it was not extinct, and many participants wanted to keep these matters private. This links in with wanting to fit in and belong and not to feel "othered" or to be burdensome. This meant that students could be faced with prioritising their mental health or foregoing the support.

In addition, there was a feeling that the support offered at the university was too generic and lacked an understanding of the specific needs of medical students and the commitments and challenges of the course. This meant these services failed to meet the perceived needs of the participants as Nelly stated:

The sorts of stuff that you're doing as a medical student are very different to what you're doing as another student. So it's kind of difficult to have the sort of particular challenges you have kind of dealt with almost. (Nelly)

There was a prevailing desire for support systems to be held within BSMS student support which specifically aimed at the needs of medical students. One could argue given the high levels of anxiety and stress and high prevalence of mental health difficulties amongst medical students intertwined with the specific commitments and expectations of the course this is not unreasonable for institutions to consider. In addition, it was important to participants that the staff understood their experience as it gave the support legitimacy. The knowledge their experiences were shared amongst other medical students made it less intimidating and more manageable. This sense was lost when having to navigate systems and individuals that they felt did not understand their position which was often cited as the cause of their lack of engagement:

But personally I'd prefer it if it's within the circle, because I feel like it's been, there is a better understanding of the situation. Like the student support team knows everything about the med school, they know how everything works. So they are the best people to, umm, I dunno like, I don't know, I just feel like they're there to sign post for us, which is nice, but I feel like I don't know if it'll be more useful if they were actually also dealing with some of the stuff that umm. Instead of going to university of Brighton, I dunno, I just felt like it was just really awkward for me to get my head around that I have to go to Brighton that we don't really have a relationship with. (Simon)

5.3.3 Subtheme 3c: What can be learnt from student support and how can it translate to academic support?

SSU offers academic support for students with existing conditions that may affect learning and formulate individualised learning support plans. However, there seemed to be confusion over what academic support meant to the participants leading to a misperception of the support provided and how they engaged with it. This may explain in part why the experiences and attitudes towards academic support were described in a predominantly negative manner. Whereas the psychological support was visible and easily accessible, the process of accessing academic support and who was eligible to access it was unclear. That limited participants from self-referring as the fundamental belief was it was only available to those who failed, as described by Theo, who did not feel he would have had legitimacy in accessing support until he failed:

If I was passing, but I didn't feel, err, I didn't feel like, good about my grades or whatever, I want to be honest, I think, just because you wouldn't really have a leg to stand on like. As you're passing assessments. In my head. I just feel like they would probably kind of dismiss you. And not that there's any one particular or the medical as a whole, but I think I just I think, personally, I feel that I wouldn't feel comfortable if I didn't feel like I was progressing in the way I should that I could seek out if that makes sense. (Theo)

This meant that the main pathway that the students were aware of was when they were identified by the medical school having failed an assessment and/or had to re-sit a year. This led to a misperception which situated academic support as an undesirable punitive measure only accessible as a result of poor performance. This impacted the degree of agency and fairness the students perceived of the support on offer and therefore how they engaged with it.

The participants who were able to actively seek out academic support through student support found this process to be unclear and was described as inappropriate. The legitimacy of the support staff was questioned due to not being academic faculty and were perceived to have a limited understanding of the academic aspects of the course:

People like student support are obviously part of the med school, who have been there for, for a while, but aren't medics themselves. And so it maybe, I don't know, maybe there's, there's scope for and not sure how possible this is again, this is a very random suggestion, but having someone who is a medic, or doctor of some sort whose kind of been there and done it on the team or a member of staff there to maybe speak to as well, for maybe specifically academic stuff. (Theo)

Nigel describes this confusion around the role of SSU when he accessed psychological support which led to a diagnosis of a learning disability which impacted how he sat his assessments:

In terms of route, I think (sigh), I have to say that the process felt very separate, it felt like the student support were just sorting everything out on their own. And then it ended up getting me, you know, direct, had an ended up having a direct consequence on how I sit my exams. And it felt like, is that the role of student's support is, or should they, should they, you know, should they need to be that that involved? Or, or are they, is it, are they more there for the kind of, you know, emotional and pastoral side of things. (Nigel)

This meant than when support was accessed through this means it felt that it did not necessarily match the needs as perceived by the student and was viewed as overstepping their remit. Nigel discusses this disconnect when he sought out academic support from SSU who referred him on to the disability service that provided additional time for assessment without the involvement of academic staff:

Because I don't, I don't necessarily think that I've had a time, an exam time issue or a focus thing, you know, I was very much, they said, "Oh, you can have 25%?" And I said, "Well, I'm not gonna, I'm not gonna say no", but, you know, very much in terms of assessment, I've never, never really used it to be fair, I just, it's not necessarily a time and it kind of felt like, that was something that could have been offered, and perhaps from the academic side of things, you know, looking at, looking at my file and going, "Oh, well, he's got the 25% extra time, that's, that's fine." (Nigel)

It is necessary to keep disability assessments separate from academic faculty to ensure reasonable adjustments are in place and unbiased examiner scoring. However, this process and the lack of contact with an academic member of staff contributed to the disconnect between the student and the institution in which the support offered was not perceived as meeting their needs.

5.3.4 Subtheme 3d: Preclinical/clinical divide revisited through formal remediation

The preclinical years are predominantly lecture and small group work-based learning focused on the basic sciences whereas, in the clinical years, learning occurs mainly in the clinical environment focused on applying knowledge to clinical scenarios. There was a clear divide in the descriptions of the support offered to participants who failed during the clinical phase of the course compared to those in the preclinical years. Briefly, this divide reflected the greater importance afforded to the clinical years, which the participants' perceived as a better representation of what was expected in their future job. This raises the question of whether the institute is complicit in reinforcing the students' belief that the preclinical years are less important than the clinical years.

The narratives of those participants who faced academic difficulty in the preclinical years is consistent when describing the lack of academic support offered:

In terms of any academic support that was offered, was from, from the uni was, was none, I'd say. I just wasn't, it was. I mean, I, I, I don't want this to feel like I'm embittered or having a go but the just, when we started the year again, there was there was kind of very good, pastoral support in terms of, just student support, be, being aware and, then the assessment, admin guys being aware and checking in, going, Oh, how's it going? Yes, you guys. Are you, you okay? And, you know, from, from a kind of emotional, psychological point of view, that was fine. But, in terms of actual academic support for it, related to, to the module or anything that was just it was, it wasn't there, it wasn't offered. (Nigel)

Examples included, not being able to view their past exam scripts or if they were able to this was done without the support of academic staff so they did not receive help in identifying areas of weakness or direction to improve and change practice. The lack of options to discuss or explore their needs was considered by participants to not meet "the bare minimum" (Nigel) standard and the support was considered "unfit for purpose" (Nelly). In addition, there were no opportunities for those resitting to have group sessions to help support them.

Conversely, those who failed in the clinical years described a number of positive initiatives that were identified as beneficial: group revision sessions, individualised learning plans, and the assignment of individual academic staff members to provide tailored support. Nelly experienced support in both phases. She alluded to this difference, and emphasised that the support in the clinical phase was more helpful:

I think that the catch-up programs for clinical years are generally a lot better, which again, there was a revision program in third year, which was very good. And very useful. So it's sort of felt like there could have been something like that a bit earlier on perhaps. (Nelly)

These initiatives helped the participants improve their self-regulated learning practices, identify their strengths and weaknesses with direct, timely and actionable feedback:

It was useful to go back and speak to someone about if I'm, if my understanding and things are right, and my reasoning, my thought processes, reasonable and things like that. So I think having that reassurance was, was the most helpful part. (Simon)

5.3.5 Subtheme 3e: Informal support

Participants were very active in the ways in which they accessed informal support and the resources they used, especially during periods of difficulty during the course. Predominately, informal support came in the shape of friends, family and partners who provided emotional and psychological support. The importance of these support networks should not be underestimated, as many participants such as, Nigel, credited them as underpinning his ability to persist on the course:

Certainly the, the times in which my, my confidence has been very, very knocked in relating to poor academic performance, I've always had a strong network around me that has always been able to, to help pick me up and go again. Because and I think it's a, it's a, it's a massive component, as I say, because throughout the medical journey, I've certainly had my fair few share of, of knocks. And, and certainly I don't, I don't think I'd probably be progressing with the course or be at this point. (Nigel)

Theo reiterates that statement when he considered leaving the course:

I think if it wasn't for them. I wouldn't have. I wouldn't have carried on with med school, probably because I was, I think there was a point during my, my third year thinking "oh, I'm not sure this is for me anymore." (Theo)

Whilst often the support was described as loving and caring there was also a space for honest conversations, challenging questions and reflection, described as "tough love" (Paul/Simon). This helped participants consider their own agency in the outcome of their performance rather than externalise the causes of their failure. This is an important but often neglected aspect of student support that helps develop self-regulated practices although how this could be harnessed is unclear.

Theo showed how resourceful participants could be as they actively sought out support from their wider community. In his case he took the opportunity to practice learning skills he was finding challenging with a member of his religious community who was a physician:

I was quite fortunate, but I had, um, there was a, a guy from my church actually who was a, or who is sorry a doctor or a GP. And sort of mentioned stuff. Mentioned I just talked, spoke to him about how I was struggling and he offered to help with my CbD cases and stuff. So I managed to talk through it with him, which was really, really helpful, because he pointed out different stuff that otherwise I wouldn't have, you know mentioned. (Theo)

Informal support networks also helped guide participants to better help-seeking behaviours. They provided the 'push' they needed through acknowledging and legitimising the issues the

participants were faced with. For Simon, that led to the diagnosis of a mental health condition and learning difficulty leading to onward referral to the appropriate services and the formation of a formal learning support plan that he found beneficial:

So I think, was more to do with me speaking to my friends and be like you know I'm over thinking a lot of things. And I'm always, like, umm, struggling to concentrate. And like when I'm revising, I just, my, my thoughts are always all over the place. Like, I can't, I can't concentrate, especially in the lectures and things like that. And that's when I, and then my peers said it shouldn't be that bad. So maybe something's not right. And that's when I decided to seek help about it. (Simon)

However, this experience of informal support was not universal, as not all family or friends understood the specifics and pressures of medical student life. Jem provides an example of how students from non-traditional backgrounds may miss out on what is perceived by other students as a crucial factor in their persistence and success. As the first member in her family to attend higher education there was a gap of understanding between her and her informal support structures.

I think talking to someone, from the med school, about what I have struggled with, in the past has helped, rather than I can talk to my parents and my boyfriend or you know, but they're not. I don't think, they, I don't know. Maybe they don't know how hard it is, or, you know, what are the pressures like, cos none of my family have been to university or anything. I mean, neither has my partner, but someone from the uni who's, you know, knows all about it, and then saying, you know, it's really hard, take a break or chill out. yeah I think that's probably what it's been. (Jem)

This shows the need for institutions to help provide formal support systems that focus on the psychological wellbeing of the students and a space for them to explore their concerns, fears and challenges of the course.

5.3.6 Subtheme 3f: Support is intertwined in the curriculum

One aspect of a longitudinal support system that appeared underutilised was the role of academic tutors. Tutors are expected to arrange three meetings a year with their assigned student in a longitudinal relationship that traverses the entirety of the course. However, it appeared unclear to participants what the purpose of this relationship was. The only clear role that was repeatedly described was to sign off tasks in their logbooks. Whilst there was a variation between the positive and negative experiences described by the participants, there was a universal belief that their tutor was not the appropriate person to go to if they faced psychological or academic problems. The most commonly cited reason for this was that they were clinicians who were already overburdened with work and not easily accessible in a timely fashion as described by Nelly:

I've tried to contact them on a few occasions about sign offs, and it's been very difficult. So the idea of contacting them about other stuff, I think is something, I just wouldn't want to do it, you know, the idea of waiting around for two weeks, and then go, I found this in my junk. Sorry about that. Just sort of feels quite. Yeah, it's not comfortable. (Nelly)

In addition, participants did not feel they were able to develop relationships that would have made them feel comfortable to discuss their issues and were concerned these issues would not have been perceived as legitimate with the potential of being belittled. Paul described his relationship akin to that of a stranger:

I haven't seen my tutor since third year, I had like, two emails when I had to get stuff signed off, like, Yeah, I mean, I, I asked my clinical tutor to be my reference, on, for my F1 process which admittedly makes zero difference unless he was going to say some awful things about me, but err, but I hope he didn't. I was like, I'm basically asking a stranger who knows nothing about me apart from what he sees on the screen about me. (Paul)

Theo explained that although he had a good relationship with his tutor, their meetings were too sporadic for sufficient trust to be built for him to feel able to discuss the difficulties he was facing:

I think your meant to meet them I think during third year once every term, well that's the idea when I was in third year, I'm not sure how it is now. But, umm. yeah, for me personally, it takes more than that, to develop a relationship with someone where you'd be able to feel comfortable talking about. (Theo)

Nelly was more concerned that as qualified doctors, Academic Tutors had more important issues to deal with and her problems would have appeared insignificant:

They're qualified doctors, and maybe they're gonna think I'm just being silly about this whole thing. (Nelly)

The belief that their issues were insignificant, especially to those placed in positions to support them, increased the risk that students would seek help much later: when the issues had either escalated or there was inadequate time for staff to be able to provide the appropriate support.

5.4 Theme 4: The importance of belonging

The fourth theme addressed the importance of belonging to participants' ability to learn, and the various ways in which this manifested. The environment at the medical school both helped and hindered participants to feel welcome and secure. Their sense of belonging was built up through their interactions amongst their peers, the institution and within the clinical environment which was highlighted as particularly challenging to navigate.

5.4.1 Subtheme 4a: A welcoming yet competitive environment

What the medical school was perceived to stand for - its morals and values - was important in

creating an environment in which the participants felt welcome and secure with a sense of belonging. The majority of participants described the medical school's values as aligned to their own, which influenced their perspective of the institute and their engagement with it. These narratives portrayed BSMS as a supportive learning environment that was small and friendly. The perceived ethos of the medical school amongst these participants was that it was "patient centred", "took a holistic approach to medicine" and was "inclusive and diverse". The focus of the course was seen as creating doctors rather than attaining assessment success. These were considered shared values that were important to the participants, and they discussed with pride forming part of the BSMS identity:

I've always really loved the erm, the environment of BSMS. Like I quite. I think there's, massive bonuses to it being quite a small med school ... There's definitely a BSMS identity.
(Paul)

The participants who described socialising as less challenging positioned faculty as predominantly supportive. This led to more active help-seeking behaviours and greater engagement with the support structures and an overall positive reflection of their experience as medical students. Even when confronted with aspects of the course that were challenging or below their expectations, they took a more pragmatic approach with a greater consideration of the difficulties that the medical school had to contend with and that a "perfect" system does not exist:

There's just always going to be things that you do like, and you don't like, and that will always work for some people not work for others and nothing's ever. Nothing's ever perfect. I just, yeah, don't expect everything. People whine about the most pathetic things and you're like, "Oh God, really! When you get out in the real world, how are you going to survive?"
(Katie)

Three of the participants had a much more adversarial relationship with the medical school which shaped how they framed the impact the institute had on their learning and support. The breakdown in the relationship meant that the interface between the participant and the institute was consistently negative. The medical school was perceived as a barrier to them being able to access support, obtain feedback and ultimately succeed. In this way the medical school was seen as an obstacle to overcome rather than a supportive structure. These participants provided a completely contrary description of the overall atmosphere at BSMS in which the medical student populace was perceived as generally unhappy. The curriculum and assessments were viewed cynically as "hoops to jump through" (Violet) created by academic staff focused on progressing their careers rather than to benefit the students. The medical school was described as lacking transparency, "closed to receiving student feedback" (Nelly) and unwilling to change. Nigel described how he lost faith in the institution due to past experiences of student forums in which what he perceived as legitimate queries and suggestions were ignored. This contributed to an

antagonistic relationship between the student body and the faculty:

The response has always been, certainly in years one and two, the response was very much like, mmm yes, we hear what you're saying, but we can't really do anything about that. And that that seemed to be quite a consistent approach and say there wasn't, there wasn't really any resolution to what were certainly quite, quite sensible and legitimate queries, and it just, there was just, there seemed to be an almost, certainly the later ones I went to there always seem to be a kind of, antagonistic environment there if, it felt like, it felt like everyone was a bit frustrated with certain elements of what was going on, and there just wasn't, wasn't necessarily a willingness or there was a bit of a disconnect there. So, so that really, that really formed my opinion, in my view of, of how, of how if I, if I were to go for them, to go to the, the academic phase team, with a query that, it just wouldn't have been taken seriously. (Nigel)

This belief that their concerns were not considered valid and would not be acted upon was reiterated by Violet and impacted her help seeking behaviour:

I thought it makes you feel like your issues are not really valid. Or like, your problems are not really valid ... So yeah, it made me feel like that's just swept under the carpet ... I think at the back of my head, I, I've had this feeling that they wouldn't do anything, because when I reported something serious, nothing was done about it. (Violet)

This conflictual relationship framed the way in which the support that was offered was received.

The medical school was described as acting in direct contrast to the values they espouse and promote, and this further alienated the participants, as Nigel describes of his experience when he attempted to access academic support:

It just felt. I don't know, I just thought was like, Well, I feel like I'm not being, you know, you want me to pass, I want to pass. But that doesn't feel that I'm being helped in any way here ... And it just felt, I'm being told, you know, we're here to support you, we're here to help you. But the actions seem to be the complete opposite of what the narrative that was being pushed. (Nigel)

Jem similarly described this sensation when she needed support with her substance abuse issues in which she had an issue with alcohol and was drinking to excess that was deemed to necessitate formal support. Her belief that she would have been able to tackle these issues without taking time off the course appeared to highlight a lack of insight on her part:

And it's like, you know, it's supposed to be Brighton (exasperated sigh). Supposed to be you know, pro mental health and things. I didn't feel that was the case at the time. (Jem)

This oppositional positioning was also a barrier to these participants' ability to accept and learn from any negative feedback they received during the course. The adversarial framing meant that the feedback was considered unsubstantiated and unfair, leading to its subsequent rejection. For example, Violet, received negative feedback on an OSCE station she believed was factually incorrect. This made her feel "horrible" and "destroyed" her, resulting in a total refusal to engage with future feedback:

It's quite easy to say "oh yeah, you know, it doesn't really bother me, whatever". But obviously, it does affect you, if somebody says that you are hopeless. But especially if you

find things that are definitely not true, like, you know, the thing I mentioned that somebody said, I said something, and I obviously couldn't have said that, because I didn't even know what the word meant ... The feedback just destroyed me. I felt horrible and yeah, and I found a lot of things that were like, where did this come from? Like, clearly I couldn't have said that. And then, so I basically decided, after the third year OSCE not to read the feedback. (Violet)

5.4.2 Subtheme 4b: Socialising with peers – a complex terrain

The need to “fit in” was considered very important and the participants described numerous ways in which they took an active role in developing and building relationships to create opportunities to learn with and support each other. Participants who found socialising particularly challenging noted that random group allocations introduced by the medical school in clinical years were particularly helpful in supporting the development of social relationships. These relationships led to a multitude of benefits including shared revision resources and developing and disseminating information about how best to navigate and optimise clinical placements. Participants also formed study groups with their peers with a particular focus on practising and developing their clinical examination and history taking skills. Relationships with peers in senior cohorts were cited as beneficial to their learning, helping them obtain the “tips and tricks” of the system. Some participants were also able to develop new learning practices from their peers which helped them achieve their academic goals. Nigel describes how reaching out to his peers helped him adapt his inefficient learning practices:

When I went out the first time, I think I, as I said, it was just, it was a lot of, a lot of detail. And I just tried to say, try and rote learn it and try and absorb as much as I could. And then the second time, when I knew I was coming round, round to it, in the, in the repeat, year. I, I just reached out because I knew a lot my friends have passed it. And, and it was at that time I reached out and I said, you know, “what, what am I doing wrong? What can I do?” ... So I've got my friends, like they had like summary sheets, which I was able to look at, and I went; Oh, okay, this is probably a better way, a better way of doing it and making, making short, snappy summaries as opposed to just trying to learn lots and lots of big, big facts. (Nigel)

Simply being surrounded by friends with a strong work ethic who were high-achieving helped motivate participants such as Katie:

And I've got, you know, I've got a good group of friends around me that are, you know, they really enjoy it, too. They're really into it, they want to work hard. And I think that really helps as well, having people that are like quite like minded around you, like I don't have lazy friends and they sort of, maybe, probably I'm the lazy one and they sort of like, pick me up and motivate me more to be able to do more. (Katie)

Beyond the academic benefits, close peers were also a source of psychological and emotional support during the course. Paul described that following his experience of failure he found it easiest to speak to other people who had experienced failure:

I think to my housemates [it] was a bit easier, because I think one or two of them had failed as well (slight laughter). There's always like solidarity. (Paul)

However, socialising at medical school was complex. The “typical medical student” profile was depicted by participants in this study as a privileged, undergraduate who was academically high achieving at school, and that this was not how many of the interviewees saw themselves. This is illustrated in the following quote:

You've got loads of kids that had been private educated and come from those like typical, like middle class white backgrounds. (Katie)

Participants described themselves as “atypical” if they did not match up with these features displaying a sense of “otherness”. Violet recounts an episode when a fellow student made her feel like she did not belong:

She, for example, said something like, well, if your parents can't afford it, and why are you here? She said that in an open forum in the fourth year of med school. (exasperated sigh) So, you know, and I can see, I mean, I mean, I know a lot of people who think the same. (Violet)

Medical school was described as “cliquey”, a “popularity contest” in which students formed their friendship groups early, often within their first year in halls:

I feel like sometimes it's a bit of a, you know, a popularity contest, isn't it? And people. You know, as time goes on, and everyone's, everyone sort of forms in their own, I just think from an outsider's perspective sort of watching it. Everyone kind of form their own little cliques. (Katie)

At university there are often halls of residence that housed the majority of the medical student cohort. Participants who did not experience these halls for various reasons felt disadvantaged by this. The ability for participants to find, formulate and maintain their own groups/cliques was influential to their adjustment to the environment. Jem attributes the lack of experience in these halls as a key attribute to her difficulty socialising in the preclinical years:

In my, first year, I went into halls. Um but I wasn't with any other medics. And, as you know, the medic community is a, are a close knit bunch. So I think, that put me at a disadvantage right from the go. I didn't know anyone else. I did make some friends with some girls in the next flat. But it seemed as though everybody else had at least one medic. (Jem)

Some participants found socialising particularly difficult, citing barriers such as the age gap between the mature students and their peers, and reduced time available due to the necessity to obtain paid work. Violet described this division akin to living in a parallel universe to her peers:

I'm, you know, I'm a geriatric medical student. So most of my, most of the people in my firm, are kids, basically, age wise. Umm. So, I can understand how we live in, you know, parallel universes, and we don't really have many things in common. (Violet)

Jem explained that her “icy” personality meant that she did not always “gel with people straight away”. Others explained how the impact of underlying mental health issues affected their ability to develop and maintain relationships:

I find it difficult because my anxiety, I've also got social anxiety. So, for me, like, I'm very, it's very difficult for me to have small talk. (Simon)

Even for those who found socialising easy, the medical school environment was considered insular and separate from the rest of the university. Paul described this as living in a “medic bubble”.

Theo had a similar experience describing the sensation of being “boxed in” in a “suffocating environment”:

When I started my first year, just a lot of medics which again, is understandable, you've got the same timetables, but I think you again, it's quite hard but you lose out on the experience of being with, um, students that aren't maybe, aren't medical students and that sort of thing. You can feel quite maybe boxed in and because it's I think the med schools obviously a separate kind of, kind of a separate university in itself. (Theo)

There was a pressure to socialise and conform which impacted participants time for study and was an additional financial burden, as described by Nelly:

You're sort of having to, you know, feeling obligated to go and do that social side of university that then, you know, makes you exhausted for everything else ... You feel pressured to sort of spend the money and stuff like that, which I think is perhaps a bit of an issue sometimes. (Nelly)

This was another source of ‘othering’ as participants who had to work to maintain themselves through the course. They were made aware of the discrepancy between their financial position and their peers, as described by Violet above.

5.4.3 Subtheme 4c: Protecting their sense of self

There was a sense of fear of exposing “weakness” or in appearing “burdensome” within the competitive environment at medical school. This was described as a barrier to taking full advantage of learning amongst their peers despite acknowledging the missed opportunities. This stopped Nelly from asking for help from her friends:

The group would have been quite a good resource for me to be like, ‘Oh, do you mind going over that topic with me?’ I wasn't going to do that. Because I felt like I'd be a bit of a burden. (Nelly)

Nigel felt “vulnerable” and described how he withdrew from peer learning to protect himself:

When I was revising, I didn't necessarily, I felt, felt quite vulnerable, I would say, in terms of not wanting to come across as not knowing anything, so therefore, I didn't want to revise with anyone else, or bounce ideas off of anyone else, I'd happily just go sit in the library for hours at a time, on my own, and certainly not absorb as much information. (Nigel)

Similarly, Nelly reflected on, and was frustrated with, how her desire not to ‘draw attention’ to her academic needs further isolated her from her friends.

Reassuringly, these participants were able to overcome their tendency to learn in isolation, and

their positive experiences helped them persist with the new learning strategies. Nigel described how “bringing a social element” to his revision increased his confidence by highlighting areas of strength and knowledge which he was able to impart, boosting his sense of self and belonging:

Being comfortable in knowing what you don't know. And being okay. Well, okay. You don't know that. Someone else knows that. But then they can teach me a little bit about that, but then they won't know something about another topic, which I do, so I can then teach them about that. (Nigel)

Involvement in peer teaching helped provide Nelly with a new perspective on help-seeking allowing her to understand that her framing of it as a burden was a self-created fallacy:

We've been doing like our AMECS (Association for Medical Education and Clinical Skills) program and helping the year below and things like that. And I've kind of seen the benefit of it from the other side. Now I'm a little bit more prepared to offer advice to other people that and perhaps I'm like, Well, people quite like offering advice to other people too. So, you know, being put in that position isn't a burden. It's just actually quite nice to feel as though you know things and people think that you know things almost. Um. And also they can always say no. So, I think I'm a little bit more kind of, um, accepting, and allowing people to make that judgment themselves whether I'm a burden or not, rather than me sort of impose it on them. (Nelly)

5.4.4 Subtheme 4d: Developing relationships with clinical staff and integrating within teams

The transition to learning in the clinical environment is a known challenge for medical students and some participants in this study found it harder to acclimatise than others. Those who adapted more readily attributed this to prior experiences of working in the clinical environment as health care workers. They relished the opportunity to take an active role in their learning, utilised experiential learning techniques in which they combined theoretical knowledge with practical experience, and were motivated by an improved perceived curriculum alignment with their future job role; “a small taste of what it will be like” (Paul). In contrast, difficulties with self-directed learning and lack of structure were key components of the accounts of those who found the transition more difficult.

The central component of all the participants’ experience centred around their ability to build working relationships and to construct their sense of belonging in the clinical environment. Participants placed themselves as ‘outsiders’, looking in as they struggled to integrate within the clinical teams. They gave numerous descriptions of being perceived negatively, as offering little in the way of positive contributions, driven by learning agendas that did not align with the needs of the clinical staff leading to them being considered to be a burden:

Sometimes quite a lot of the attitudes which you get from turning up as a student, and, you know, just being that sort of in the way and whether or not, it's, it's attitudes from, from senior colleagues or, you know, juniors who think you're just in the way or stepping on their toes, if you want to help out or write in the notes, or from nursing staff or things like that, who just don't want you there, you know, that's, that, that's challenging. (Nigel)

The lack of acknowledgement of being a part of the team by clinical staff had an impact in the development of their professional identity. There was a shared belief that they needed to go above and beyond to prove themselves as useful, attentive and valuable, to gain positive experiences. The participants were vocal about the need to remain resilient in the face of rejection in an environment that was not welcoming:

I think sometimes you just got to learn how to bounce back from rejection, haven't you and find, find someone else and be like, okay, right. It's probably not me, it's probably something going on with them. We'll see. We'll see if we can figure it out somewhere else. (Katie)

The negative reception and interactions made the environment feel intimidating and whilst they were often able to rationalise their position within the learning environment (i.e. not a priority) they felt neglected as described by Jem and Simon:

I've been on ward rounds, they just don't even look at you, the entire time, is quite, intimidating. Makes you not want to go back. (Jem)

However, some interviewees were able to understand some of the reasons for this. For example, Simon noted a hierarchy of responsibilities in which patient care came before student training:

I felt neglected by the doctors. And as I said, it's not, it's not, I don't blame them for anything, because at the end of the day, they're there to treat patients, that's the priority. (Simon)

One heavily-cited barrier was the need to obtain sign offs for their logbooks. The logbook carries the benefit of providing a comprehensive structure to ensure a standardised student experience aimed at supporting students to achieve their competencies during clinical attachments.

However, there are a number of negative consequences of this practice, including the effect on the clinician-student relationship. Obtaining the signature was described as an additional task for over-worked clinical staff members, leading to the development of negative interactions with the students who felt that they had to "chase a signature". This was particularly challenging for participants who described themselves as shy or introverted:

Often it's a lot of, I guess, kind of like hassling doctor's, oh can you sign this off for me, and them saying; I'm busy right now, later, later and that's like that's what happens loads of times, like 'what am I meant to do?' So I think, I think I had a shock of that aspect of things like having to be a bit more forward and a bit more. Because I tend to be a bit more introverted and not really want to hassle people, for things. But you have to be a bit more assertive, I guess and that was something I wasn't really used to. (Theo)

Within this narrative the participants saw themselves as subservient to the clinical staff, placed amongst the lowest rungs of the hierarchy in the clinical setting. For example, Simon said:

I try my best to not get in anyone's way (Simon)

The lack of integration into the team in combination with a lack of an explicit role or accountability to the team appears to be problematic. Katie compared how her experience was a complete contrast to that of her friends on the nursing course:

I'm friends with a lot of nurses. And we sort of compare and contrast, like, your experience of being a student, I feel as a nurse, you are integrated into a team, you are part, people expect you to be there. You're like, held accountable for things. (Katie)

Participants prioritised “sign-offs” to avoid a punitive response from the institution resulting in missed learning opportunities. This was frustrating for students and was felt to reinforce the belief of the clinical staff that there was no genuine desire to learn:

“Oh, god, what, what do you want signed”, or someone will just go, “I'll just sign it and you can go” and I'm like, “actually I would kind of like to be involved in something or you know, I'd like to be taught something”... There might be something else really good going on. But you'll have to do this session because this one I need the signature for. (Katie)

The above experiences meant that the logbook was primarily seen as tick box exercise of “meaningless signatures” (Violet) that acted as a barrier to their integration into the clinical teams. It was also perceived as evidence of the medical school’s lack of trust of the students’ ability to direct their own learning.

The participants were aware of the importance of developing relationships with the clinical staff to cultivate the best learning opportunities. Another barrier to this was the lack of continuity on placements. Nigel describes clinical placements as ‘transient’ in nature that limited his learning opportunities and did not allow him to develop trusting relationships to optimise his learning opportunities:

It's just very transient, you. You just kind of you flit in and out and you maybe get a sign off, or you maybe don't, and yeah, it just, just, just makes such a difference. If you've been somewhere for a number of days ... The times in which I've gotten the most, and I've learned the most and retained the most is when, if you've been on, if I've been on a ward consistently for a week or two weeks at a time, then you get to know the team and you get to, you get kind of a bit trusted, you can do more, and then by doing more, you're you know, you then learn more. (Nigel)

The medical school understandably wants to provide students with a wide range of experiences to ensure they garner adequate exposure to the multitude of specialties within medicine.

Participants warn that the effect of the transient nature of their placements as they are shifted from ward to ward, clinic to clinic hinders their learning as they try to establish themselves:

Week to week, you're on a different ward, you're in a different clinic, like you just, there's no continuity, no one knows your face. No one knows. No one's expecting you to turn up. And you're constantly yeah, justifying who you are, your reasons for being there, I feel like you always start on the back foot and you're trying to get something out of someone without inconveniencing them too much. (Katie)

One recurrent protective factor that helped the participants feel secure within the clinical environment was the impact of positive feedback from clinical staff and patients. This help provide validation of their ability to perform the role of a doctor which increased their motivation and enjoyment:

I feel like now I've got into clinical years and things like I'm not a complete idiot. And I can answer questions that people ask me and, you know, I do seem to be alright with patient interactions. And I just feel like, all of that sort of positive reinforcement has sort of motivated me more and more and more. (Katie)

Nigel reiterated the positive motivational impact of positive feedback and reflected on how it has changed the aspect of being a doctor he now values:

I have had good, good feedback. You know, specifically this year, I've had, I've had three emails, one from a patient, one from a pharmacist, one from one of the paed surgeons just basically saying how they were pleased, you know, they were impressed with me being in clinical or whatever, and how engaged I was and how good I was with the patients. So, so I think that's my motivation now is not necessarily helping, being able to help through being a super duper academic, but just knowing that it's an environment in which I can thrive in. (Nigel)

5.5 Meta theme: Duality and contradiction

Across the four themes outlined above was the meta-theme of duality, which I discuss in more detail below. Oftentimes this duality was of a contradictory nature in which participants found it challenging to articulate the ideal outcome they desired.

5.5.1 Subtheme 5a: The duality of failure

When discussing failure, the duality centred around the opposing nature of their feelings towards the experiences. On one hand there was the “embarrassment” (Nelly) and associated feelings of “worthlessness” (Theo) combined with the fear and anxiety of “getting kicked out” (Theo) that made the participants question whether they were deserving of a place on the course (Nelly). On the other hand, the “shock” (Paul) of failure was often the catalyst for change, the event that caused the participants to reflect on their situation, the practical realities of failure, and the potential to be removed from the course. In such cases, it was a prompt to “turn something that’s inherently quite negative into like, a positive” (Paul). These powerful moments led to reflections on their motivation to be doctors, their ability to succeed, their attitude towards learning and the learning practices they employed. This led to behaviour changes including “reaching out” (Nigel) to friends and peers to develop more effective learning practices and improve their help-seeking

behaviour. Conversely, those who did not fail but remained on the lower spectrum of academic performance never had a moment that centred their reflections to prompt more in depth reflections that allowed for significant behaviour change. This meant the cycle of inefficient learning practices continued, as it enabled them to remain on the course, despite it not being optimal, and despite their awareness of this:

I am very much a procrastinator. I'm very aware that it's a problem ... My problem is that I am like a higher functioning procrastinator. So I leave everything to the last minute. And I'll still do well in it. But I've annoyed myself because I know that I could have done better. And that's what like perpetuates the problem, because I know that I can get through it. But it just really annoys me in the interim that I still, every time I do it, because I still won't fail anything. (Katie)

5.5.2 Subtheme 5b: The duality of assessment, feedback and support

When discussing their support seeking behaviours there was a clear divide between their experiences with, and attitudes towards, academic and psychological support. In general, psychological support was described positively as; approachable, accessible, normalised with regular ongoing contact which created a safe and caring environment. In contrast, participants found academic support difficult to access and of a varied level depending on whether the support was necessary during their preclinical or clinical phase. Overall the findings in this study re-iterates those from the literature that academic support is perceived as “too little, too late”^{173,174,260} leaving the participants feeling neglected by the institution they believe is placed primarily to support them.

Nelly raised the potential of using formative assessments to help the early identification of students in need of support:

It would be good to have something more sort of, um sort of regimented, where something that's like you do a sort of short exam or something. And if you are below a certain percentage that you get a bit flagged and oh hang on a second. Is there something happened here? (Nelly)

Theo found it hard to decide his preference when reflecting on the benefits and drawbacks of an increased amount of assessments. A greater frequency of assessment may have the potential to dilute the importance attributed to an individual one, which may improve their ability to perform, but as the students have described above, the assessment periods are perceived as the moments of greatest stress and anxiety:

I think having multiple assessments takes pressure off one, having, to perform once on the day, because like, if you mess upon that day, then that's it. But at the same time, again having all those assessments that count is very stressful, like you having to like, study for, like multiple things throughout the year. (Theo)

Formative assessments were deemed less stressful by participants and there is evidence that regular formative assessments improves final summative performance especially in students within the lower spectrum of scores.³⁸⁴ However, participants in the study were very honest that they focus much more of their energy and time on the summative assessments as they are “what count”:

I think generally my approach is, is if it doesn't count then I'm not gonna put too much effort into it. If I'm honest. If it counts that I will. (Theo)

Paul goes further and warns that the approach he and fellow students took to formatives was detrimental to his learning as it installed bad habits in his first year at medical school in which there were no summative assessments:

It doesn't count. So to be honest, like to me, passing by, like a good 20% or scraping through had very little umm, little difference, but that I think installed at times, quite bad habits, probably where my, where I didn't know how to revise because, because I've never taken revision that seriously erm. So, (cough) I do think, like, yeah, back then it was probably a bit more detrimental. (Paul)

This was re-iterated by other participants and highlights the need for a mixture of formative and summative assessments. Participants did cite the benefits of formatives as helping them gauge their level of knowledge and in doing so identified areas of weakness to direct their studies. Positive feedback from formative assessments boosted their confidence and improved their motivation:

I take them more seriously now than I used to before only because, it's I know that it's, it's great to make me feel better about myself if I do well in those. (Simon)

For some, the perceived benefits of formative assessments became apparent over time. Paul described how his approach to formative assessment changed as his motivation to study became focused on being prepared for his future role as a doctor:

My mentality was very different. I was like, well, this is finals level. I'm not going to do, Paeds, Obs and Gynae next year and fifth year, I was very much I don't want to be going in as an F1. Having not taken Obs, Gynae, Paeds, not taking that stuff seriously, and then be stuck in a situation where I'm expected to provide care for someone in this situation. (Paul)

When similar tools were utilised - for example, clinical placement log-books designed to structure experiences - they were often deemed too controlling. “Chasing a signature” (Katie) to confirm the completion of a task was considered a “burdensome” (Nelly) tick-box exercise which restricted their learning opportunities and acted as a barrier to integrating into the clinical environment.

5.5.3 Subtheme 5c: Conflicting desires of structure and independence

Linked to the ambivalence about assessments was the conflicting desires with regard to the independence students were permitted during their clinical rotations. On the one hand, students wanted more independence to decide on the clinical learning opportunities they wished to pursue. On the other hand, they complained that clinical rotations were too unstructured and that this contributed to a challenging learning environment that they felt unprepared for. For example, Theo described struggling with the freedom afforded in clinical years and the expectation of self-directed learning:

I think with clinical medicine, there's a lot of stuff that is assumed, the curriculum is a little bit more lax. Like, to a certain, there's a curriculum there, and they do give lectures still in clinical years. But it's, again, a lot more stuff that you have to sort of teach yourself and you're expected to like ... I think, I think to be honest actually they obviously, like I said they give a lecture and things like that. But a lot of it's having to find your own resources to learn from. (Theo)

Notably, the enforced changes due to the COVID pandemic that led to more tightly controlled placements was positively regarded. Nelly described how despite less allocated time on the ward the smaller groups allowed for her to feel less intimidated asking questions and improved the alignment with the logbook sign-offs as they became integrated into the sessions:

This year has been a lot more enjoyable because we've had less placements, but there's often only one or two of us. So it's a lot more kind of, one to one teaching and things like that. And you're not feeling like it's sort of embarrassing to ask a question, because you're just the only one there and you have the time to be able to do that and be like, Oh, "well why did you do that with that patient?" Or "why are you prescribing this?" Or, again, with sign offs having them actually sort of be there one to one, you can then go, "Oh, can you help me with this prescribing thing", rather than sort of having to inconvenience your colleague almost sort of go with you mind, like going get that done, or I've got to get an abdo sign off done. (Nelly)

Simon found that the expectations of both the student and clinician became more explicit which helped improve his sense of belonging in that environment:

Because everything's allocated for us, we only need to turn up where, like we're expected to turn up, they know we're coming. We know we need to be there. And that's really helpful. Because they're prepared to take us on. And that's been the case for a lot of clinics and the ward base sessions, I think. Because I, I know I'm not getting in anyone's way because we both know that we're supposed to be, I'm, I'm supposed to be taught and yeah, so, I think that's the main reason why I'm a bit more comfortable. Knowing I'm not getting in anyone's way. (Simon)

5.5.4 Subtheme 5d: The necessity to belong: a double-edged sword

An additional duality that became evident was the impact socialising had on academic performance. Within many narratives, there were examples of the necessity for socialised

learning. Developing relationships was key for medical students to support their learning amongst their peers and within the clinical environment. They described benefits amongst their peers, including psychological support, acquiring and developing new study practices, sharing learning resources, and learning how to navigate the system and hospital placements. Within the clinical environment, the development of relationships increased their perceived acceptance and legitimacy, and helped them to develop their professional identity and gain first-hand experience of their future role as doctors. However, socialising within these environments was challenging. Whilst BSMS was described as friendly and maybe less competitive than other medical schools, there remains an environment where competition is evident and can be detrimental to learning.

The nature of BSMS meant that the participants felt isolated from students from other courses and this created an insular, stifling and claustrophobic environment, within which was a pressure to attend social gathering and “fit in” to gain the benefits of socialised learning. The implicit expectation to participate in the medic social life had an impact on how students divided their time and for some this became a distraction from their studies. Fitting in and belonging is particularly challenging for students from non-traditional backgrounds. The most prevalent of the external barriers to fitting in was the financial constraints that impacted the available time for study and time to develop social relationships. Linked to this was the sense that needing to work, coming from a lower socio-economic status group was considered abnormal and not a shared experience between medical students on the whole which further degraded their sense of belonging.

5.6 Reflections upon the interview process

All participants cited altruistic reasons for volunteering for the study without expecting personal gain. There was a belief that through exploring their experiences, lessons could be learnt that could help future cohorts to avoid similar difficulties.

Jem felt that her negative experiences - which she believed the medical school did not handle well- could be avoided so that future students in her position would have better support:

I don't think, like, on that occasion, I necessarily had the best experience. And I wanted to contribute to making it better for somebody else. (Jem)

Simon also wanted to contribute to change, part of which involved highlighting aspects of his experience that had a positive effect on his learning and helped him to overcome his difficulties:

It'd be nice to see things be changed, some things that were good, that's not been done enough, should be done...I was hoping they'd (the changes) be based on things that you've got from me and other students, like things get put in place for future year groups. (Simon)

Some of the topics discussed in the study were difficult for the participants and evoked negative memories and emotions. It was important that a "safe environment" was created in which they "felt able to voice [their] opinions" (Nigel) and that a careful and considerate approach was taken when addressing these topics:

If you're asking people these kinds of questions, it's better to be, you know, nice and, like, approachable. (Jem)

Although the study was not intended to provide personal enhancement or benefit for the participants, many reported that they found the process of being interviewed beneficial. Theo was grateful for being provided with the "space" to talk through the difficulties he continued to face. He found how the questions were asked, and the prompts helped him reflect on his experiences:

It's been quite helpful, I guess, just to have the space just to talk about this, this sort of stuff...yeah it's been quite helpful with your responses and how you asked the questions, as well. (Theo)

Katie described the process of being asked questions that pushed her to reflect on her experiences as "therapeutic":

I found it quite therapeutic as well, just being able to chat about things...I have learnt over the years that sometimes it's good to talk about things. (Katie)

Paul also commented on the benefits of reflecting on his experiences to better understand why they had happened and how he could change. He raised the possibility of integrating this type of reflection into the existing longitudinal relationship that exists between students and their clinical academic tutors:

I think almost what I'd say is give people opportunities to reflect and almost like, I - what I think, the best way yet again, maybe I'm speaking for me, but would be sort of like a one on one with someone very, like open guided questions, to try and get the answer out... to sit down with an academic tutor and just be like, 'Well, why do you think like that? You felt this or this?' And I do think you prepared in the best way possible. Yeah. I don't know, I think that sort of dialogue, trying to get the student to, like, really think about what's happened and, like, try and get them to analyse the makeup of that. (Paul)

Katie also spoke positively about these kinds of sessions. Although she had a good relationship with her academic tutor, she reflected that the lack of planning and consideration of the purpose and topics that were to be discussed limited the benefits she had obtained from the meetings:

If you knew what some of the questions were going to be before you joined the session, because I think sometimes when you're like, put on the spot, you're like "oh, bloody hell, I haven't really thought about this". So yeah, I suppose like, even yesterday, when I had my meeting with my academic tutor, or my clinical tutor, and he was asking me a few questions,

and I was like, if I had put a bit more thought into this, or knew you're gonna say this beforehand, I could have maybe, like, written a couple of things down, like a couple of pointers and talked about that. (Katie)

Having completed a degree in medicine, my role as a doctor was perceived to provide the necessary legitimacy as the interviewer, as an individual whose experiences “were equivalent or reflected” (Paul) of the participants. Equally important was my perceived lack of “relative” seniority in the hierarchy of the medical school, which allowed participants to feel greater freedom when discussing negative aspects of their experience:

If you were a member of the faculty or something like that, I would have been way more diplomatic and closed with, with certainly my feelings towards feedback from, from exams and things like, because I just, you know, I think it's, it's inherent to, to their structure. And so, you know, you questioning the structure then throws everything into disarray, I think in their mind. So yes, no, I would have been definitely way more, as I said, diplomatic with my responses (Nigel)

5.7 Discussion

This study strengthens several findings from the literature regarding academic performance and attrition, but it contradicts others and also brings to light a number of new topics of interest, especially within the medical landscape. What becomes apparent from any research attempting to understand the causes of academic performance is that each individual is unique, with distinct life stories that influence how they attribute the cause of their academic difficulties, how they are experienced and how this affects future behaviours. Viewing student perceptions of failure through their own words allows us to consider how students create their narratives and position themselves within their stories. This can develop how we offer tailored support that addresses these perceptions, which influence help-seeking behaviour. As Ajjawi et al. (2021, p.10) stated, a student might know support systems exist but will only engage with them if they are perceived as beneficial, ‘as an action that makes sense’.³⁸⁵ Below, I highlight the benefits of understanding the nuances of failure: through understanding the experiences of our students, there may be ways of harnessing its positive potential. The study indicates that more can be done to develop peer and faculty mentorship to improve the available support and the culture and environment within medical schools.

5.7.1 Failure is more nuanced than previously described

The finding that academic difficulties and failure had significant and long-lasting detrimental

effects that led students to question their sense of self and identity as academic high-achievers reiterates the findings from previous qualitative studies of medical students' academic difficulties.^{173,274} The students appeared not to have the tools to manage the experience, and they tended to externalise the experience, hoping that it was a singular event that would not repeat. However, what has not previously been described is that the impact of failure is dependent on the importance that assessment is given by the students and is determined by whether the assessment was considered reflective of their future professional role. Higher education literature shows good evidence that student persistence and motivation are linked to clear goal setting. For example, Ajjawi et al. highlighted how having clear, strong vocational goals had a protective effect that enabled students to overcome academic difficulty.³⁸⁵ Medicine can take advantage of its vocational nature but needs to make sure there is clear alignment between the curriculum, assessments, and future career roles to optimise student engagement.¹¹⁶

The tendency for students to reflect on and learn from their experiences was also affected by the number of failures experienced. Those who did not experience failure in summative assessments were unlikely to change their approach to learning despite being aware of their inefficient learning practices. This supports prior findings of the potential benefits of failure as a positive learning experience.³⁸⁶ Failure in high-stakes summative assessments is not desirable, but if it occurs, medical institutes should take advantage of these moments when students are most ready to reflect, learn and change their behaviours. More importantly, it reiterates the need for more robust ways of identifying those students who remain unidentified by the medical school, having consistently passed their summative assessments to progress on the course. In the data presented here, such students did not necessarily consider themselves to be struggling academically either, and they did not, therefore, have a strong incentive to change their approach. This finding strengthens the need to explore ways to answer a challenging issue in remediation literature: how do we support learners who face academic difficulty before they fail?^{21,133}

Regular formative assessment may help institutions identify and monitor students' performance, and when accompanied by individualised, actionable feedback can help students to identify their strengths and weaknesses.^{274,317} However, I would caution that the impact of failure in formative assessments does not mirror failure in summative assessments. This limits the extent to which students reflect on their performance in formative assessments and the degree of behaviour change that can be expected.

5.7.2 Peer-mentorship opportunities – the potential to create a more equitable experience

Self-identification or self-referral as a pathway to access academic support is known to be underutilised,²³⁰ and this study elucidates some of the reasons behind this. This includes the difficulty that academically struggling students have with self-assessing.^{174,247,248} Other significant barriers were the student's belief that they did not have a legitimate reason to access support until they failed a significant assessment: alongside the associated stigma of being perceived as weak.²⁷⁴ One of the ways in which they overcame this was through informal support networks, be it family members, friends, or peers, who not only encouraged healthier help-seeking behaviours but validated the legitimacy of their difficulties. Medical schools should acknowledge and encourage students' use of informal support networks. However, they should be aware that these support networks are not equal or as available. They should also acknowledge that students from non-traditional backgrounds (e.g., first-generation scholars) may lack informal support networks who have experience of the demands of medical school.³⁸⁷ The lack of availability of these support networks can contribute to the student's sense of isolation during periods of high stress or academic difficulty. Medical institutions should consider ways of ameliorating the impact of this inequitable experience, for example, by taking advantage of students' preferences to seek support from their peers.²⁷⁴ Learning from the positive findings from the use of 'buddy systems', which have been implemented to help International medical graduates (IMGs) transition to practising in the NHS through the support of an allocated peer who has shared a similar experience.^{388,389} The system aims to help IMGs understand the working culture, navigate medical training programmes and address language barriers and cultural differences.^{388,389} Developing peer mentor schemes with a particular focus on students who have come through widening participation initiatives may create a support network of fellow students with shared experiences. These networks may be able to advise future cohorts in navigating the system: for example, the financial support system highlighted in this study which is particularly challenging for graduate students. Near-peer teaching involves senior students teaching and mentoring more junior colleagues,³²⁵ and offers many benefits to traditional faculty teaching.^{325,390} As near-peers have had similar, recent experiences and understand the level of the learners' current knowledge, they may better understand the problems and challenges that students face and, consequentially, are better placed to explain challenging concepts and offer support.³²⁵ Future research should be pursued on whether this congruent proximity translates to near-peer support.

5.7.3 Learning from qualitative interviewing to improve faculty mentoring/supervision

Evidence shows that student-institutional partnerships help optimise self-efficacy, belonging, emotional regulation and well-being.³⁹¹ Academic mentors who work with students based on their needs can activate resilience strategies, de-stigmatise academic failure, and improve help-seeking.³⁹² This study highlighted a missed opportunity for faculty mentoring and support that could be obtained from the existing longitudinal academic tutor programme. Interestingly, although this study did not aim to support the participants, they noted that the interview process was beneficial. The interviews appeared to create an opportunity for participants to discuss, reflect on, and explore their academic experiences more openly. This may be a useful way to help students to understand and change their behaviour. Patel et al. have previously proposed integrating IPA interview techniques into remediation practice to help medical students who had faced failure reflect and evoke meaning-making from their experiences to enable the development of individualised learning plans.¹⁷⁴ This section explores the differences between the opposing experiences described by the participants of their meetings with the academic tutors and the research interviews to determine whether there are potential transferable learning opportunities.

Mentoring has been purported to offer a multitude of benefits for mentees, including providing moral and emotional support,³⁹³ guiding self-reflection and goal-setting, helping to build their professional abilities³⁹⁴ and providing them with protection within their academic institutions.^{394,395} Mentors who are senior and well-respected are important for the knowledge and experience they bring,³⁹⁶⁻³⁹⁸ but this study shows how the power dynamics between mentor and mentee at medical school can act as a barrier to effective supervision. Some participants cited this in combination with the lack of time to develop a relationship that would allow them to open up and discuss their problems as primary barriers. I would argue that this is more of a perception than reality, given that both of these barriers were present in this study, given my role as an employee of the medical school involved in remediation and assessment and the lack of a prior relationship with all but one of the participants. Yet the participants felt secure disclosing the issues they kept separate from their tutors. The participants cited the creation of a 'safe environment' and the open and non-judgmental approach as the reasons they felt able to disclose their opinions. Personal characteristics such as honesty, trustworthiness, understanding, being an active listener and being non-judgmental have been described in the literature as important in overcoming barriers when discussing difficult topics.^{396,397} Creating this safe space appears important, but it was not the sole determinant of whether participants felt able to discuss their difficulties: many of the participants described positive relationships with their tutors but still felt

unable to discuss their difficulties with them.

The participants' experiences with their clinical academic tutors ranged from excellent and friendly relationships to almost non-existent ones. For any mentorship programme to be successful, there is a need to ensure institutions recruit tutors with a desire and dedication to the process of developing an important relationship with their students.³⁹⁸ The tutors require sufficient, allocated time to fulfil these duties, which is a challenge for educators who share clinical responsibilities. There may be allocated time in their contract for these commitments, but due to the pressure from their clinical responsibilities, especially in the current climate with a global pandemic, this is often compromised as the hierarchy of needs will inevitably and justly ensure patient safety is prioritised.³⁹⁹ Work at an institutional level between the medical school and the NHS trust is required to help these educators ring-fence the allocated time to ensure that not only is it not compromised but is also not perceived as a further burden on clinicians' finite time, which risks the interaction between educator and the student being negatively framed from the outset.

Being an educator is highly demanding, requiring the ability to take on numerous roles; facilitator, nurturing mentor, disciplinarian, diagnostician and modeller of the skills the students need.²⁷⁶ Remediation is resource intensive^{5,133,233,263} and requires significant time allocated to faculty staff to facilitate it.^{260,400} Students who require remediation often have greater demands on educators. At times, the lack of success from the remediation policies being delivered can be demotivating for educators who blame themselves for failing the student in their time of need.^{7,258} A strong desire and dedication from these educators is an important starting point, but there needs to be a concerted and structured program to support and develop them at an institutional level.²⁸² Unsurprisingly, experienced educators have better long-term outcomes than junior faculty when involved in remediation. This is attributed to their taking a more disciplinarian approach and greater comfort in pushing students outside their comfort zone.²⁷⁶ Educators often have limited educational experience or training in pedagogical theory and practice.²⁸¹ The interviews provided an opportunity for the students to reflect on their experiences and, crucially, through explorative questioning attempting to understand their experience, supported a deeper level of reflection which often led to conflictual answers as the nuances of the issues became apparent. Maybe this should not be surprising given that the researchers enter the interviews having performed literature reviews to understand the current knowledge in the field in combination with their invested interest in the topic and the time and support that goes into creating the interview guide, which the tutors/mentors will not have. On an individual level, educators need to develop the ability to judge medical learners' performance across various competencies, develop

facilitation skills and cultivate emotional intelligence and courage.²⁸² There is a need for these educators to be trained appropriately to improve their awareness and understanding of the underlying drivers and contributors of academic difficulties the students may face. In addition, training in supervisory techniques such as creating an open and trusting relationship, asking the appropriate and important questions and providing constructive feedback is important.³⁹⁹ There is a need for culturally competent supervision that values the diversity that different cultures bring and understands that each individual is unique with their distinct self-identity and experiences that have shaped their understanding.^{399,401} This will help empower students, especially from non-traditional backgrounds and improve the cultural diversity at the institution with improved communication, reflection, sharing of ideas and problem-solving.^{399,401-403} In remediation literature, there have been calls to produce communities of practice of highly motivated educators that develop specialised areas of expertise.^{5,7,282} This can be expanded to include all educators mentoring or supervising students. This may help change the culture of remediation as a punitive process and begin to integrate it within the curriculum.^{4,133,239,240} These communities would allow those involved in mentoring/supervision access to the knowledge and current understandings about the challenges the students may face at academic, psychological and cultural levels as well as best practices to combat those issues.

Another positive attribute of the interviews that were not present in the interactions between the tutors and students was a clear and explicit purpose for the meeting, which is an essential requirement for beneficial supervision.³⁹⁹ Prior correspondence enabled the content of the meeting to be clarified, which allowed both the interviewer and interviewee to prepare and consider what aspects were necessary for them to discuss. As Katie stated in her interview, whilst she described a positive relationship with her tutor, she often had not considered what was going to be discussed, leading to the limited utility of the meeting and superficial discussions around her experiences at medical school.

Because the participants were engaging in a voluntary process, they had the power to arrange the meeting time and set boundaries regarding the topics to be discussed. However, setting up a mentorship program on a purely voluntary basis remains problematic. Many of the students most in need of additional support are those least likely to engage with and access these services due to poor self-assessment skills and the potential stigma associated with accessing additional services.^{174,247,248} The benefits of allowing students to choose their mentors/supervisors are promoted in the literature as preferable. It allows the development of more natural, comfortable and effective relationships^{395,397,404} in comparison to the assignment of supervisors by the institution, which can be perceived as being forced upon the mentees.³⁹⁶ This is an interesting

consideration, but how this would be established within a medical school is unclear and may be unrealistic. The relatively small pool of potential mentors and the lack of interaction between mentors and mentees - especially in the pre-clinical phases of the course - means that it is unlikely that the students will be able to develop those relationships to identify the most suitable tutor. Feelings of a lack of belongingness and the existence of power differentials within the clinical environment are additional barriers to this being a realistic proposition later in the course.

Chapter 6 will expand on how the findings from the three components of the dissertation help us to consider and address some of the situational, dispositional and institutional factors associated with poor academic performance as well as discuss the need to consider whether the ranking process is an appropriate way of selecting doctors for their foundation posts. Finally, I propose ways of integrating early assessment prediction tools within longitudinal support systems to improve methods of offering support to all students and help integrate remediation within the mainstream curriculum.

5.8 Strengths and limitations

This section describes how Yardley's ⁴⁰⁵ criteria for evaluating quality in qualitative research were addressed in the study.

Criterion 1: Sensitivity to Context

The extensive literature review described in the introduction was supplemented by the analysis conducted in the scoping review to ensure an in depth understanding of current theories regarding academic underperformance were described. This influenced the development of the topic guide that was utilised in the study which was an iterative process that allowed for the addition of novel topics of interest raised by participants to be explored in subsequent interviews. Some examples of this include; the role of academic tutors and their limitations, the impact of structured learning tools such as logbooks and the long term impact of ranking. The social context and my characteristics as the interviewer and the impact of this on the study are discussed in greater detail in section 6.7.

In attempts to ameliorate power imbalances between myself, as the researcher, and the participants, a stakeholder consultation was completed. Students who were not eligible to be recruited into the study were asked to complete a questionnaire to ensure the terminology in the documentation sent out to participants was appropriate and that the duration of the interview and location was deemed appropriate and acceptable. Participants were also able to review their

transcripts prior to analysis and given the opportunity to redact or amend any responses to ensure the responses were an accurate representation of their beliefs and experiences.

Criteria 2: Commitment, Rigour, Transparency and Coherence

I attended multiple courses covering various qualitative methodologies and interviewing techniques prior to the development of the study to ensure the most appropriate methodology was used to answer the research question. I undertook pilot interviews to enhance the quality of my interview techniques and test the interview topic guide for clarity and appropriateness. Field notes were completed following each interview informed by the content guide from Phillippi and Lauderdale³⁶⁶ to provide a structure to aid reflection. Further discussions with one of my supervisors (RdV) was undertaken on a weekly basis during the process of data collection and analysis to discuss the findings from the interviews, emergent codes, issues that became apparent regarding my interview technique as well as any necessary adaptations for the topic guide.

Interpretation of the data was completed in a rigorous, structured fashion as described in Section 3.2.4. In which emergent themes were produced for each interview before an analysis for patterns across cases was completed. The emergent themes from individual interviews were compared with emergent themes formulated by my supervisor to check for consistency. Further exercises including stepping away from the data and formulating conceptual codes of the central themes from each participants' interview from memory and comparing and contrasting conceptual codes with findings from the literature review and scoping review were undertaken to aid the analysis as described in section 3.2.4.6.

To ensure transparency, illustrative quotes were presented in the analysis to support and justify the explanation and interpretations within the subthemes. The impact I had as the researcher on the data collection and interpretation is covered in detail in the reflexivity section 6.7.

Criteria 3: Impact and importance

The findings from this study are of both practical and theoretical importance. The student perspective regarding the negative consequences of a ranking system have been influential in changes to the national foundation job allocation process in which the EPM has been removed for future student cohorts starting in 2024. At a local level there have been changes to the role of academic tutors in line with recommendations from the thesis which has been adapted to become a mentorship program as described in section 6.4.2. The findings also identify ways in which non-traditional student cohorts are disproportionately affected by situation and

dispositional factors that impact academic performance as well as their sense of belonging. This is discussed in more detail in section 6.3.

This study was conducted in a single institution and selected participants to ensure a shared phenomenon was researched. As such, all the participants were placed within the lowest deciles of academic performance, and it may be unsurprising that they held mostly negative attitudes towards the ranking process. It stands to reason that those who place in the higher decile scores may have a more positive view of the process and potentially believe it does reflect their abilities and is a good surrogate for the skills required of a doctor. However, if we truly want to commit to ensuring the systems at the medical school are more equitable, we need to acknowledge their effects on those most negatively impacted, especially when there is evidence that students from non-traditional backgrounds are over-represented amongst those who achieve lower academic scores.^{111,144,189}

This small sample size, single institute, qualitative study does not aim to provide generalizability but instead offers a greater depth of understanding of how students who face academic difficulty experience aspects of the curriculum, support and the overall environment at the medical school.

The ranking system is a national system, and the findings remain relevant to all medical institutions in the UK. Selection for medical jobs in other countries varies, and this limits the relevance of the findings but may drive educators to consider the unintended consequences of the local systems on their students.

5.9 Conclusions

This study has shown us that overt failure is particularly challenging for students who are inexperienced with the phenomenon but provides a moment of reflection that has the potential to ignite a change in learning practices if students are supported through the process. In contrast, relative failure in relation to their peers is more challenging for students to understand and benefit from. This can perpetuate divides within student cohorts and act as a barrier to socialised learning and belonging that negatively impacts academic performance and the development of team working skills required in their future role as doctors. There are aspects of support and remediation that can be improved upon. A bottom-up approach involving the student voice can help guide policy changes, especially in the era of widening participation. However, educators engaged in remediation should note that not only is there a complex individual nature behind why a student requires remediation, but the students often struggle to identify their needs and

provide conflicting narratives when describing their desires from the course and support. In line with this, this cohort of students welcomed negative feedback to help develop SRL skills to better understand where their areas of weaknesses are.

6 Discussion

In this chapter, I will present a summary of the findings from the thesis and how they correspond to the objectives documented in section 1.5, indicating where the findings support or contradict the current literature, whether/how they agree or disagree as well as highlighting novel findings. The discussion then focuses on four main areas:

- 1) The impact student agency and positionality have on the student perception of the medical school and how this affects their engagement with support structures.
- 2) How financial and social capital contribute to an unequal experience of learning and performance, highlighting the need to address socio-cultural incongruence.
- 3) How support and remediation in medical education can be improved through integrating learner analytics with longitudinal mentorship.
- 4) An exploration into the negative consequences of ranking medical students and whether the current format of the foundation job application process remains equitable and suitable.

6.1 Summary of results in relation to research objectives

The thesis aimed to investigate the predictors of academic underperformance and explore the student perspective. Through understanding the personal and institutional contributors to academic performance, I hoped to explore ways to identify at-risk students earlier and identify ways to mitigate the drivers of poor academic performance.

Figure 6.1 depicts how the experience of academic difficulty on students is impacted by various factors at the macro (outside of the institution), meso (within the institution) and micro-levels (an individual's personal resource). Student access to informal support was considered a critical factor to support students to persist on the course after facing academic difficulty but was not equally available to all. The ranking system, hidden curriculum, learning environment and sense of belonging influenced student beliefs about the causes of their academic difficulty which impacted their behaviours when engaging with formal support available from the institution. All three levels contribute to student positionality and agency and this is discussed in greater detail in section 6.2. Dominant cultural norms, access to economic and cultural capital continue to contribute to the phenomenon on differential attainment. This is discussed in greater detail in section 6.3 when discussing ways in which support for widening participation can be improved.

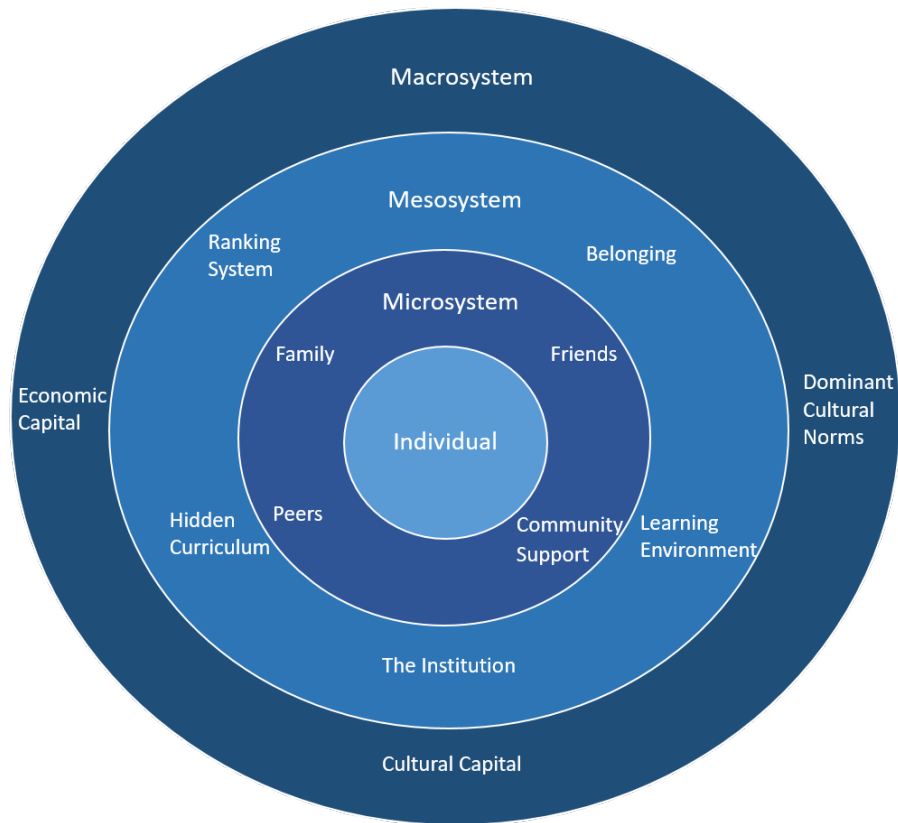


Figure 6-1: An ecological model of the factors that influence student understandings and behaviours when faced with academic difficulty

Objective 1: To explore the current literature regarding how students make sense of their academic difficulties

The scoping review highlighted the limited literature exploring academic difficulty from the student perspective in undergraduate medical education. The following themes relating to students experiencing academic difficulty were identified: the impact academic difficulties had on student identities and self-worth; maladaptive coping strategies utilised in response to these difficulties; students’ perception of the medical school as both a support structure and gatekeeper to their progression to a career in medicine. These are summarised in Table 6-1.

Table 6-1 Summary of findings from the scoping review covering the student experience of academic difficulties in medical education literature.

Findings from the scoping review:
Academic difficulties affected student identities and self-worth, negatively impacting their mental well-being.
Students adopted maladaptive coping strategies to cope with identifying as a failure or being perceived as a failure by others. This included misattributing and trivialising failure and withdrawing from their peers and formal support structures.
Students who struggle academically tend to be reluctant to, or are unable to self-analyse appropriately.
Some students are resistant to self-reflection, with a greater tendency to externalise the causes of their performance, providing a passive narrative of their experiences.
Medical schools are perceived to have a dual role as a support structure and gatekeeper to a medical career.
There is a general distrust by students of the medical institution, which is predominantly perceived as taking a punitive approach.
Support and remediation are perceived as 'too little and too late', making students feel let down and widening the divide between the students and medical school.
Students are aware that feedback can improve learning, but it is often too generic to provide benefits, including; enhancing self-esteem and confidence and was perceived as a tick-box exercise.
There is a disproportional lack of access to support for graduates, students transferring from other degrees and international students.
Students tend to approach peers rather than personal tutors for support in learning, which risks solidifying poor work practices.
Students tend to believe that personal problems are not legitimate reasons for failure result in delayed help-seeking.

The existing literature identified the need to improve support for students through what is often their first experiences of academic difficulty. It highlighted the importance of improving self-regulated learning strategies, that appear to be particularly challenging for students who face academic difficulty. The role student agency and positionality impacts how students perceive the role of the medical school and thus engage with official support structures was explored in the IPA study and is discussed in more detail in section 6.2. The desire for early identification of students who face academic difficulty was also noted to be of critical importance to these students. This supported the need to investigate ways in which early identification can be facilitated without stigmatising students.

Objectives 2 and 3: To investigate whether sociodemographic factors predict academic performance in medical school and to identify any evidence of differential attainment within BSMS to highlight student groups that are most affected.

All three components of the thesis addressed the issue of differential attainment. It is commonly accepted that differential attainment based on gender,^{40,42,143–145} ethnicity,^{42,144,189,190} being an international medical student^{145,202–205} and entry pathway to medical school^{111,190} exists. The cohort analysis supports these findings with evidence that male students, students from ethnic minority backgrounds, and those who entered medical school from any pathway that was not direct from A-levels were over-represented in the lower deciles of performance. The study identified that, in particular, students who attended medical school following Access courses were particularly overrepresented in the lower deciles. This cohort analysis is the first study to identify students with disclosed mental health difficulties on entry to medical school at higher risk of lower decile placement (*Table 6-2*). The analysis did not find evidence that IMS students or those with learning or physical disabilities were at higher risk of lower decile placement. The scoping review and the IPA study provide explanations behind the phenomena when exploring the differential access to financial and cultural capital (*Table 6-5, Table 6-6*), which is explained in greater detail further in this chapter.

Table 6-2 Summary of findings from the retrospective cohort analysis regarding evidence of differential attainment

Evidence of differential attainment identified from the cohort analysis
Lower attainment among male students, students from ethnic minorities, students with disabilities, and students who enter medical school through entry routes that are not school leavers are confirmed in this study.
Students who attend via Access courses are at particularly high risk of lower decile placement.
This is the first study that identifies that disclosing a mental health condition before starting the course is associated with lower academic performance.

Objective 4: To identify whether early assessment scores predict ongoing student academic performance and which assessments have the strongest association.

Findings from the retrospective cohort study (*Table 6-3*) contribute further evidence that early assessment scores can predict ongoing academic performance.^{151–153} The results also support calls for multimodal assessment to be used^{5,133} when identifying at-risk students, as including multiple assessments increased the degree of variance identified in the predictive models. Only a few assessments were required to explain the maximal variance in performance predicted by the models in our cohort analysis, which should abate fears that the need to obtain multiple measures of performance will delay the provision of timely support.⁵

Table 6-3 Summary of findings from the retrospective cohort analysis regarding early assessment predictors of academic performance

Early assessment data findings:
<p>Early assessment performance is predictive of ongoing academic performance:</p> <ul style="list-style-type: none"> • Knowledge tests (SBAs/SAQs/MCQs) and OSCEs have the strongest association • For most students, performance is stable over time • There are a proportion of students for whom academic performance is very unpredictable
Multimodal assessment increases the explained variance in performance seen in the predictor models.
Educators do not need to delay offering support by waiting for students to complete a large number of assessments before all the variance that the models can predict is identified.
Predictive modelling should be used with caution as our strongest models could only explain 50% of the variance seen in academic performance.

Objective 5: To explore students’ who face academic difficulties accounts of their experience of assessment, teaching, learning, and support. To explore whether these accounts can provide new perspectives that can drive change in assessment, supervision, curricula design and selection processes for future cohorts.

Some of the findings from the literature (Table 6-1) are re-affirmed within the student narrative in the IPA study in chapter 5 (summarised in *Table 6-4*, *Table 6-5*, and *Table 6-6*). The participants described failure as a new and unexpected experience which they lacked the tools to navigate. This led to the adoption of maladaptive coping strategies such as withdrawal from peers and formal support and misattributing and trivialising failure.¹⁷⁴ The difficulty in self-analysing performance reported in previous literature^{174,247,248} was apparent: interviewees’ narratives described a lack of awareness of their difficulty until the experience of failure occurred. The interviews in the IPA study supported prior findings that the research interview provided an opportunity for self-reflection and behaviour change.¹⁷⁵ Some students have a greater tendency to externalise failure and resist self-reflection, limiting their ability to adapt and develop their learning approaches.^{174,175} As described in chapter 5, failure is more nuanced than previously described in the medical literature and can be beneficial if harnessed appropriately as a catalyst for change. The student narrative indicated that the degree of behaviour change was limited if failure was not experienced or occurred in assessments perceived to be less associated with their future job role. In addition, failure in formative assessments had less impact on behaviour change and was discussed as a contributing factor in the development of poor study habits.

The scoping review identified the dual role of medical schools as both the primary source of

support and the gatekeeper to a career in medicine.¹⁷³ In the review, there was a perception that students distrusted the medical school, and described it taking a predominantly punitive approach. However, the student narrative in the IPA study identifies the importance of positionality in how students perceive the actions of the medical school. Students who experienced the medical school as representing the same values- system, and moral code as them are more likely to perceive the institution, faculty and support structures as beneficial to their learning, and therefore they are more likely to engage. Conversely, those who take a more adversarial position perceived the curriculum, assessment, faculty and support as tick-box exercises that were additional barriers they needed to overcome to succeed.

Table 6-4 Summary of the similarities and novel findings between the scoping review and the IPA study regarding student experiences of failure

Similarities
Failure is a new experience for medical students who lack the tools to manage the experience.
Failure challenges students' self-perception and sense of self-worth.
Students who face academic difficulties struggle with self-assessment.
Failure is a negative psychological experience – degrades mental well-being, which is more concerning when combined with findings from the cohort analysis that students with mental health conditions prior to starting the course are over-represented in lower deciles.
It is more challenging to support learners with a greater tendency to externalise the causes of their performance and are more resistant to self-reflection.
Students utilise maladaptive coping strategies, including withdrawing from peers and formal support, to protect their sense of self.
The medical schools' dual role as a support structure and gatekeeper is apparent and predominantly seen by students as taking a punitive approach.
Novel
The effects of failure can be longstanding and persist despite future good academic performance.
Failure can be positive as it acts as a catalyst to change learning practices and help-seeking behaviours well as improve motivation.
Knowing of other students who face academic difficulty reduces the stigma attached to failure – a potentially missed opportunity for peer support.
Not all failure is equal – multiple failures and failures in assessments perceived to be more closely linked to future job roles had the greatest likelihood of instigating self-reflection and change.
Failure in preclinical assessments and formative assessments may have a reduced effect on their self-worth but also reduced the likelihood of behaviour change and, in some instances, contributed to the development of poor study habits.
A lack of failure reduced the likelihood of behaviour change and contributed to students persisting with inefficient learning strategies.
The medical schools' dual role is more nuanced than previously identified, and the student perspective is driven by the presence or lack of shared morals and values with the institution, which impacts help-seeking behaviours.

The students in the IPA study shared concerns that remediation came too late,^{173,174,260,317} and they welcomed the development of tools that aid early identification of those at risk of poor

academic performance to ensure timely support is made available.²¹ The stigma associated with academic difficulty is a barrier to self-referral to support, in addition to concerns that there is a lack of legitimacy in accessing support until failure has occurred. Comparisons were drawn by participants between the accessibility and utility of academic and psychological support. There appear to be positive approaches taken by student support services that could be utilised to improve the provision of - and student engagement - with academic support, including; making students aware that it is not uncommon to need academic support during their journey as students, improving the clarity of how and when it is appropriate to access the services and emphasise the need for students to be active participants in the process.

Table 6-5 shows that the IPA study identified a number of reasons that current support structures, such as personal tutors, remain underutilised, as well as the logistical barriers to accessing external support. In section 6.4.2 I discuss ways of integrating the predictive models described from the cohort analysis with longitudinal mentorship programmes to improve the delivery of this type of support. The student narrative also highlighted the creative ways in which students construct informal support networks that were perceived to be crucial to their ability to persist on the course when faced with obstacles. However, some of these networks are not equally available to all students and may contribute to differential attainment. Chapter 5 describes peer mentorship's potential benefits in improving all students' access to informal support networks.

Table 6-5 Summary of the student experience of support identified in the IPA study

Student's experience of support
<p>Early identification of the risk of future poor academic performance is important to students.</p> <ul style="list-style-type: none"> • Acknowledgment that self-assessment is challenging. • Lack of clarity regarding the best way to implement this – concerns over increased frequency and mode of assessment and the accompanying anxiety.
<p>Students must be encouraged to participate actively and 'make the first step'.</p>
<p>Learning from student support services to improve student self-referral to academic support:</p> <ul style="list-style-type: none"> • Explicitly making students aware that needing support is common may help reduce the associated stigma • There is a need to create clear, transparent access points to academic support • Lack of legitimacy of those in positions to offer support.
<p>Academic support perceived to be more available in clinical years than preclinical years – strengthens student belief that preclinical years are less important.</p>
<p>Clinical tutors are underutilised</p> <ul style="list-style-type: none"> • Lack of regular meetings. • No development of a working relationship • Students perceive their issues and concerns are not legitimate.
<p>Logistics of accessing external support can act as a barrier – especially when accessing formal mental health support.</p>
<p>Students are active and creative in developing informal support networks</p> <ul style="list-style-type: none"> • Perceived to be central to their ability to persist on the course and overcome adversity • Not equally available – disproportionately less available to students from non-traditional backgrounds.
<p>Support to students from widening access groups is perceived to be insufficient.</p>

The student narratives in the IPA study strengthen prior findings in the literature of the complex interplay between the situational, institutional and dispositional factors that impair academic attainment, including; employment pressures, financial limitations, poor health, availability of informal support networks, characteristics of the institution, availability of support services, student demographics/characteristics and the sense belonging.^{26,27,117,118} Beyond the impact of financial pressures and the need to obtain paid work during the course has on the time available to students for study,²⁶ the IPA study also identified how financial pressures limit social integration, the ability for students to belong and contribute to increased stress and anxiety impacting mental wellbeing. A sense of belongingness or lack of it was consistently noted by participants as a barrier to accessing both formal and informal support and was heavily influenced by the perceived institutional values and the culture and environment amongst the student cohort. What is meant by belongingness, what that asks of the students and the need to question it is discussed in greater detail below.

Table 6-6 Summary of the interplay of situational and dispositional factors and belonging on student experiences of academic difficulty from the IPA study

The interplay and impact of situational, dispositional factors and belonging identified from the IPA study
<p>Situational factors such as financial implications are more complex than previously described;</p> <ul style="list-style-type: none"> • Not only is there an impact on the time available to study, but financial limitations reduce the ability for students to develop relationships amongst their peers, impacting their sense of belonging (e.g., not living in student accommodation/having the time or money to attend social events). • Financial implications of failure and the potential need to re-sit a year is an additional stressor, particularly for those who are financially constrained, contributing an extra layer of stress and anxiety.
<p>The sense of belonging impacts dispositional factors including student motivation, student learning and help-seeking behaviours;</p> <ul style="list-style-type: none"> • A sense of belonging within the institution is impacted by whether students perceive the medical school as sharing their morals and values <ul style="list-style-type: none"> ○ If these are shared – the institution, educators and support structures are perceived positively, and students are more likely to engage ○ If these are not shared – the curriculum, faculty and support are perceived cynically and not to be acting in the student’s best interest – leading to rejection and lack of engagement – furthering the polarity of the dual role of the medical school, as previously discussed • A sense of belonging amongst their peers was considered important for students to access the benefits of socialised learning and improve self-regulated learning skills. • Belonging to the peer group necessitated being able to ‘fit in’, which was more challenging for some. Student-reported barriers include a competitive, cliquey, insular and suffocating environment.

The IPA study is the first study that we are aware of that provides novel evidence of the student experience of ranking. There are many similarities described by the participants with the negative consequences of failure, including the negative emotional experience and the negative impact on their sense of self and self-worth, but noted there was a lack of a feedback mechanism to improve or change their learning practices (Table 6-7). The ranking system is perceived as unfair and a poor metric of performance that penalises students for poor performances early in their journey. It is considered to breed competition, leading to resources not being shared among students and reducing the development of good working relationships among peers. In section 6.5 I discuss the implications of these findings in combination with evidence of differential attainment and over-representation of certain student populations in lower decile placement when considering whether the current foundation job allocation process is adequate.

Table 6-7 Summary of the novel findings from the IPA study of student experience of the ranking system at medical school. This is divided into the similarities and differences students described of the experience compared to overt assessment failure.

Similarities
Negative psychological effect.
Increased stress and anxiety and degraded mental wellbeing.
A taboo subject that was not discussed amongst peers.
There were long term impacts –limiting future career aspirations.
Negative impact on identity and self-worth
Differences
It reduced the sense of accomplishment in passing assessments
It was perceived as unfair and unjust <ul style="list-style-type: none"> • An opaque and poorly understood system • A lack of standardisation within and across medical schools • A poor metric of their ability
The cumulative nature of scores = penalised for poor scores earlier in the course/did not account for ability to overcome adversity
Students' felt unable to learn from the experience – no feedback or way of 'improving'.
The system bred competition. Reducing shared learning resources and the development of good working relationships amongst peers.
Decile ranking had a greater negative impact on identity and self-worth - a continuous reminder of their position amongst their peers.
Students take a pragmatic but defeatist approach to the system to mitigate the effects on their self-worth.

6.2 Agency, positionality and dual roles

A key finding from the scoping review was the dual role the medical school has in the eyes of students, as both a supportive and punitive body.²⁷⁴ The papers in the scoping review revealed a general distrust from students in academic difficulty of the medical school, which was perceived to lean towards a more punitive approach.²⁷⁴ The narratives derived from the IPA study explain that the ways in which students perceive and interact with the medical school are more complex and dependent on positionality and student agency.

Positionality refers to the positions individuals feel obliged to take within the world in which they are participating.⁴⁰⁶ These positional identities relate to their sense of belonging and entitlement within the world they inhabit (in this case, as medical students) and are influenced by power, status and rank.⁴⁰⁷ It is important for medical schools to reflect on their beliefs about the causes of student academic difficulty and where they position themselves within the spectrum of competing responsibilities to society, the profession, and the student⁴ as this influences how remediation policies are designed, delivered and received.^{4,239,241} For example, institutional values

will impact resource allocation and influence whether funding is directed primarily to support the minority of struggling students or the needs of the larger student population who do not access these services.⁴ These unspoken, implicit values are part of the 'hidden' curriculum and influence how students position themselves in relation to the medical school, educators and their learning.^{174,175,318} Positionality and agency appear closely linked. Student acceptance of responsibility for their poor performance is variable; some students attribute the locus of control as internal and others as external, which impacts their subsequent actions.^{173,264,273}

Students who perceive their values to be closely aligned with those of the institution are more likely to see the medical school, the curriculum, assessments and faculty as supportive influences on their learning rather than representing potential barriers to their progression. Students who took this position in their narratives in the IPA study described taking agentic control of their learning, 'turning a negative into a positive', which involved; pursuing support networks, forming peer learning opportunities and developing and practising new learning techniques. Despite this sense of agency, creating these support networks was difficult. The participants described 'the need to take the first step' and accept that they were a student in difficulty, thereby exposing their vulnerability. The literature suggests that these students tend to be less challenging to remediate and are more likely to have positive relationships with faculty who are perceived as allies and, in doing so, are considered more enjoyable to teach.³⁸⁵

In contrast, the students who positioned themselves and the institution within an adversarial relationship tended to take a sceptical view of their interactions with the medical school and perceived faculty to be unsupportive.³⁸⁵ In the IPA study, students who took this position had a greater tendency to externalise the cause of their academic difficulties. That is not to say they lack agency, but their agency is directed at overcoming what they perceive as irrational hurdles the institution places to obstruct their progress.³⁸⁵ A lack of trust in the institute directly impacts how the curriculum, assessment and support are received and can act as a barrier to engagement. Additionally, students who do not believe the problem lies within themselves are unlikely to utilise the support available, despite an awareness of its existence, due to this misalignment between their beliefs of the causes of their difficulties and the support available. Fractured relationships between students and the institution play out in interactions with faculty, and this may evoke negative emotions and responses from educators attempting to offer remediation, leading them to reject the student. Interpersonal theory helps explain how conflictual educator-student interactions can manifest when students are hostile towards educators, and this is reciprocated with hostility from the educator, leading to a downward spiral into negativity.⁴⁰⁸

6.2.1 Potential solutions to combat the development of adversarial relationships between the student and institution

The development of trusting relationships between the faculty and students may help make student beliefs and assumptions explicit, whether or not they are deemed legitimate by faculty. Once known, they can be addressed and, when appropriate, contested. The development of student-institution partnerships in which students participate in governance processes and co-construction of assessment tasks and curriculum design may help student belonging and improve engagement.³⁹¹ Taking this approach also invites the potential of opening a two-way dialogue in which student concerns can be fed back to the institution, influencing decisions on whether adaptations to future policies are necessary.

Institutions are encouraged to produce transparent and well-articulated remediation policies that set out the institution's expectations from the course, the structures available to support students who face academic difficulties, and the final outcomes should the required standards for progression not be met.⁴ Raising awareness of these and making them easily accessible to students may also improve trust.

Student positioning is not inherently fixed, and there are opportunities to break the cycle of distrust and rejection necessary to enable students to benefit from processes in place to support them.³⁸⁵ Teaching educators to refrain from responding negatively in interactions, and to explore the student's concerns, whilst challenging them to critically reflect on their own assumptions and beliefs, may lead to more positive interactions with students.⁴⁰⁸ Therefore, there may be benefits to teaching educators about the role interpersonal dynamics plays in the development of relationships to provide strategies of managing students who take a more adversarial position of distrust.

6.3 Supporting widening participation and addressing differential attainment

This thesis further supports the evidence that differential attainment exists amongst medical students, with white and female students outperforming their peers.^{145–148} It adds to the evidence that students from ethnic minorities, older students, gateway students and students with known disabilities are overrepresented in the lower deciles of academic performance.^{111,113,114,190} This thesis has identified that amongst the disabilities that students have disclosed prior to entering medicine, pre-existing mental health conditions account for the

majority of the contribution to this awarding gap. This thesis has also provided evidence that the awarding gap remains present across a multitude of assessment modalities.

The IPA study highlighted ways financial pressures and the importance of belonging contribute to differential attainment. This phenomenon is analysed below through the lens of Bourdieu's theory of capital;¹⁹⁸

- Economic capital refers to the monetary resources a student has access to,
- Social capital refers to the people and social networks the student has access to,
- Cultural capital refers to the non-economic resources such as knowledge, skills and education obtained over time through the socialisation to a culture and tradition.

The following sections illustrate the impact reduced financial, social and cultural capital has on academic performance and suggest ways in which these can be addressed.

6.3.1 Economic capital

The financial burden of the course was a central component of the narrative of those participants from underrepresented backgrounds in the IPA study. The practical implications of the necessity for paid work have been noted in previous studies¹⁸⁵ and were echoed by the participants in this study, noting a lack of time for studying and the extra time and mental commitment of their paid jobs. I have shown that even in the absence of failure, relatively poorer academic performance can have adverse psychological effects and that the lack of financial stability was a considerable additional source of anxiety. This reflected the findings of previous studies.^{409,410} Furthermore, financial debt anxiety contributes to poor academic performance,⁴⁰⁹ thus has the potential to create a negative cyclical effect. What has not been identified previously is that the financial burden becomes more problematic in the latter years of the course due to reduced time available for students to obtain paid work and a reduction in the financial support available from external sources, such as student loans and bursaries. Some of the participants were unprepared for this eventuality and had not accrued sufficient savings to cover these costs, leading to one participant needing to defer a year of study to accumulate enough funds to reduce the financial pressures on her final year.

Financial constraints also have a negative impact on belonging due to reduced availability to socialise and an inability to meet the associated financial cost of socialising. Deferring from study for a year resulted in one participant returning to an unfamiliar year group, requiring them to form new social bonds to obtain the benefits of socialised learning, described in chapter 5. The

perceived lack of financial support and negative attitudes from fellow students were found to compound the sense of marginalisation and feelings that the course was not designed for students like them.³⁸⁷ This form of marginalisation impairs the ability of students to form friendship groups, and this relative lack of peer connectedness has been shown to harm academic attainment⁹ forming another barrier to accessing the benefits of socialised learning.

The student narratives in the IPA study suggested that relative academic underperformance among participants may lead to self-imposed restrictions on career ambitions. The impact of financial constraints on academic performance is an additional contributor to the direct influence these constraints have on future career aspirations and speciality choices⁴¹⁰ due to the length and cost of training (including mandatory courses and membership exams).^{411,412} It may be unsurprising that students from non-traditional backgrounds apply for less competitive specialities, as influenced by an awarding gap in their foundation programmes selection scores and the additional financial considerations that accompany certain training pathways.⁴¹³

If there is a genuine desire to achieve greater diversity and improve inclusivity across all medical specialities, then improving financial support must be central to any discussion focused on combating the effects of differential attainment. Ideally, greater financial resources should be made available to certain student groups so that paid work is not required (although this option may be limited in the current economic climate). At an institutional level, more can be done to offer financial advice to students who rely on financial support and paid work to help them plan for the more economically and academically demanding latter years of the course. For example, there may be value in providing no-cost access to financial advisors with specific knowledge of NHS bursaries and the financial support opportunities available to medical students.

6.3.2 Social and cultural capital and belonging

‘Socio-cultural incongruity’ relates to the differences students from under-represented backgrounds have with the dominant cultural codes and practices of educational institutions in which they study.⁴¹⁴ The student narratives in the IPA study highlight ways this manifests at medical school. For example, students who are the first in the family to attend university have unequal access to informal support networks, which are considered by those who do have access as central to their ability to persist on the course.^{387,415} The results of the IPA study illustrated how this can worsen the sense of isolation, particularly during academic difficulty and reduce mental well-being.

Medical schools should be aware that exclusion impacts the ability of students to “*participate in (conversations about) key activities, leading to a perpetuation of their deficit in terms of social and cultural capital*”.³⁸⁷ A greater effort is required to improve inclusion. Institution policies and curriculum design have the power to promote inclusion and influence the development of friendship groups. Student narratives in this thesis have identified that friendship groups are often created early in the course, with connections made in halls of residence appearing key. This further disadvantages graduate students and those from lower socio-economic backgrounds that live at home due to family and financial commitments.

Institutions need to consider ways in which they can facilitate the creation of social connections for underrepresented students at medical school, because this could help to reduce the awarding gap and improve their learning experience.⁴¹⁶ Improving financial support may make the choice of residing in halls of residents more appealing for some of these students. In addition, promoting improved social integration, especially in the early parts of the first year, through academic and non-academic group activities is necessary.³⁸⁷ In the IPA study, the interviewees who found socialising challenging noted that the random allocation to student groups in their clinical rotation helped them to create connections with their peers. Their reports that these connections supported their learning echoed findings from previous research.¹⁹⁷ Randomly allocated groups predominantly occurred in the clinical years but could be replicated in the preclinical years in tutor groups and clinical attachments.

As mentioned in chapter 5, it may be worth exploring the development of peer-mentorship programmes for students, in particular from underrepresented backgrounds who may be better placed than faculty to offer practical advice regarding the best ways to navigate the system and ways in which they managed similar difficulties. Developing peer mentorship may also help create a community to improve the sense of belongingness at medical school. This may help their transition to learning in higher education, because “*students believed that working with students from their own background provides a network that is important for their learning and emotional transition*”.³⁸⁷

This thesis has already highlighted the potential benefits faculty mentoring programmes can have on all students, but it has also been previously shown to be of particular benefit for students from underrepresented backgrounds that found acclimatising to the clinical environment particularly challenging.⁴¹⁷ Students are also more likely to form social connections with faculty from similar backgrounds to themselves,⁴¹⁸ therefore, there is a need to consider ways of improving the diversity of faculty members,^{186,419} especially those involved in mentorship programs. Efforts to

support faculty members from under-represented groups are essential to mitigate the added burden of fulfilling these additional roles.⁴²⁰ This can include acknowledging that responsibility disparity of faculty members from under-represented groups exists and adjusting other responsibilities accordingly,^{420,421} assigning promotion value to these activities,^{420,421} facilitating and support relationships amongst faculty,⁴²² celebrating that faculty diversity benefits the institution,⁴²² facilitating faculty development⁴²¹ and implementing policies that eliminate all forms of discrimination.⁴²⁰

6.3.3 Mental health and academic performance

The retrospective cohort analysis is the first study to our knowledge that has identified that students with disclosed mental health conditions are over-represented in lower decile scores. This is an important finding as there is evidence that students' mental well-being deteriorates during the course.⁸ This overrepresentation in the lower deciles of academic performance may be attributed to the link between mental distress and lower academic self-efficacy, negatively impacting students' progress.^{127,182} Depression and anxiety can reduce cognitive function and affect memory and concentration, making it harder for students to acquire new knowledge and manage the stresses of the course, especially during examination periods.^{182,183} The narrative of students who described suffering from mental health conditions in the IPA study highlighted the logistical barriers and inflexibility of the external support systems as significant limitations.

The high prevalence of mental health difficulties^{8,9} suggests that there may be value in offering mental health services from practitioners who understand the specific demands of the medical course, with appointment times that suit students' timetables. A strength noted by students in the IPA study was the proactive approach support services at BSMS took to reduce the stigma associated with disabilities; participants praised the visibility, accessibility and welcoming environment created by student support, and this approach could be modelled at other institutions.⁴²³

6.3.4 Addressing socio-cultural incongruence – Potential solutions

6.3.4.1 Critical reflexivity

Critical reflexivity about how institutional practices reproduce inequities is necessary.⁴²⁴ Shah and Ahluwalia rightly highlight the need to consider how implicit sociocultural assumptions underpin how assessments are created and scored. They note that, "*what we measure and how we*

measure it is determined by what we value" (2019, p.427)⁴¹⁶ and that processes in place to assure that the minimum standards for safe medical practice are met can *"discount different ways of practising which are shaped by particular cultural influences"* (2019, p.427)⁴¹⁶ with the potential for disadvantaging certain students. There is a need to broaden the skills and attributes deemed of value that are more inclusive in order for assessment scoring to take into consideration the strengths of alternate approaches to practice.^{415,416}

Data analytics in education can help institutions and professional regulatory bodies combat socio-cultural incongruence as a monitoring tool. Generating performance trends across cohorts can identify patterns of differential attainment that require further investigation, encouraging necessary debate and reflection on the cultural and structural constraints that may impact students.^{424,425} Doing so can raise questions about the standards used within assessments utilised by medical schools and whether they are equitable.⁴¹⁶ Data analytics have already raised questions about the appropriateness of the tools currently in place for medical school selection and job application processes once qualified, which has led to policy changes, such as the introduction of aptitude tests and the switch to MMIs in medical schools admissions policies.^{108,109,111,290} There is scope to use data analytics to monitor whether the policies in place are reducing the awarding gap affecting under-represented students. Performance patterns can facilitate debate and reflection on the impact of policy change on the inequity of attainment, highlighting areas that require further development, improvement or diversion from current approaches.

Medical education should also consider following the shift occurring in other higher educational fields, such as the social sciences, by questioning what is meant by belonging and the impact it has on students. Guyotte et al. ask for future research to consider; *"what are we wanting students to belong to, why? When might belonging be undesirable? And, ontological questions: What does belonging do to/with students? What does it make possible? How might it constrain?"* (2021, p556)⁴²⁶ Exploring the views of policymakers and students on how best to answer these challenging questions may improve the alignment between the institute and the student populace when developing and implementing new policies.

Academic socialisation⁴²⁷ refers to ways in which students are supported to 'fit in' to the dominant cultural norms of their institutions. Whilst such socialisation may help students to succeed in the system as it currently operates, it can perpetuate the dominant social discourses, with the potential of framing traditionally underrepresented students as underprepared for the rigours of medical school. This approach risks the institution and profession failing to embrace the

contributions that a more diverse cohort of students brings to medical education.²³⁹ The institute has to be prepared to challenge the impact of dominant discourses and norms and the way in which this impacts the socialisation of its students, with potentially marginalising effects on underrepresented students. In doing so, institutions need to create space *“not just for new kinds of students but also for the knowledges and ways of knowing that they embody”*.⁴²⁸ (2011, p.679)

6.3.4.2 Institution-student partnerships

Developing institution-student partnerships is one way to improve belonging and address socio-cultural incongruence. Involving students in governance structures may enhance their sense of belonging to the institution, improve engagement in their learning,³⁹¹ and help students value the curriculum.³⁹² In particular, involving students from marginalised and under-represented backgrounds in co-producing the curriculum, teaching material, and assessment has been purported to potentially optimise four psychosocial constructs. These constructs are self-efficacy, belonging, emotional regulation and well-being.³⁹¹ Strengthening students’ beliefs that they belong at medical school and deserve their places on the course may enhance their self-efficacy, and this could result in greater engagement and success on the course, positively impacting their mental wellbeing.³⁹¹

An example of a successful institution-student partnership has been demonstrated in the movement to diversify and decolonise the medical curriculum.^{429,430} This has led to greater diversity in the case studies used in teaching, adjustment of laboratory reference ranges for differing ethnic groups, and teaching resources that demonstrate clinical signs and dermatological conditions in non-white skin.⁴²⁹ The partnership aims to help improve student awareness and preparation for caring for patients from diverse populations and signal a commitment from the institution to challenge dominant discourses to combat social inequality.⁴²⁹ This could improve the alignment between student and institution and the sense of belongingness.

There are risks to student-institution partnerships; the potential negative impact this may have on the participating students should be considered and should not further burden them.⁴³¹ Time is a premium for all students, even more so for students from under-represented backgrounds with additional financial and family commitments. Involvement needs to be on a voluntary basis, and the amount of time requested of the students by the institutions needs to be controlled to ensure this does not become an additional time burden, reducing their ability to study. This is particularly important given the findings from this study and others that students from under-represented backgrounds are at higher risk of attrition and relatively lower academic

performance. Institutions should also be obliged to remunerate students for their time, which may help alleviate some of the financial burden faced by this cohort of students.

6.4 Ways of improving support and remediation – integrating theory into practice

Only a small proportion of low-performing students self-refer for academic support.²³⁰ The scoping review and IPA study add to the evidence that this is, in part, due to students lacking the ability to accurately self-assess,^{174,247,248} the stigma associated with struggling academically, and concerns that accessing support is only legitimate once failure has occurred. Early identification is key to stopping the cycle of underperformance, and there have been calls to use multimodal longitudinal assessment data to help combat this.¹³³

6.4.1 Make what is known explicit – reducing the stigma of academic difficulty

Medical students, by the nature of the application process, are highly academically successful, therefore, academic difficulties and failure at medical school are unexpected shocks. This lack of experience or consideration of failure means they may lack the tools to navigate experiences of failure in productive ways.¹³³ Institutions need to do more to better prepare students for this potential outcome. The narratives in the IPA study indicated that psychological help-seeking behaviours were positively influenced by the support team's active role at BSMS to raise awareness of the prevalence of psychological issues medical students face and the likelihood of them requiring student support during the course. We know students find integrating large amounts of material, managing their time and taking a self-regulated approach to their learning difficult in preclinical years.^{136,137} Challenges in the clinical years include applying knowledge to clinical practice, examination skills, formulating management plans, communication skills and development of their professionalism.^{141,142} As educators, we accept that medicine is a challenging course and expect a significant proportion of our students to struggle at various points throughout the course. Reframing remediation as a natural and even a desirable component of medical education can destigmatise it, improving engagement and self-identification by students who face difficulties along the course.^{4,5} This could be achieved by making this knowledge explicit; dedicating time to a lecture early on in the course, referencing evidence that over a third of students seek out formal or informal support annually, may normalise this practice.⁴³² Many institutions have developed the infrastructure for supporting students but implementing the

above measures may be a low-cost way of enhancing the number of students who access these services. It may also help to reframe the discourse regarding remediation from one of deficiency to a zone of learning, improvement and development.^{5,133,240} Testimonials from senior students and staff describing healthy help-seeking behaviours and ways in which the different support pathways helped, as well as staff role-modelling self-care, may help change the institutional culture.^{133,239} Open discussion with faculty who have themselves faced academic difficulties but overcame them to accomplish successful careers in medicine may alleviate some of the anxiety associated with academic difficulties. Role modelling in this way may also reduce the self-imposed limitations that current difficulties will inevitably persist during their clinical practice.

The participant narratives in this thesis illustrated that the amount of support was not their primary concern but rather a perceived lack of clarity regarding what sources of support were available and how and when it was appropriate to access them. Given the abundance of information students encounter during the course, the notifications about support can be lost, especially when they are not deemed relevant to the student at points in time when they are not facing difficulties. Unfortunately, this can result in a misconstrued belief that support is non-existent if a time comes when they need help later in the course. Periodic reminders during the course may mitigate this effect, as could a robust personal tutoring programme.

6.4.2 Integrating predictive risk scores into longitudinal support

We live in a world with greater access to large quantities of student data, from pre-admission academic achievement to aptitude test scores and performance measures at medical school. Institutions and professional regulators have and continue to use predictive analytics and learning analytics (LA) to forecast future academic performance, inform admissions policies and assess and defend the inclusion criteria used in the selection processes for jobs once qualified.^{22,31,54,55,151–}

^{153,32,37–40,51–53}

The retrospective cohort analysis described in chapter 4 provided supportive evidence that early assessment scores predict ongoing success, and I discuss how these findings can be implemented to improve timely academic support for students. Here we note the potential risks of the use of data analytics:

1. A risk of using data analytics from big data pools is that the results are considered objective as they have been obtained through rigorous scientific enquiry, in which the researcher is considered a neutral component. However, these results only explain 'what' patterns and

associations have been identified. They do not explain 'why' these patterns exist or what drives them. The patterns are also a reflection of the measurements that were included, how the data were handled, analysed and interpreted. Reports of quantitative research rarely specify ontological and epistemological foundations or potential biases.^{433,434} Quantitative researchers can benefit from using reflexivity to help consider how they impact the study design and interpretations to improve the quality of the research, acknowledging that neutrality and value-free knowledge does not exist. This is of particular importance in education performance analytics, in which the degree of variance explained by predictive models remains low to moderate.^{58,65,290,301} How an author chooses to describe their results will impact the way they are received. The results from the predictive models in this thesis are a good example of this. For example, I could correctly describe that predicting 50% of the variance seen in future performance as evidence that those who perform less well early in the course are much more likely to do so later in the course. However, I would be failing to adequately contextualise the results, which also show that the model was only able to predict 50% of the variance in factors that impact future academic performance, meaning that many factors remain unknown, unmeasurable and/or unpredictable.

2. The predictive models in the cohort analysis also highlight that knowledge tests and OSCEs were better predictors of lower decile outcome than other assessment modalities, such as portfolio scores. However, this could simply reflect that these assessments hold greater value in the outcome variable, and thus students who perform better at those assessment modalities continue to do so. This has the potential of devaluing the other assessment modalities as they do not appear to add to the explained variance in the models, however, this may be because they are assessing a different set of skills not included in the outcome variable. This may also help explain why the strongest predictors of ongoing academic performance in medical education research tend to be prior assessments that test the same skill sets.^{65,301} For example, the finding that A-level performance is a strong predictor of undergraduate knowledge test scores and, subsequently, performance at postgraduate exams which was described in the 'academic backbone' by McManus et al. (Chapter 1.2.1.1).²²
3. Data-driven approaches to understanding learning outcomes also risk simplifying the complex nuances of human processes and ignoring social contextual factors.⁶⁹ The use of predictive modelling should be considered in the socio-cultural context in which it exists, and with caution, as when used to drive selection policies in medicine, it runs the risk of strengthening existing social hierarchies, further disadvantaging marginalised student cohorts.¹⁹⁹
4. Using LA risks 'profiling' students in which cohort data is extrapolated to target individual

students based on their characteristics.⁴³⁵ Whilst our study has shown that we can predict cohort risk, it is not possible to do so at an individual level. Our research supports previous studies that it is not possible to predict which individual will remain in the lower decile and which will be able to surpass the expectations of the model.¹⁵³ This needs to be accounted for if these models are used as early warning scores, especially due to the risk of stigmatising students, which has already been shown to impact help-seeking behaviours negatively and may reduce self-efficacy, hindering future performance.^{264,274,436} Early warning scores may also disproportionately impact marginalised student communities who are more likely to be highlighted in these systems as they are over-presented in the lower deciles of academic performance.^{111,113,114,190} This could further the belief that they are under-prepared for the course rather than opening up the discussion of structural disadvantages they face, which I have alluded to earlier.²³⁹

6.4.2.1 An integrated model of analytics and mentoring

To mitigate some of the drawbacks of using learner analytics, I propose a model of integrating predictive scores within the longitudinal mentorship approach discussed in Chapter 5. This draws on Bennion's athlete and coaching model,¹³³ in which the academic tutor plays the role of the coach. This longitudinal model, available to all students with a focus on utilising the available time and the development of a trusting relationship to discuss and identify issues that may impact academic performance, can help bring remediation into the mainstream curriculum.^{4,133,239,240} Data analytics can be helpful to the academic tutor by informing them of the current performance metrics of their student to identify areas of strength and weakness.^{274,317} Predictive models, such as the one created in this thesis, would also be able to identify the most predictive assessments of ongoing academic performance to guide the coach and ensure they do not get lost in the abundance of data available. Formative assessment performance data and evidence of student engagement can also be included in these longitudinal models. Ensuring actionable feedback is incorporated into this model might allay student concerns that medical schools will use their performance data as a way of 'policing' them rather than to support their learning.^{274,437} The benefits of including formative assessments are that they are deemed less stressful and considered helpful for students to gauge their performance. There is evidence that regular formative assessments improve final summative performance, particularly for students at the lower end of the spectrum of scores.³⁸⁴ However, our study has shown that the degree of reflection and behaviour change is less apparent when formative assessments are failed, compared with summative assessments, and thus I would recommend the inclusion of both formative and summative assessments to support forming these individualised plans.

Having specific data metrics has the potential to improve the structure of the meetings between tutors and students and help set clear expectations for both parties. Using data to frame and open the “*diagnostic conversations*”²⁵¹ or “*diagnostic interviews*”¹⁵⁴ to gather information may help contextualise the external factors that impact students’ academic performance and approaches to study.^{154,251} Educators can challenge the students to reflect on their experiences and develop individualised learning plans with opportunities to reflect and review their progress at the subsequent meeting.^{4,258}

Having this ‘coaching’ system available to all students may help bring the concept of remediation into the mainstream curriculum in which every student is considered able and talented, but with areas that can be optimised, this may help reduce the associated stigma of requiring extra support.^{4,133,239,240} This proposed system may offer some degree of remediation by proposing strategies to improve students’ learning and help-seeking behaviours but would need to sit adjacent to other support programs that can offer additional support if required. We propose that the support should address cognitive and affective domains of learning and improve students’ SRL techniques^{5,21,154,174,262,263}, which have been shown to improve academic outcomes, support adaptive learning approaches and improve help-seeking behaviours.^{174,263,265–267}

Participants in the IPA study perceived the people offering support as lacking legitimacy, which was a barrier to utilising the support. Clinical educators inherently have this legitimacy as they perform the role medical students aspire to fulfil. Therefore, they may be best placed to take on the role of academic tutors in a mentorship/coaching capacity.²²⁹ There are similarities between clinical reasoning and clinical skills remediation practices, such as diagnosing learning difficulties, providing ways of managing these issues and monitoring and reflecting on the process.²²⁹ These educators also need to be familiar with the curriculum, structures of support and dismissal policies and have the confidence to challenge students.^{5,258,276} Clinical educators may have some existing skills well suited to this role, but the position also requires specific training and ongoing developmental support. Some of these skills can be learnt through formal educational qualifications, which are becoming more frequently part funded within educational roles available to clinical staff.^{229,438} As we have demonstrated in this thesis, the reasons students face academic difficulties are complex and intertwined with psychological, behavioural, socio-cultural and contextual issues. Therefore, there is a need to develop communities of practice made up of a multi-disciplinary inter-professional team of remediation experts made up of educationalists, psychologists and social scientists.^{5,7,229,282} This may help develop specialised domains of expertise to improve the early identification of struggling learners and develop more creative and holistic support services.

For this system to function optimally, there is a need to share students' academic records with the tutors to provide ongoing longitudinal support and student growth.^{254–257} The sharing of these records should be limited to the tutor and those involved in further remediation support if required. This would reduce the risk of breaking confidentiality or creating educator biases in which the knowledge of a student's prior performance influences how assessors rate their ongoing performance.^{238,252,253} Ideally, academic tutors should not be involved in future summative assessments of their tutees to reduce positive or negative bias effects unless the assessments are anonymised, although this may not always be feasible. As proposed by other authors who support learner handover, it is imperative that medical schools establish transparent policies that clearly outline the circumstances in which student assessment information is shared and that it occurs with the student's knowledge and is only shared within a limited group of medical school faculty who can support the remediation goals.^{5,254,256}

6.5 The role of ranking in the foundation job selection process

The IPA study addressed the impact of ranking on students - a topic not previously described in medical education literature. The findings add to current concerns about the appropriateness of the foundation job selection process.^{50,290,299,304} Controversies spurring the debate in the literature have centred around whether the current tools, namely the EPM or the SJT, are good metrics to predict the future performance of doctors and, if so, what level of weighting should be given to each.^{50,290,296,299,304} But there has been little consideration of how the application process is perceived and experienced by students.

This section predominantly focuses on the issues highlighted in this thesis about the perceived equity and impact of the EPM. However, we would like to draw attention to the problems regarding the SJT that have already been mentioned in the introduction. These include the limited predictive validity of the SJT,²⁹⁶ and the fact that the majority of scores clustering close to the mean such that small differences in raw scores heavily influence the overall application score.^{291,297} The degree of the weighting of marks for the SJT, a singular test, has also been questioned when contrasted with the numerous assessment marks achieved over the duration of a medical course.⁵⁰ Finally, one must question the appropriateness of using a test that was not created for the purpose for which it is being applied. The SJT was rarely discussed in the study interviews, which may be a reflection that some of the participants had not sat the assessment, and that it did not contribute to their experience of medical school at the point of the interview. In addition, as a point-in-time assessment with no apparent benefit to their learning, it did not

appear central to the narrative of their experiences at medical school or appear to contribute to their sense of self or their abilities. If mentioned, it was considered an 'odd' test that was an accepted, if not well-understood, part of the application process. Despite its weight in the application process, it did not appear to reflect the same amount of emotional importance as the decile score.

6.5.1 Unintended consequences of ranking students

To the best of our knowledge, this is the first study that has investigated the effect of ranking on the educational environment, including the students' mental well-being, learning, help-seeking behaviours, self-efficacy and sense of belonging.

The concerns raised in the literature - that the decile rank is an inadequate system for national selection due to inter-school discrepancies^{299,300} and a lack of standardisation across medical schools⁵⁰ - were shared by the participants in this study. Furthermore, findings from this study highlight the importance students gave to relative failure in the form of being placed in the lower deciles. Outright failure may or may not be perceived as fair, but the associated transparency of failure made dealing with, managing and learning from the experience a more viable possibility.³⁸⁶ Ranking was also a continuous reminder of their relative underperformance rather than an event in time that could act as a catalyst for behavioural change. The lack of accompanying feedback makes learning from the process difficult. Ranking, therefore, sits in this liminal space of existence, continuously positioning the students to signify their 'ability', a classification system that inherently feels unfair, lacks clear transparency and breeds competition. The students may not believe that it reflects their ability to perform as doctors, yet it contributes to their sense of self, generating an internal struggle. It remains an ever-present reminder to students of their worth relative to others in their cohort. A lack of an open dialogue with their peers and the medical school means it is never processed.

6.5.1.1 Ranking increases divide and distrust in the medical school that is 'blamed' for the system

Ranking scores are created and delivered by medical schools to their students, and therefore the frustration students feel towards the system is directed at the medical school rather than the UKFPO. As noted in the scoping review in Chapter 2 and as discussed above, students who face academic difficulty often distrust the medical school, which is positioned as the gatekeeper to a successful career in medicine;²⁷⁴ the ranking process appears to deepen this divide. Through the

ranking process, the medical school is perceived to be placing barriers to future success (future job opportunities in this case) rather than as a supportive structure. This is compounded by the lack of feedback accompanying the ranking system, making it difficult for students to understand and learn from. These factors contribute to a sense of inherent injustice and belief that, as students they are not valued by the medical school.

6.5.1.2 Ranking increases competition and reduces self-efficacy

Introducing systems into medicine that further increase an already competitive environment can be harmful to students, patients and the profession. A central tenet of the GMC's professional standards expected of qualifying doctors is to maintain effective teamwork and interpersonal relationships to optimise patient care.⁷³ Increased competitiveness reduces the likelihood of students sharing resources and working collaboratively to meet this professional requirement.⁴³⁹ A ranking system that pits one doctor against another risks teaching behaviours in which personal development and growth are prioritised over collaborative development of the cohort and promotes performance-orientated behaviours rather than deeper learning. The IPA study supports the findings that some students choose to conceal and withhold information that would help their colleagues in order to obtain an advantage.⁴³⁹ These dangerous behaviours can eventually negatively affect patient care and should be discouraged. Systems that contribute to the development of these beliefs and behaviours should be reviewed and considered for removal from the medical course. A competitive environment may also limit the implementation of peer-peer teaching and support programs which are most beneficial for those who are facing academic difficulties and who struggle to create social networks independently.

The interviewees described the ranking process as contributing to a more competitive environment which has been shown to increase stress levels, reduce mental well-being and increase substance misuse, negatively impacting academic performance.^{440–442} There is a high prevalence of distress amongst newly qualified doctors, with the medical course contributing to depression and burnout,^{8,9} which needs moderating rather than propagating.

Finally, this thesis has shown how placing in the lower deciles of academic performance reduces self-efficacy beliefs, which has previously been found to harm academic performance.³² Low self-efficacy beliefs also have the potential to limit future career aspirations. In addition, the hierarchical nature of the ranking system implicitly teaches students that academic skills are predominantly valued over the other skills required to be a doctor, which has the potential to impact what specialities students pursue. This is described in the next section.

6.5.1.3 Ranking reinforces the hierarchy of prestige - future career options

Another unintended consequence of the ranking system is that it appears to reinforce the hierarchical structures within medicine that places academic achievement above all else. A prestige hierarchy exists in medicine in which “active” specialities, such as surgery, are given greater status than “passive” specialities, such as psychiatry.⁴⁴³ These beliefs exist amongst medical students considering their future careers, who tend to believe that hospital specialities are more prestigious than community specialities.^{444,445} Academic struggle, which reduces student self-efficacy, can impact whether students even consider applying to “prestigious” career pathways based on the belief that they are inadequately positioned. The EPM only explains a small degree of variance in postgraduate performance²⁹⁰, so this perceived barrier risks stopping many candidates from considering suitable careers. This may also be a contributing factor to the finding that under-represented groups are overrepresented in the lower deciles¹⁹⁰ and that they are also more likely to pick speciality careers that are deemed less prestigious.⁴¹³ Furthermore, one could argue that ranking does not just reflect this unhealthy hierarchical system but reinforces it: it teaches students to place each other and themselves on a continuum that prioritises academic achievement rather than celebrating each individual’s various skills. This limits both the candidates and the specialities from benefiting from improving the diversity and inclusivity of the workforce.

6.5.2 The EPM reflects and re-enforces differential attainment

This thesis adds to the growing evidence that non-White students, students with disabilities and those from gateway/Access courses are over-represented in the lower deciles and under-represented in the top deciles.^{111,190} Gateway courses increase the proportion of ethnic minority students; students who attended state schools; students who were the first in their family to attend higher education; students from lower socioeconomic groups; and students who live in more deprived areas. Curtis and Smith identified that the lower EPM scores noted in students who attended medical school via a gateway course are less apparent when controlling for prior academic attainment,¹¹¹ indicating a greater academic potential than their secondary educational attainment suggests.¹¹¹ This supports the finding that students from the least well-performing secondary schools tended to perform better than those from high-achieving schools,¹⁰⁸ and that students from state-funded schools outperformed those from privately funded schools.¹⁰⁹ All of these studies rightly point to the great potential of students from under-represented backgrounds

and raise important questions regarding the ramifications of these findings for medical school admissions policies and the need to contextualise secondary school attainment within the context of the school in which it was obtained.^{108,109,111} This could result in more equitable admissions policies in which 'discounted offers' (lower grade offers) are available to students from these backgrounds.^{108,109}

However, what does not seem to have been considered in prior literature is the importance of the findings that the EPM appears to be more reflective of the academic attainment achieved before entry to medical school than the student's academic performance during the course and subsequently, the impact of this on the selection process for foundation jobs. Students from under-represented backgrounds have already overcome disadvantages to gain a place at medical school, but these disadvantages tend to persist during the course. For example, over half of gateway students undertake paid work to support themselves and their dependents during the course.⁴⁴⁶ They are then further penalised with lower relative scores in an application process that is more reflective of levels of educational attainment prior to medical school rather than performance during the course, without accounting for factors contributing to such lower attainment. Rather than celebrating their relative academic achievement whilst at medical school, the application process appears to disadvantage this cohort of students further. This can potentially put them at greater risk of being placed in the lower performance deciles, a major component of the application score for foundation job selection, directly impacting their prospects of obtaining a post at their first choice foundation school.²⁹⁴ Geographical location and proximity to support networks are the primary drivers behind medical students' choices when applying for foundation schools.²⁹² A system that disproportionately negatively impacts under-represented students unfairly places them in less sought-after areas, further away from crucial social support networks such as family and friends.²⁹²

6.5.3 Implications for practice and research

Creating an equal and fair application policy for foundation school training is challenging and unenviable. If the aim is to create a meritocratic system, then what the individual component scores measure and what they are measured against (i.e., what they are predicting) need to be carefully considered. Furthermore, we must reflect on how the system supports dominant sociocultural values and beliefs about knowledge and capability that continue to drive differential attainment. The Modernising Medical Careers program was introduced to improve what was perceived as an unsatisfactory postgraduate job allocation process in 2005 by creating a national

application process. However, when implementing such wide-ranging policies, there is always the potential for unintended consequences. However, the student perspective has been lacking in debates about the appropriateness of the foundation programme application process.

Within the literature that does discuss the foundation selection process, there have been limited suggestions for change. Most authors have called for changes in the distribution of points within the current metrics or the introduction of a national licencing examination for ranking, similar to processes in other European countries.^{50,299,447,448} This is based on the belief that knowledge-based assessments provide more predictive validity for postgraduate examination success than assessments such as the SJT and reduce the inter-school variability of the EPM.^{50,449,450} Replacing SJTs with interviews has also been suggested, although the cost and practical implications may mean this is not feasible.⁴⁵⁰ The national Medical Licencing Assessment (MLA), due to be introduced in 2024, will be sat by students across UK medical schools, and passing it will be a requirement for joining the medical register.⁴⁵¹ However, this aims to reduce the variation in local medical school assessments to set the minimum standard for any qualifying doctor, and there are currently no plans for it to be used by the UKFPO.⁴⁵¹ I would caution against the use of national licencing exam scores as a tool to rank students for the foundation jobs application process without considering several potential consequences:

- 1) This approach would continue to primarily value academic performance in a written assessment as the definition of the 'best' doctors without assessing the other requisite skills required, such as communication and teamwork skills.^{73,452}
- 2) Using future academic performance in similar assessments modalities (e.g., MRCP/MRCS) as the outcome variable in predictive models may bias the findings as it is likely that those students who perform well in one modality of assessment will continue to do so in future assessments in the same modality. The finding that students assessed more frequently at medical school perform better in postgraduate assessments⁴⁵³ suggests that there may be an element of exam technique development that occurs, with a lack of clarity as to whether repeated assessment contributes to a greater degree of 'knowledge'.
- 3) It would be necessary to combine the score with other metrics, as moving to a single high-stakes assessment from multiple assessment measures reduces reliability and is more prone to error.^{452,454}
- 4) This approach does nothing to address the issues with differential attainment seen at medical school. It does not account for the impact of prior educational attainment on performance at medical school or the additional barriers faced by under-represented students who are, therefore, less likely to obtain their chosen work location.

5) If one does believe doctors who score higher in assessments are the 'best' doctors, then this system will continue to send the lowest performing doctors, who are likely to require more support, to the most deprived areas. Deprived areas are more likely to have rota-gaps and a stretched workforce in which there is likely to be less available support. This can negatively impact the level of healthcare provided to patients in communities most in need.

If a foundation school selection process is pursued, it is likely that all metrics will be influenced by structural inequalities that exist before and during the medical course that negatively impact academic performance and thus will always disadvantage students from under-represented backgrounds. This approach would raise important questions, such as: should a compensatory algorithm be included in which students from certain backgrounds obtain scores that account for the disadvantages they have overcome? How would this be implemented fairly? What variables would be counted as forms of disadvantage? This would be a very challenging and complex system to implement and would risk creating divisions within the medical school population leading to reduced cohesion and teamwork.

Does a more radical solution exist? Given that the foundation school application is an allocation process rather than a selection process (because all medical students have to complete foundation training to be registered as medical practitioners),²⁸⁷ one could argue for removing selection criteria entirely. Australia does not use a national ranking system, and students apply for an internship within a State or Territory, with priority being given to those who studied within the State.⁴⁵⁵ This model may be feasible in the UK deanery system in which students continue to work in the deanery attached to their undergraduate medical school. Benefits may include a smoother transition to clinical practice within a deanery newly qualified doctors are familiar with and in which they have already created social connections, which are often a source of informal support. It would also remove the competitive nature of the ranking system and its associated negative consequences and could thereby improve student well-being. An obvious disadvantage would be the limitation for students to move between deaneries, and this system may disproportionately affect IMGs who, if following the Australian model, would be lower down the priority list.⁴⁵⁵ It also risks broadening inequalities, because more prestigious medical schools attract more high-achieving students. Additionally, this type of system does not consider the hospitals that are not associated with medical schools and how they would be able to recruit junior doctors. Moving to a completely choice-based system in which students are allocated randomly to one of their top choices may remove the effects of differential attainment and ranking. This is now being considered and more research into whether this would increase or decrease the percentage of students allocated to one of their top five choices would be necessary prior to considering such a

shift.⁴⁵⁶

Our research contributes to evidence suggesting significant flaws in the current system and adds the student perspective that has not previously been considered. This will hopefully provide a new perspective to the current debate about the appropriateness of the application system, to which solutions and changes must be sought. Further research attempting to understand the experience of newly qualified doctors who have had to move to deaneries that were not desirable to them may identify ways to better support them as individuals and within their communities of practice. It may also identify ways the process influences beliefs and behaviours that impact career decisions, the locations they pursue working in, and their progress in postgraduate examinations.

6.6 Limitations

There were limitations associated with each of the studies conducted in this MD, and those relating to each study have been outlined in greater detail within chapters 4 and 5; they should be considered when interpreting the findings.

The studies were single-institution studies analysing the environment, curriculum, assessments and support structures specific to the institution. Therefore, the results may not be directly applicable to other institutions. However, as noted previously, the curriculum at BSMS matches the commonly used framework across medical schools in the UK in which the first two years focus on basic sciences, shifting to learning in the clinical environment for the last three years. In addition, our cohort demographics match national data closely, and the national alignment of UK medical schools with the GMC 'Outcome for Graduates' document ensures a degree of standardisation regarding curriculum and assessment.⁷³ Therefore, it is likely that the findings can be generalised to other institutions in the UK.

The absence of preadmission data limited the extent of the analyses. This was due to difficulties accessing such data, including prior academic attainment, aptitude scores, socioeconomic demographic data and whether students were widening participation students. However, the influence of these variables has been investigated previously using a national database.^{31,32,40,108,109} With the ongoing accumulation of data in the UK Medical Education Database (UKMED), there are opportunities to pursue national-level analyses of early academic performance when controlling for pre-admission attainment levels.

My use of student placement in the lowest three deciles at the end of the third year as a marker of academic underperformance in my studies may be contentious. As an arbitrary cut-off, it may

have included students who do not consider themselves to be performing poorly academically; some of the participants noted this. Sampling students within the lowest deciles is likely to have influenced the broadly negative attitudes towards the ranking system. It would be interesting to explore if students in the higher deciles shared similar experiences and whether they believed the ranking score accurately reflects their abilities. However, the intention of this study was not to compare and contrast experiences between 'high' and 'low' achievers, an approach some authors have taken.¹⁷⁵ Instead, the aim was to gain an in-depth understanding of how students most negatively affected by the system make sense of their experiences to consider ways of constructing more equitable systems.

Academic difficulty, as defined by relative performance, means that not all students who fall within the lower three deciles perceive themselves as low-performing students. This may protect them from the negative consequences described within the thesis. Students who perceive they are performing well relative to their capability or the time constraints available to study are likely to utilise support systems differently. One of the cited limitations of self-referring support systems is that students considered to be high achievers based on their relative performance compared to peers are more likely to utilise these services due to anxieties related to their studies.¹³³ Future research in which academic difficulty is conceptualised as performance relative to a student's perceived capability is of merit as this subset of students may be at a similar risk of psychological harm. It may also identify a different set of needs to guide more targeted support.

6.7 Reflexivity

Qualitative researchers are encouraged to consider how their own characteristics impact the design of their studies, how data were collected and the interpretation of the findings.⁴⁵⁷ This section identifies the impact I, as the researcher, had on how the thesis was conceptualised, the data collection and the interpretation of the findings.

6.7.1.1 The novice researcher

Before commencing this thesis, I had limited experience conducting quantitative research and no experience conducting qualitative research. I had been frustrated by the limitations of quantitative research in explaining the "why" rather than just the "what", which drove me to use multiple research methods to answer my research question. This required me to upskill in both quantitative and qualitative research methods.

I approached the designing of the thesis from a critical realist position⁴⁵⁸ in which I wanted to investigate whether it is possible to predict students most at risk of academic difficulty and, by exploring their experiences, attempt to understand how medical schools can offer more effective support. In addition, my experience as a medical student who did not excel academically and placed in the lower quartile (deciles replaced quartiles in 2015) without facing outright failure sparked an interest in researching this topic.

Being a medical doctor who has chosen a career in a procedural speciality in which there is a focus on identifying problems and seeking solutions is reflected in how the quantitative design was first conceptualised. Before starting the project, I had a naive positivist belief that a study could be designed to create a scoring system to predict and identify students at risk of academic failure and to whom we could offer early support. Clinical studies in medicine are often aimed at creating predictive scoring systems, and I believed this was translatable to students by categorising them as low, medium and high risk. I believed this would help answer the question of 'how to identify students prior to failure?'. However, my journey throughout this MD has shifted my beliefs, as I have learnt to consider the structural inequalities that exist in society and how they are perpetuated in higher education. What started as a way of exploring the drivers of academic performance from a student perspective drew me to question the reality of meritocracy in systems which afford privilege to some but not others. This has changed the lens through which I have viewed and interpreted the results, but it was not a central component of how I developed the research question when I began.

It would be misleading to state that I had not considered and wanted to reduce inequalities in medical education before starting the MD, as one of the drivers behind this MD was to create a more equitable system. The political environment during the time I undertook the MD was also influential. For example, the murder of George Floyd that sparked the Black Lives Matter movement, and the COVID-19 pandemic increased the awareness of structural inequalities that exacerbated health and other inequalities.^{459,460} I subscribe to the belief that "bracketing" out my preconceptions which are influenced by my previous experiences and the context in which the data were collected, is impossible, so I focused on maintaining an awareness of ways in which they impacted my collection and interpretation of the data, for example by completing field notes at the end of each interview informed by the content guide from Phillipi and Lauderdale³⁶⁶ which were further reflected on in discussions with my supervisor. The ways in which the field notes helped me reflect on and develop my interview techniques and understand how I impacted the data collection and analysis are described in more detail below.

6.7.1.2 Data collection

My lack of experience in qualitative interviewing was a source of great anxiety for me due to fears that this would reduce the quality of the data collection. Therefore, I undertook pilot interviews and interviewing courses to enhance the quality of my interviews and increase my confidence (Chapter 3). In addition, throughout the interview process, I completed field notes, and discussed concerns about my interviewing technique with one of my supervisors (RdV) and colleagues with prior experiences with qualitative interviewing. This helped me adapt and improve the methods I used, such as asking interviewees to pause whilst I made notes of comments that needed further exploration later in the interview.

Creating the interview topic guides was an iterative process partly informed by findings from the broader literature (Chapter 1) and the scoping review (Chapter 2). These identified areas of enquiry including; motivation to study medicine; experiences of the curriculum; teaching; learning; assessment; ranking; failure, support/remediation and the environment at the medical school. Additional areas of discussion were brought to attention during the interviews and added to subsequent topic guides, including the role of academic tutors, the impact of logbooks and how ranking impacted their future career aspirations.

6.7.1.2.1 A doctor amongst aspiring medical students

My characteristics as the interviewer will have impacted how the participants engaged in the interview and the data obtained. One way of attempting to understand how my role impacted the interviews was through the 'wind down' questions that allowed the students to reflect on whether their responses would have differed had I been a more senior member of staff on one end of the spectrum or a fellow student on the other. Several participants commented on the importance that I was a medical doctor who had completed a medical degree (at a different medical school). As such, I was perceived to have shared experiences with the participants. This was evident in some of the responses of the participants. For example, when Jem discussed medics as a small community, she stated, "as you know", referring to this sharing of experiences. In this way, I was perceived to be 'like them', and this afforded a sense of legitimacy (Chapter 5) as an individual whose experiences "were equivalent or reflected" (Paul, chapter 5, section: reflections on the interview process) those of the participants. This, combined with my relative lack of seniority, were reasons cited by participants as enablers of discussions about the course that may have reflected negatively on the institution. However, due to my role as a qualified

doctor, which they are aspiring towards, and as a result of my position as a faculty member, it is possible that the participants would have adapted and tempered some of their negative opinions about the medical school. This was all alluded to by one of the participants (Nigel), who stated that had the interview been undertaken by a fellow student, they would have discussed “all their gripes” about the course, although he was not keen to further his explanation of this. It would be interesting to see how the responses would have differed had the interviews been undertaken by a non-medic who was not initiated into the culture of medicine and thus influenced by the hidden curriculum. It may have been that I did not challenge shared assumptions that are the ‘norm’ within medical culture, which may have provided alternate reflections.

During the interpretation of the data I was also aware that the timing of the interviews may have influenced the data; participants had all managed to persist despite difficulties they had faced along the course, and the passage of time was perceived as necessary in providing opportunities to reflect on their experiences. This undoubtedly impacted how they had made sense of their experiences and the narratives they would have formed, and is likely to have produced more balanced responses. Some participants stated they would not have volunteered for the study had it occurred during a period of academic difficulty.

6.7.1.3 Challenges and learning

There were several significant challenges during the interviewing process. At the outset, I aimed to approach each interview in a standardised manner. I decided to avoid disclosing personal experiences to avoid introducing my pre-structures and preconceptions that could impact the interview and the resulting data. However, during the course of interviewing, it felt misleading to hide why I was researching the topic when directly asked about it during the ‘wind-down’ questions. This was discussed with my supervisor, and a decision was made to remain honest and sincere with the participants should a direct question arise but not to implant my experiences unprompted.

Another challenge was the ability to build rapport and establish a flowing discussion. I found this easy with most participants, who were willing and able to discuss their experiences with limited prompting. However, there were times in which participant reflections led to tangential discussions, and I had to find a balance between exploring potential areas of interest that had yet to be identified in the literature against the want to cover areas of interest the literature had previously identified. When transcribing those interviews, I was aware that I often missed cues in the discussion that could have led to explorations of alternate experiences, but in attempts to

minimise the impact I had on the flow of the participant, I waited for them to finish their responses. However, in doing so, losing the opportunity/forgetting what the cue was to return to. After a discussion with my supervisor, I adopted several strategies to improve my interview technique, for example, noting cues down whilst remaining present and actively listening to the ongoing response before coming back to further questions.

Two of the interviews contrasted with this experience. One participant's responses tended to be direct and limited. I found it challenging to explore the experiences in greater detail; the more I attempted to do so, the more closed the questions became. This stilted the flow of the interview, and I was aware of my discomfort with my interviewing technique that the participant may have picked up. In addition, I was unsure how far to delve into personal experiences that were not clearly linked to the experiences of academic difficulty. This may have reduced the freedom with which the participants discussed their experiences. One of the participants self-identified that they viewed the medical school and research with a cynical lens. I found navigating the interview difficult as I attempted to allow the participant to explore and reflect on their experiences. I tried to do so in a non-judgmental way whilst also challenging certain assumptions and conclusions they had drawn in attempts to gain a better understanding of their experiences.

During transcription and data analysis, it became clear that there were certain misunderstandings and a lack of clarity when the participants discussed academic and psychological support. For some participants, the distinction could have been more apparent, and I realised I needed to explore this in more detail. This made analysing and interpreting their beliefs and behaviours more challenging. In the future, I can stop the interview and clarify points as they arise or make a note to return to them at an appropriate time.

My experience reflected what has been described in Interpretative Phenomenological Analysis (IPA) literature: many preconceptions only became apparent during engagement with the interview data.³³⁹ While I attempted to approach each interview in the same way, it was clear that there were minor changes in my interviewing style. This iterative process allowed me to refine the interview guide and focus of the subsequent interviews to address topics important to the other participants that I had not considered before commencing the study.

6.7.1.4 Interpreting the data

In IPA, researchers are urged to balance the interpretative position they take between the hermeneutics of empathy and the hermeneutics of suspicion.³⁴² A good researcher is described as being able to combine both stances in attempting to understand what it is like for the participant, but also questions, analyses, illuminates and makes sense of their experience.³³⁹

Reflecting on my interpretative approach, my natural tendency was towards a hermeneutics of empathy. I had to work on taking a more critical position in my analysis of the data; I was supported to do this with the help and support of my supervisor (RdV), who suggested several analytical exercises that are described in Chapter 3, such as stepping away from the descriptive codes to create a distance to formulate conceptual titles and comparing and contrasting these with findings from the scoping review (Chapter 2) and broader literature (Chapter 1).

6.8 My personal Journey

On a practical level I believe embarking on this thesis has helped me upskill in both quantitative and qualitative methodology. However, the most profound impact has been how I have come to consider the quest for understanding and acquiring knowledge. Within the context of the thesis I have shifted from considering academic performance based largely on meritocracy to understanding the multiple ways in which situational, dispositional and institutional factors impact students in various ways. I have gained an appreciation of understanding the importance of how people make sense of their experiences, how this impacts how they attribute the causes of their experiences and subsequently how this impacts future behaviours. Associated to this I have gained a greater appreciation of the importance of the language we use as researchers and educators especially when describing student performance. Labelling students risks causing stigmatisation which can have long-term effects on student well-being and sense of worth. Language also relays the assumptions we make about the world and our beliefs of the causes of academic underperformance. Only by reflecting on the language we use can we challenge those assumptions and develop new understandings.

I feel fortunate to have been part of a research group at Southpoint with widely differing ontological positions that has made me reflect and analyse the assumptions I hold. This has helped me consider how dominant cultural codes and practices continue to contribute to the phenomenon of differential attainment and has made me consider new avenues and interests for future research. This is an area of academia I would like to continue to contribute towards both through research and being involved in the practical implementation of processes to provide more equitable experiences in medical education.

7 Conclusion

This thesis has explored the student perspective of their experiences of academic difficulty and has provided numerous insights into how their beliefs shape their behaviours. Academic difficulty, be it overt failure or relative underperformance compared to peers, is accompanied by multiple adverse sequelae that challenge their self-identity and self-worth and contribute to the degradation of their mental well-being. It is often a new experience that is unexpected and for which students are unprepared and lack the tools to navigate. This can lead to the adoption of maladaptive coping strategies, social isolation and a reluctance to access formal support services in fear of highlighting their difficulties. However, failure provides a moment in time that motivates students to reflect on their learning approaches and provides opportunities for behaviour change. This should be harnessed by faculty involved in remediation. The degree to which behaviour change occurs appears to be dictated by the importance students give to the assessment(s) that are failed with multiple failures, failure in assessments that are perceived to be linked to future job roles and failure in summative assessments being most influential.

Students who face academic difficulty tend to find self-analysis challenging and welcome the provision of tools that may help identify their difficulties early for appropriate support to be offered in a timely manner. Learner analytics can play a role in supporting the early identification of 'at-risk' students but must be implemented cautiously, for example, in combination with a longitudinal mentorship system akin to that of a coach whose goal is to optimise student performance. Creating a system such as this, that is available to, and can benefit all students, will also capture the cohort of students who do not fail but continue to persist with inefficient learning practices.

The dual role of the medical school, which students perceive as the gatekeeper to a successful career in medicine but also an intended source of support, is challenging for institutions? to navigate. The student perspective has provided insight into why often well-meaning support structures remain underutilised. Understanding how the students position themselves in relation to the institution is crucial as this dictates how or whether they choose to engage. Whilst the student perspective has identified ways in which support can be improved, institutions may gain more from focusing their attention on improving student engagement with existing support systems and combating the drivers that lead to the development of adversarial relationships between them and students.

The evidence of differential attainment identified in this thesis mirrors prior studies and may be explained by the inequitable experience certain groups of students encounter at medical school. The student narratives repeatedly described the importance of socialised learning on their ability to persist and succeed on the course and identified some barriers to accessing it, including; financial pressures, the presence and impact of mental health difficulties and a lack of sense of belonging. Improving financial support, developing peer-mentorship programmes, improving diversity in faculty representation, developing institute-student partnerships and making mental health services more accessible may help combat this. However, there is a need for institutions to critically reflect on the values and morals they espouse, as well as their dominant cultural norms and in doing so, question what they are asking students to belong to, the impact belonging has on students and how the institution is contributing to differential attainment. Whether students believe they belong to the institution and the learning environment or not influences how they develop social connections with peers as well as the relationships they develop with staff and the institution as a whole, which, as we explained earlier, dictates how they choose to engage.

The thesis has also brought to light the impact the process of ranking medical students has on students and raises concerns about its ongoing use in the foundation jobs allocation system. Students perceive it as an unfair, poor metric of their ability, which does not account for the difficulties they have overcome. It is criticised for lacking standardisation across institutions and being difficult to understand and learn from. This deepens students' distrust towards the medical school, which is perceived to be enforcing an unfair system on them. Ranking is important to students and becomes ingrained in their self-identity, continually signalling their ability in relation to their peers. This contributes to the creation of a competitive learning environment amongst peers, which reduces the likelihood of students sharing resources and working collaboratively; it negatively impacts self-efficacy beliefs and contributes to high-stress levels, which lead to a degradation in mental well-being. In addition, ranking re-enforces differential attainment at medical school with an over-representation of non-white students, those with disabilities and those who attend medical school through gateway courses in the lower deciles. This directly impacts where these students obtain their first jobs. They are more likely to be placed away from support networks and in less desirable geographic locations with the risk of less support and learning opportunities. This is likely to contribute to the reasons differential attainment persists in post-graduate examinations. The findings support calls for the UK Foundation Programme Office (UKFPO) to consider alternative options for future foundation job applications.

8 References

1. UCAS. More people than ever want to be a doctor | Undergraduate. <https://www.ucas.com/corporate/news-and-key-documents/news/more-people-ever-want-be-doctor>. Published 2020.
2. Office for Students. *Medical and Dental Target Intakes*. Office for Students; 2018. <https://www.officeforstudents.org.uk/advice-and-guidance/funding-for-providers/health-education-funding/medical-and-dental-target-intakes/>.
3. Department of Health. *Expanding Undergraduate Medical Education IA No: DH8080 Impact Assessment (IA) Summary: Intervention and Options RPC.*; 2017.
4. Kalet A, Chou CL, Ellaway RH. To fail is human: remediating remediation in medical education. *Perspect Med Educ*. 2017;6(6):418-424. doi:10.1007/s40037-017-0385-6
5. Chou CL, Kalet A, Costa MJ, Cleland J, Winston K. Guidelines: The dos, don'ts and don't knows of remediation in medical education. *Perspect Med Educ*. 2019;8(6):322-338. doi:10.1007/s40037-019-00544-5
6. Foo J, Rivers G, Ilic D, et al. The economic cost of failure in clinical education: a multi-perspective analysis. *Med Educ*. 2017;51(7):740-754. <https://onlinelibrary.wiley.com/doi/full/10.1111/medu.13266>. Accessed August 27, 2020.
7. Guerrasio J, Furfari KA, Rosenthal LD, Nogar CL, Wray KW, Aagaard EM. Failure to fail: The institutional perspective. *Med Teach*. 2014;36(9):799-803. doi:10.3109/0142159X.2014.910295
8. Brazeau CMLR, Shanafelt T, Durning SJ, et al. Distress among matriculating medical students relative to the general population. *Acad Med*. 2014;89(11):1520-1525. doi:<https://dx.doi.org/10.1097/ACM.0000000000000482>
9. Dyrbye LN, Moutier C, Durning SJ, et al. The problems program directors inherit: medical student distress at the time of graduation. *Med Teach*. 2011;33(9):756-758. doi:10.3109/0142159X.2011.577468
10. Whitla DK, Orfield G, Silen W, Teperow C, Howard C, Reede J. Educational benefits of diversity in medical school: a survey of students. *Acad Med*. 2003;78(5):460-466. doi:10.1097/00001888-200305000-00007
11. Saha S, Shipman S. *The Rationale for Diversity in the Health Professions : A Review of the*

- Evidence. *undefined*. 2007.
12. Boelen C, Woollard R. Social accountability: the extra leap to excellence for educational institutions. *Med Teach*. 2011;33(8):614-619. doi:10.3109/0142159x.2011.590248
 13. Angel C, Johnson A. Broadening access to undergraduate medical education. *Br Med J*. 2000;321(7269):1136-1138. doi:10.1136/bmj.321.7269.1136
 14. Cleland JA, Nicholson S, Kelly N, Moffat M. Taking context seriously: Explaining widening access policy enactments in UK medical schools. *Med Educ*. 2015;49(1):25-35. doi:10.1111/medu.12502
 15. Medical Schools Council. *Selecting for Excellence Final Report.*; 2014. <https://www.medschools.ac.uk/media/1203/selecting-for-excellence-final-report.pdf>. Accessed February 3, 2022.
 16. Yates J. When did they leave, and why? A retrospective case study of attrition on the Nottingham undergraduate medical course. *BMC Med Educ*. 2012;12(1):43. doi:10.1186/1472-6920-12-43
 17. Maher BM, Hynes H, Sweeney C, et al. Medical School Attrition-Beyond the Statistics A Ten Year Retrospective Study. *BMC Med Educ*. 2013;13(1):13. doi:10.1186/1472-6920-13-13
 18. Yates J, James D. Predicting the “strugglers”: a case-control study of students at Nottingham University Medical School. *BMJ*. 2006;332(7548):1009-1013. doi:10.1136/bmj.38730.678310.63
 19. O’Neill LD, Wallstedt B, Eika B, Hartvigsen J. Factors associated with dropout in medical education: a literature review. *Med Educ*. 2011;45(5):440-454. doi:10.1111/j.1365-2923.2010.03898.x
 20. Simpson KH, Budd K. Medical student attrition: a 10-year survey in one medical school. *Med Educ*. 1996;30(3):172-178. doi:10.1111/j.1365-2923.1996.tb00739.x
 21. Cleland J, Leggett H, Sandars J, Costa MJ, Patel R, Moffat M. The remediation challenge: theoretical and methodological insights from a systematic review. *Med Educ*. 2013;47(3):242-251. doi:10.1111/medu.12052
 22. McManus IC, Woolf K, Dacre J, Paice E, Dewberry C. The Academic Backbone: Longitudinal continuities in educational achievement from secondary school and medical school to MRCP(UK) and the specialist register in UK medical students and doctors. *BMC Med*.

- 2013;11(1):242. doi:10.1186/1741-7015-11-242
23. Papadakis MA, Hodgson CS, Teherani A, Kohatsu ND. Unprofessional Behavior in Medical School Is Associated with Subsequent Disciplinary Action by a State Medical Board. *Acad Med*. 2004;79(3):244-249. doi:10.1097/00001888-200403000-00011
 24. Yates J, James D. Risk factors at medical school for subsequent professional misconduct: multicentre retrospective case-control study. *BMJ*. 2010;340(apr27 1):c2040-c2040. doi:10.1136/bmj.c2040
 25. Papadakis MA, Teherani A, Banach MA, et al. Disciplinary Action by Medical Boards and Prior Behavior in Medical School. *N Engl J Med*. 2005;353(25):2673-2682. doi:10.1056/NEJMsa052596
 26. Carroll D, Ng E, Birch D. Retention and progression of postgraduate business students: an Australian perspective. *Open Learn J Open, Distance e-Learning*. 2009;24(3):197-209. doi:10.1080/02680510903201599
 27. Bowles T V., Brindle KA. Identifying facilitating factors and barriers to improving student retention rates in tertiary teaching courses: a systematic review. *High Educ Res Dev*. 2017;36(5):903-919. doi:10.1080/07294360.2016.1264927
 28. Bore M, Munro D, Powis D. A comprehensive model for the selection of medical students. *Med Teach*. 2009;31(12):1066-1072. doi:10.3109/01421590903095510
 29. Van Der Vleuten CPM. *The Assessment of Professional Competence: Developments, Research and Practical Implications*. Vol 1.; 1996.
 30. Wainer H, Sireci SG. Item and Test Bias. *Encycl Soc Meas*. January 2004:365-371. doi:10.1016/B0-12-369398-5/00446-1
 31. Bridgeman B, Pollack J, Burton N. UNDERSTANDING WHAT SAT REASONING TEST™ SCORES ADD TO HIGH SCHOOL GRADES: A STRAIGHTFORWARD APPROACH. *ETS Res Rep Ser*. 2004;2004(2):i-20. doi:10.1002/j.2333-8504.2004.tb01967.x
 32. Richardson M, Abraham C, Bond R. Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychol Bull*. 2012;138(2):353-387. doi:10.1037/a0026838
 33. McManus IC. A-level grades and medical school admission. *Br Med J (Clin Res Ed)*. 1982;284(6329):1654-1656. doi:10.1136/bmj.284.6329.1654

34. McManus IC, Richards P. Audit of admission to medical school: I - Acceptances and rejects. *Br Med J*. 1984;289(6453):1201-1204. doi:10.1136/bmj.289.6453.1201
35. Medical Schools Council. Entry requirements. <https://www.medschools.ac.uk/studying-medicine/making-an-application/entry-requirements>. Accessed February 4, 2022.
36. Chowdhury F. Grade Inflation: Causes, Consequences and Cure. *J Educ Learn*. 2018;7(6):86. doi:10.5539/jel.v7n6p86
37. Mcmanus IC, Richards P. Prospective survey of performance of medical students during preclinical years. *Br Med J (Clin Res Ed)*. 1986;293(6539):124-127. doi:10.1136/bmj.293.6539.124
38. Tomlinson RWS, Clack GB, Pettingal KW, Anderson J, Ryan KC. The relative role of 'A' level chemistry, physics and biology in the medical course. *Med Educ*. 1977;11(2):103-108. doi:10.1111/j.1365-2923.1977.tb00569.x
39. Montague W, Odds FC. Academic selection criteria and subsequent performance. *Med Educ*. 1990;24(2):151-157. doi:10.1111/j.1365-2923.1990.tb02514.x
40. McManus IC, Dewberry C, Nicholson S, Al. E. The UKCAT-12 study: educational attainment, aptitude test performance, demographic and socio-economic contextual factors as predictors of first year outcome in a cross-sectional collaborative study of 12 UK medical schools. *BMC Med Educ*. 2013;11:244.
41. Kreiter CD, Kreiter Y. A validity generalization perspective on the ability of undergraduate GPA and the medical college admission test to predict important outcomes. *Teach Learn Med*. 2007;19(2):95-100. doi:10.1080/10401330701332094
42. Ferguson E, James D, Madeley L. Factors associated with success in medical school: Systematic review of the literature. *Br Med J*. 2002;324(7343):952-957. doi:10.1136/bmj.324.7343.952
43. McManus IC, Smithers E, Partridge P, Keeling A, Fleming PR. A levels and intelligence as predictors of medical careers in UK doctors: 20 Year prospective study. *Br Med J*. 2003;327(7407):139-142. doi:10.1136/bmj.327.7407.139
44. Lowe M, Kerridge I, Bore M, et al. Is it possible to assess the "ethics" of medical school applicants? *J Med Ethics*. 2001;27(6):404-408. <http://search.ebscohost.com/login.aspx?direct=true&db=jlh&AN=106928249&site=ehost-live&scope=site>.

45. Tyler W. A. H. Halsey, A. F. Heath and J. M. Ridge, *Origins and Destinations: Family, Class and Education in Modern Britain*, Oxford University Press. Vol 10. Cambridge University Press (CUP); 1981:115-118. doi:10.1017/s0047279400010400
46. Powis D, Hamilton J, McManus IC. Widening access by changing the criteria for selecting medical students. *Teach Teach Educ.* 2007;23(8):1235-1245. doi:10.1016/j.tate.2007.06.001
47. Emery JL. *Numbers Achieving 3 A Grades in Specific A-Level Combinations by School Type and LEA Statistics Report Series No. 9.*; 2009.
48. Powis D, James D, Ferguson E. Demographic and socio-economic associations with academic attainment (UCAS tariff scores) in applicants to medical school. *Med Educ.* 2007;41(3):242-249. doi:10.1111/j.1365-2929.2006.02683.x
49. AAMC. Using MCAT® Data in 2022 Medical Student Selection. 2021. www.aamc.org/mcat. Accessed March 16, 2022.
50. Harris BHL, Walsh JL, Lammy S. UK medical selection: Lottery or meritocracy? *Clin Med J R Coll Physicians London.* 2015;15(1):40-46. doi:10.7861/clinmedicine.15-1-40
51. Koenig JA, Sireci SG, Wiley A. Evaluating the predictive validity of MCAT scores across diverse applicant groups. *Acad Med.* 1998;73(10):1095-1106. doi:10.1097/00001888-199810000-00021
52. Mitchell K, Haynes R, Koenig J. Assessing the validity of the updated medical college admission test. *Acad Med.* 1994;69(5):394-401. doi:10.1097/00001888-199405000-00017
53. Salvatori P. *Reliability and Validity of Admissions Tools Used to Select Students for the Health Professions.* Vol 6. Adv Health Sci Educ Theory Pract; 2001:159-175. doi:10.1023/A:1011489618208
54. Donnon T, Paolucci EO, Violato C. The Predictive Validity of the MCAT for Medical School Performance and Medical Board Licensing Examinations: A Meta-Analysis of the Published Research. *Acad Med.* 2007;82(1):100-106. doi:10.1097/01.ACM.0000249878.25186.b7
55. Julian ER. *Validity of the Medical College Admission Test for Predicting Medical School Performance.*
https://journals.lww.com/academicmedicine/Fulltext/2005/10000/How_Medical_Students_and_Residents_Describe_the.10.aspx. Accessed August 3, 2020.
56. Lynch B, Mackenzie R, Dowell J, Cleland J, Prescott G. Does the UKCAT predict Year 1

- performance in medical school? *Med Educ*. 2009;43(12):1203-1209. doi:10.1111/j.1365-2923.2009.03535.x
57. Yates J, James D. The UK clinical aptitude test and clinical course performance at Nottingham: A prospective cohort study. *BMC Med Educ*. 2013;13(1). doi:10.1186/1472-6920-13-32
58. Sartania N, McClure JD, Sweeting H, Browitt A. Predictive power of UKCAT and other pre-admission measures for performance in a medical school in Glasgow: A cohort study. *BMC Med Educ*. 2014;14(1):116. doi:10.1186/1472-6920-14-116
59. Tiffin PA, Mwandigha LM, Paton LW, et al. Predictive validity of the UKCAT for medical school undergraduate performance: A national prospective cohort study. *BMC Med*. 2016;14(1):140. doi:10.1186/s12916-016-0682-7
60. Wright SR, Bradley PM. Has the UK Clinical Aptitude Test improved medical student selection? *Med Educ*. 2010;44(11):1069-1076. doi:10.1111/j.1365-2923.2010.03792.x
61. Tiffin PA, Dowell JS, McLachlan JC. Widening access to UK medical education for under-represented socioeconomic groups: Modelling the impact of the UKCAT in the 2009 cohort. *BMJ*. 2012;344(7853). doi:10.1136/bmj.e1805
62. Emery JL, Bell JF. The predictive validity of the BioMedical Admissions Test for pre-clinical examination performance. *Med Educ*. 2009;43(6):557-564. doi:10.1111/j.1365-2923.2009.03367.x
63. Emery JL, Bell JF, Vidal Rodeiro CL. The BioMedical admissions test for medical student selection: Issues of fairness and bias. *Med Teach*. 2011;33(1):62-71. doi:10.3109/0142159X.2010.528811
64. McManus IC, Ferguson E, Wakeford R, Powis D, James D. Predictive validity of the Biomedical Admissions Test: An evaluation and case study. *Med Teach*. 2011;33(1):53-57. doi:10.3109/0142159X.2010.525267
65. McManus IC, Woolf K, Dacre J. The educational background and qualifications of UK medical students from ethnic minorities. *BMC Med Educ*. 2008;8. doi:10.1186/1472-6920-8-21
66. Groves MA, Gordon J, Ryan G. Entry tests for graduate medical programs: is it time to re-think? *Med J Aust*. 2007;186(3):120-123. doi:10.5694/j.1326-5377.2007.tb00833.x
67. Cassidy J. UKCAT among the pigeons. *BMJ*. 2008;336(7646):691-692. doi:10.1136/bmj.39519.621111.59

68. Albanese MA, Snow MH, Skochelak SE, Huggett KN, Farrell PM. Assessing personal qualities in medical school admissions. *Acad Med*. 2003;78(3):313-321. doi:10.1097/00001888-200303000-00016
69. Price PB, Lewis EG, Loughmiller GC, Nelson DE, Murray SL, Taylor CW. Attributes of a good practicing physician. *Acad Med*. 1971;46(3):229-237. doi:10.1097/00001888-197103000-00007
70. Bendapudi N, Berry L, Frey K, ... JP-MC, 2006 undefined. Patients' perspectives on ideal physician behaviors. *Elsevier*.
<https://www.sciencedirect.com/science/article/pii/S0025619611614638>. Accessed July 30, 2020.
71. Hurwitz S, Kelly B, Powis D, Smyth R, Lewin T. The desirable qualities of future doctors – A study of medical student perceptions. *Med Teach*. 2013;35(7):e1332-e1339. doi:10.3109/0142159X.2013.770130
72. Maudsley G, Williams EMI, Taylor DCM. Junior medical students' notions of a "good doctor" and related expectations: A mixed methods study. *Med Educ*. 2007;41(5):476-486. doi:10.1111/j.1365-2929.2007.02729.x
73. GMC. Outcomes for graduates - GMC. <https://www.gmc-uk.org/education/standards-guidance-and-curricula/standards-and-outcomes/outcomes-for-graduates/outcomes-for-graduates>. Accessed July 30, 2020.
74. GMC. Outcomes for graduates - Supplementary guidance for medical schools - GMC. <https://www.gmc-uk.org/education/standards-guidance-and-curricula/standards-and-outcomes/outcomes-for-graduates/outcomes-for-graduates---supplementary-guidance-for-medical-schools>. Accessed July 30, 2020.
75. Murden R, Galloway GM, Reid JC, Colwill JM. Academic and personal predictors of clinical success in medical school. *J Med Educ*. 1978;53(9):711-719. doi:10.1097/00001888-197809000-00001
76. Powis DA, Neame RLB, Bristow T, Murphy LB. The objective structured interview for medical student selection. *Br Med J (Clin Res Ed)*. 1988;296(6624):765-768. doi:10.1136/bmj.296.6624.765
77. Collins JP, White GR, Petre KJ, Willoughby EW. A structured panel interview and group exercise in the selection of medical students. *Med Educ*. 1995;29(5):332-336.

- doi:10.1111/j.1365-2923.1995.tb00021.x
78. Meredith KE, Dunlap MR, Baker HH. Subjective and objective admissions factors as predictors of clinical clerkship performance. *J Med Educ.* 1982;57(10):743-751. doi:10.1097/00001888-198210000-00002
 79. Taylor TC. The interview: One more life? *Acad Med.* 1990;65(3):177-178. doi:10.1097/00001888-199003000-00009
 80. Lambe P, Bristow D. Medical Teacher What are the most important non-academic attributes of good doctors? A Delphi survey of clinicians What are the most important non-academic attributes of good doctors? A Delphi survey of clinicians. *Taylor Fr.* 2010;32(8). doi:10.3109/0142159X.2010.490603
 81. Edwards JC, Johnson EK, Molidor JB. The interview in the admission process. *Acad Med.* 1990;65(3):167-177. doi:10.1097/00001888-199003000-00008
 82. Nowacek GA, Bailey BA, Sturgill BC. Influence of the interview on the evaluation of applicants to medical school. *Acad Med.* 1996;71(10):1093-1095. doi:10.1097/00001888-199610000-00017
 83. Powis D. How to do it? Select medical students. *BMJ.* 1998;317(7166):1149. doi:10.1136/bmj.317.7166.1149
 84. Eva KW, Reiter HI, Trinh K, Wasi P, Rosenfeld J, Norman GR. Predictive validity of the multiple mini-interview for selecting medical trainees. *Med Educ.* 2009;43(8):767-775. doi:10.1111/j.1365-2923.2009.03407.x
 85. Turnbull J, Danoff D, Norman G. Content specificity and oral certification examinations. *Med Educ.* 1996;30(1):56-59. doi:10.1111/j.1365-2923.1996.tb00718.x
 86. Eva KW, Rosenfeld J, Reiter HI, Norman GR. *An Admissions OSCE: The Multiple Mini-Interview.* Vol 38. *Med Educ;* 2004:314-326. doi:10.1046/j.1365-2923.2004.01776.x
 87. Pau A, Jeevaratnam K, Chen YS, et al. *The Multiple Mini-Interview (MMI) for Student Selection in Health Professions Training-A Systematic Review.* Vol 35.; 2013:1027-1041. doi:10.3109/0142159X.2013.829912
 88. Brownell K, Lockyer J, Collin T, Lemay JF. Introduction of the multiple mini interview into the admissions process at the University of Calgary: Acceptability and feasibility. *Med Teach.* 2007;29(4):394-396. doi:10.1080/01421590701311713

89. Roberts C, Walton M, Rothnie I, et al. Factors affecting the utility of the multiple mini-interview in selecting candidates for graduate-entry medical school. *Med Educ*. 2008;42(4):396-404. doi:10.1111/j.1365-2923.2008.03018.x
90. Lemay JF, Lockyer JM, Collin VT, Brownell AKW. Assessment of non-cognitive traits through the admissions multiple mini-interview. *Med Educ*. 2007;41(6):573-579. doi:10.1111/j.1365-2923.2007.02767.x
91. Dore KL, Kreuger S, Ladhani M, et al. The reliability and acceptability of the multiple mini-interview as a selection instrument for postgraduate admissions. *Acad Med*. 2010;85(10 SUPPL.). doi:10.1097/ACM.0b013e3181ed442b
92. Reiter HI, Eva KW, Rosenfeld J, Norman GR. Multiple mini-interviews predict clerkship and licensing examination performance. *Med Educ*. 2007;41(4):378-384. doi:10.1111/j.1365-2929.2007.02709.x
93. Kirchner GL, Stone RG, Holm MB. Use of admission criteria to predict performance of students in an entry-level master's program on fieldwork placements and in academic courses. *Occup Ther Heal Care*. 2001;13(1):1-10. doi:10.1080/j003v13n01_01
94. Standridge J, Boggs K, care KM-R, 1997 undefined. Evaluation of the health occupations aptitude examination. *pascal-francis.inist.fr*. <https://pascal-francis.inist.fr/vibad/index.php?action=getRecordDetail&idt=2852890>. Accessed August 6, 2020.
95. Ferguson E, Sanders A, O'Hehir F, James D. Predictive validity of personal statements and the role of the five-factor model of personality in relation to medical training. *J Occup Organ Psychol*. 2000;73(3):321-344. doi:10.1348/096317900167056
96. Ross CA, Leichner P. Criteria for selecting residents: A reassessment. *Can J Psychiatry*. 1984;29(8):681-686. doi:10.1177/070674378402900809
97. Dirschl D, Medicine GA-A, 2000 undefined. Reliability in evaluating letters of recommendation. *journals.lww.com*. https://journals.lww.com/academicmedicine/Fulltext/2000/10000/Reliability_in_Evaluating_Letters_of.22.aspx. Accessed August 6, 2020.
98. Kumwenda B, Dowell J, Husbands A. Is embellishing UCAS personal statements accepted practice in applications to medicine and dentistry? *Med Teach*. 2013;35(7):599-603. doi:10.3109/0142159X.2013.798402

99. Powis D. Selecting medical students: An unresolved challenge. *Med Teach*. 2015;37(3):252-260. doi:10.3109/0142159X.2014.993600
100. Siu E, Reiter HI. Overview: What's worked and what hasn't as a guide towards predictive Admissions tool development. *Adv Heal Sci Educ*. 2009;14(5):759-775. doi:10.1007/s10459-009-9160-8
101. Behling O. Employee selection: Will intelligence and conscientiousness do the job? *Acad Manag Exec*. 1998;12(1):77-86. doi:10.5465/ame.1998.254980
102. Ting SR. Estimating academic success in the 1st year of college for specially admitted White students: A model combining cognitive and psychosocial predictors. *J Coll Stud Dev*. 1997;38:401-409. <https://psycnet.apa.org/record/1997-06050-003>. Accessed August 6, 2020.
103. Steven K, Dowell J, Jackson C, Guthrie B. Fair access to medicine? Retrospective analysis of UK medical schools application data 2009-2012 using three measures of socioeconomic status. *BMC Med Educ*. 2016;16(1):11. doi:10.1186/s12909-016-0536-1
104. Seyan K, Greenhalgh T, Dorling D. The standardised admission ratio for measuring widening participation in medical schools: Analysis of UK medical school admissions by ethnicity, socioeconomic status, and sex. *Br Med J*. 2004;328(7455):1545-1546. doi:10.1136/bmj.328.7455.1545
105. McManus IC, Esmail A, Demetriou M. Factors affecting likelihood of applicants being offered a place in medical schools in the United Kingdom in 1996 and 1997: Retrospective study. *Br Med J*. 1998;317(7166):1111-1117. doi:10.1136/bmj.317.7166.1111
106. BSMS. Widening participation to medicine - BSMS. <https://www.bsms.ac.uk/about/info-for-schools-teachers-parents/widening-participation-to-medicine.aspx>. Accessed July 28, 2020.
107. Alexander P, Maria G. Understanding Gateway to Medicine Programmes. 2021. doi:10.1111/tct.13368
108. Mwandigha LM, Tiffin PA, Paton LW, Kasim AS, Böhnke JR. What is the effect of secondary (high) schooling on subsequent medical school performance? A national, UK-based, cohort study. *BMJ Open*. 2018;8(5):e020291. doi:10.1136/bmjopen-2017-020291
109. Kumwenda B, Cleland JA, Walker K, Lee AJ, Greatrix R. The relationship between school type and academic performance at medical school: A national, multi-cohort study. *BMJ Open*. 2017;7(8). doi:10.1136/bmjopen-2017-016291

110. Nagengast B, Marsh HW. Big Fish in Little Ponds Aspire More: Mediation and Cross-Cultural Generalizability of School-Average Ability Effects on Self-Concept and Career Aspirations in Science. *J Educ Psychol*. 2012. doi:10.1037/a0027697
111. Curtis S, Smith D. A comparison of undergraduate outcomes for students from gateway courses and standard entry medicine courses. *BMC Med Educ*. 2020;20(1):4. doi:10.1186/s12909-019-1918-y
112. Medical Schools Council. *Selection Alliance 2019 Report An Update on the Medical Schools Council's Work in Selection and Widening Participation*. www.medschools.ac.uk. Accessed July 28, 2020.
113. Garlick PB, Brown G. Widening participation in medicine. *BMJ*. 2008;336(7653):1111-1113. doi:10.1136/bmj.39508.606157.be
114. Curtis S, Blundell C, Platz C, Turner L. Successfully widening access to medicine. Part 2: Curriculum design and student progression. *J R Soc Med*. 2014;107(10):393-397. doi:10.1177/0141076814538787
115. Fyfe M V, Kumar S, Maini A, Horsburgh J, Golding B. Widening participation: moving from diversity to inclusion Molly V Fyfe senior teaching fellow. doi:10.1136/bmj.m420
116. Tinto V. Dropout from Higher Education: A Theoretical Synthesis of Recent Research. *Rev Educ Res*. 1975;45(1). <http://journals.sagepub.com/doi/10.3102/00346543045001089>. Accessed February 17, 2021.
117. Bean JP, Metzner BS. A Conceptual Model of Nontraditional Undergraduate Student Attrition. *Rev Educ Res*. 1985;55(4):485-540. doi:10.3102/00346543055004485
118. Elkins SA, Braxton JM, James GW. Tinto's separation stage and its influence on first-semester college student persistence. *Res High Educ*. 2000;41(2):251-268. doi:10.1023/A:1007099306216
119. Bandura A. Self-efficacy: Toward a Unifying Theory of Behavioural Change. *Psychol Rev*. 1977;84(2):191-215. https://educational-innovation.sydney.edu.au/news/pdfs/Bandura_1977.pdf. Accessed February 16, 2021.
120. Poropat AE. A Meta-Analysis of the Five-Factor Model of Personality and Academic Performance. *Psychol Bull*. 2009;135(2):322-338. doi:10.1037/a0014996
121. Beswick G, Rothblum ED, Mann L. Psychological antecedents of student procrastination. *Aust*

- Psychol.* 1988;23(2):207-217. doi:10.1080/00050068808255605
122. Eccles JS, Wigfield A. Motivational Beliefs, Values, and Goals. *Annu Rev Psychol.* 2002;53(1):109-132. doi:10.1146/annurev.psych.53.100901.135153
 123. Ryan RM, Deci EL. *Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being Self-Determination Theory.* Ryan; 1985.
 124. Covington M V., Müeller KJ. Intrinsic Versus Extrinsic Motivation: An Approach/Avoidance Reformulation. *Educ Psychol Rev.* 2001;13(2):157-176. doi:10.1023/A:1009009219144
 125. Rotter JB. Generalized expectancies for internal versus external control of reinforcement. *Psychol Monogr.* 1966;80(1):1-28. doi:10.1037/h0092976
 126. Bandura A, Freeman W, Lightsey R. Self-efficacy: The exercise of control. 1999. <https://connect.springerpub.com/content/sgrjcp/13/2/158.full.pdf>. Accessed February 16, 2021.
 127. Robbins SB, Le H, Davis D, Lauver K, Langley R, Carlstrom A. Do Psychosocial and Study Skill Factors Predict College Outcomes? A Meta-Analysis. *Psychol Bull.* 2004;130(2):261-288. doi:10.1037/0033-2909.130.2.261
 128. Zimmerman BJ. Investigating Self-Regulation and Motivation: Historical Background, Methodological Developments, and Future Prospects: <http://dx.doi.org/103102/0002831207312909>. 2008;45(1):166-183. doi:10.3102/0002831207312909
 129. Zimmerman BJ, Campillo M. Motivating self-regulated problem solvers. *Psychol Probl Solving.* January 2003:233-262. doi:10.1017/CBO9780511615771.009
 130. Biggs. Student Approaches to Learning and Studying. Research Monograph. *Aust Educ Res Dev.* 1987:153. <https://eric.ed.gov/?id=ED308201>. Accessed February 17, 2021.
 131. Entwistle N, Hanley M, Hounsell D. Identifying distinctive approaches to studying. *High Educ.* 1979;8(4):365-380. doi:10.1007/BF01680525
 132. Marton F, Saljo R. On Qualitative Differences in Learning: Outcome and Process. *Br J Educ Psychol.* 1976;46(1):4-11. doi:10.1111/j.2044-8279.1976.tb02980.x
 133. Bennion LD, Durning SJ, LaRochelle J, et al. Untying the Gordian knot: remediation problems in medical schools that need remediation. *BMC Med Educ.* 2018;18(1):120. doi:10.1186/s12909-018-1219-x

134. Yellin PB. Learning Differences and Medical Education. *Remediat Med Educ A Mid-Course Correct*. January 2014;157-171. doi:10.1007/978-1-4614-9025-8_9
135. Mcloughlin C. Characteristics of Students Failing Medical Education: An Essay of Reflections. *Med Educ Online*. 2009;14.
136. Winston KA, Van der Vleuten CPM, Scherpbier AJJA. An investigation into the design and effectiveness of a mandatory cognitive skills programme for at-risk medical students. *Med Teach*. 2010;32(3):236-243. doi:10.3109/01421590903197035
137. Paul G, Hinman G, Dottl S, Passon J. Academic Development: A Survey of Academic Difficulties Experienced by Medical Students and Support Services Provided. *Teach Learn Med*. 2009;21(3):254-260. doi:10.1080/10401330903021041
138. Pintrich PR. A conceptual framework for assessing motivation and self-regulated learning in college students. *Educ Psychol Rev*. 2004;16(4):385-407. doi:10.1007/s10648-004-0006-x
139. Berkhout JJ, Helmich E, Teunissen PW, et al. How clinical medical students perceive others to influence their self-regulated learning. *Med Educ*. 2017;51(3):269-279. doi:10.1111/medu.13131
140. Atherley A, Dolmans D, Hu W, et al. Beyond the struggles: a scoping review on the transition to undergraduate clinical training. *Med Educ*. 2019;53(6):559-570. doi:https://dx.doi.org/10.1111/medu.13883
141. Nixon LJ, Gladding SP, Duffy BL. Describing Failure in a Clinical Clerkship: Implications for Identification, Assessment and Remediation for Struggling Learners. *J Gen Intern Med*. <http://link.springer.com/10.1007/s11606-016-3758-3>. Accessed August 10, 2021.
142. Mavis BE, Wagner DP, Henry RC, et al. Documenting clinical performance problems among medical students: feedback for learner remediation and curriculum enhancement. *Med Educ Online*. 2013;18(1):20598. /pmc/articles/PMC3724197/. Accessed August 10, 2021.
143. Acheson AG. Do male medical students face prejudice? [21]. *Lancet*. 1997;350(9082):964. doi:10.1016/S0140-6736(05)63312-0
144. McManus IC, Richards P, Winder BC, Sproston KA. Final examination performance of medical students from ethnic minorities. *Med Educ*. 1996;30(3):195-200. doi:10.1111/j.1365-2923.1996.tb00742.x
145. Haq I, Higham J, Morris R, Dacre J. Effect of ethnicity and gender on performance in

- undergraduate medical examinations. 2005;39(11):1126-1128. doi:10.1111/j.1365-2929.2005.02319.x
146. Dewhurst NG, McManus C, Mollon J, Dacre JE, Vale AJ. Performance in the MRCP(UK) examination 2003-4: Analysis of pass rates of UK graduates in relation to self-declared ethnicity and gender. *BMC Med.* 2007;5. doi:10.1186/1741-7015-5-8
147. Rothman A, Cohen R, Ross J, ... PP-... medicine: journal of the, 1995 undefined. Station gender bias in a multiple-station test of clinical skills. *europemc.org*. <https://europemc.org/article/med/7826443>. Accessed August 3, 2020.
148. Zanten M Van, Boulet J, Medicine DM-A, 2003 undefined. Correlates of performance of the ECFMG Clinical Skills Assessment: influences of candidate characteristics on performance. *journals.lww.com*. https://journals.lww.com/academicmedicine/Fulltext/2003/10001/Correlates_of_Performance_of_the_ECFMG_Clinical.23.aspx. Accessed August 3, 2020.
149. Wisikin CMD, Allan TF, Skelton JR. Gender as a variable in the assessment of final year degree-level communication skills. *Med Educ.* 2004;38(2):129-137. doi:10.1111/j.1365-2923.2004.01746.x
150. Lumb AB, Vail A. Comparison of academic, application form and social factors in predicting early performance on the medical course. *Med Educ.* 2004;38(9):1002-1005. doi:10.1111/j.1365-2929.2004.01912.x
151. Bennion LD, Torre D, Durning SJ, et al. Early identification of struggling learners: using prematriculation and early academic performance data. *Perspect Med Educ.* September 2019. doi:10.1007/s40037-019-00539-2
152. Cleland JA, Milne A, Sinclair H, Lee AJ. Cohort study on predicting grades: is performance on early MBChB assessments predictive of later undergraduate grades? *Med Educ.* 2008;42:676-683. doi:10.1111/j.1365-2923.2008.03037.x
153. Krupat E, Pelletier SR, Dienstag JL. Academic Performance on First-Year Medical School Exams: How Well Does It Predict Later Performance on Knowledge-Based and Clinical Assessments? *Teach Learn Med.* 2017;29(2):181-187. doi:10.1080/10401334.2016.1259109
154. Gray C, Toms N. A holistic remediation intervention for struggling undergraduate medical students affords sustained Progress Test performance recovery. *MedEdPublish.* 2018;7(3). doi:10.15694/MEP.2018.0000210.1

155. LeBlanc T. Early evidence of unprofessional behavior found in medical student records. *Virtual Mentor*. 2007;9(4):300-304. doi:10.1001/virtualmentor.2007.9.4.jdsc1-0704
156. Kirk LM. Professionalism in Medicine: Definitions and Considerations for Teaching. *Baylor Univ Med Cent Proc*. 2007;20(1):13-16. doi:10.1080/08998280.2007.11928225
157. Rosenstein AH. The quality and economic impact of disruptive behaviors on clinical outcomes of patient care. *Am J Med Qual*. 2011;26(5):372-379. doi:10.1177/1062860611400592
158. Rosenstein AH. Physician disruptive behaviors: Five year progress report. *World J Clin Cases*. 2015;3(11):930. doi:10.12998/wjcc.v3.i11.930
159. Hickson GB, Federspiel CF, Pichert JW, Miller CS, Gauld-Jaeger J, Bost P. Patient complaints and malpractice risk. *J Am Med Assoc*. 2002;287(22):2951-2957. doi:10.1001/jama.287.22.2951
160. GMC. *Fitness to Practise Statistics 2018*. https://www.gmc-uk.org/-/media/documents/fitness-to-practise-statistics-report-2018_pdf-80514861.pdf. Accessed July 29, 2020.
161. Barnhoorn PC, van Mook WNKA. Professionalism or professional behaviour: No reason to choose between the two. *Med Educ*. 2015;49(7):740. doi:10.1111/medu.12650
162. Ginsburg S, Regehr G, Lingard L. Basing the evaluation of professionalism on observable behaviors: A cautionary tale. In: *Academic Medicine*. Vol 79. Hanley and Belfus Inc.; 2004. doi:10.1097/00001888-200410001-00001
163. Rees CE, Knight L V. Viewpoint: The trouble with assessing students' professionalism: Theoretical insights from sociocognitive psychology. *Acad Med*. 2007;82(1):46-50. doi:10.1097/01.ACM.0000249931.85609.05
164. GMC. Good Medical practice, Domain 1 - Knowledge skills and performance - GMC. <https://www.gmc-uk.org/ethical-guidance/ethical-guidance-for-doctors/good-medical-practice/domain-1---knowledge-skills-and-performance>. Accessed August 10, 2020.
165. RCP, www.rcplondon.ac.uk. *Medical Professionalism in a Changing World The Royal College of Physicians of London*.; 2005. www.rcplondon.ac.uk. Accessed August 10, 2020.
166. RCP. Advancing medical professionalism | RCP London. <https://www.rcplondon.ac.uk/projects/outputs/advancing-medical-professionalism>. Accessed August 10, 2020.

167. Holden MD, Buck E, Luk J, et al. Professional identity formation: creating a longitudinal framework through TIME (Transformation in Medical Education). *Acad Med*. 2015;90(6):761-767. doi:10.1097/ACM.0000000000000719
168. Cruess RL, Cruess SR, Boudreau JD, Snell L, Steinert Y. Reframing medical education to support professional identity formation. *Acad Med*. 2014;89(11):1446-1451. doi:10.1097/ACM.0000000000000427
169. Teherani A, Hodgson CS, Banach M, Papadakis MA. Domains of unprofessional behavior during medical school associated with future disciplinary action by a state medical board. *Acad Med*. 2005;80(10 SUPPL.). doi:10.1097/00001888-200510001-00008
170. Stern DT, Papadakis M. The developing physician - Becoming a professional. Cox M, Irby DM, eds. *N Engl J Med*. 2006;355(17):1794-1799. doi:10.1056/NEJMra054783
171. Bartlett J, Fowler K. Beyond the curriculum: A cross-sectional study of medical student psychological distress, and health care needs, practices and barriers. *Soc Psychiatry Psychiatr Epidemiol*. 2020;55(9):1215-1221. doi:10.1007/s00127-019-01771-1
172. Benbassat J, Baumal R, Chan S, et al. Sources of distress during medical training and clinical practice: Suggestions for reducing their impact. *Med Teach*. 2011;33(6):486-490. doi:http://dx.doi.org/10.3109/0142159X.2010.531156
173. Patel RS, Tarrant C, Bonas S, Shaw RL. Medical students' personal experience of high-stakes failure: case studies using interpretative phenomenological analysis. *BMC Med Educ*. 2015;15(1):86. doi:10.1186/s12909-015-0371-9
174. Patel R, Tarrant C, Bonas S, Yates J, Sandars J. The struggling student: a thematic analysis from the self-regulated learning perspective. *Med Educ*. 2015;49(4):417-426. doi:10.1111/medu.12651
175. Todres M, Tsimtsiou Z, Sidhu K, et al. Medical students' perceptions of the factors influencing their academic performance: an exploratory interview study with high-achieving and re-sitting medical students. *Med Teach*. 2012;34(5):e325-331. doi:http://dx.doi.org/10.3109/0142159X.2012.668626
176. Elzubeir MA, Elzubeir KE, Magzoub ME. Stress and coping strategies among Arab medical students: Towards a research agenda. *Educ Heal Chang Learn Pract*. 2010;23(1):1-16. <http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2010-08590-008&site=ehost-live&scope=site>.

177. Gold JA, Hu X, Huang G, et al. Medical student depression and its correlates across three international medical schools. *World J Psychiatr.* 2019;9(4):65-77. doi:10.5498/wjp.v9.i4.65
178. Cuttilan AN, Sayampanathan AA, Ho RCM. Mental health issues amongst medical students in Asia: A systematic review [2000-2015]. *Ann Transl Med.* 2016;4(4). doi:10.3978/j.issn.2305-5839.2016.02.07
179. Jafari N, Loghmani A, Montazeri A. P-1011 - Mental health of medical students in different levels of training. *Eur Psychiatry.* 2012;27(Suppl1):1. doi:10.1016/s0924-9338(12)75178-7
180. Pokhrel NB, Khadayat R, Tulachan P. Depression, anxiety, and burnout among medical students and residents of a medical school in Nepal: A cross-sectional study. *BMC Psychiatry.* 2020;20(1):298. doi:10.1186/s12888-020-02645-6
181. Herrmann-Werner A, Junne F, Stuber F, et al. Reducing stress and promoting social integration of international medical students through a tandem program: Results of a prospective-program evaluation. *Int J Environ Res Public Health.* 2018;15(9):1959. doi:http://dx.doi.org/10.3390/ijerph15091959
182. Storrie K, Ahern K, Tuckett A. A systematic review: Students with mental health problems—A growing problem. *Int J Nurs Pract.* 2010;16(1):1-6. doi:10.1111/J.1440-172X.2009.01813.X
183. Grotan K, Sund ER, Bjerkeset O. Mental health, academic self-efficacy and study progress among college students - The SHoT study, Norway. *Front Psychol.* 2019;10(JAN):45. doi:10.3389/FPSYG.2019.00045/BIBTEX
184. Khadjooi K, Scott P. Effects of pregnancy and parenthood on studying medicine. *Med Educ Suppl.* 2011;45(SUPPL. 2):105-106. doi:http://dx.doi.org/10.1111/j.13652923.2011.04095.x
185. Chur-Hansen A. Mature-aged medical students: a qualitative study. *Learn Heal Soc Care.* 2003;2(3):159-168. <http://search.ebscohost.com/login.aspx?direct=true&db=jlh&AN=106653454&site=ehost-live&scope=site>.
186. Morrison N, Machado M. Student perspectives on barriers to performance for black and minority ethnic graduate-entry medical students: A qualitative study in a West Midlands medical school. *BMJ Open.* 2019;9(11):e032493. doi:http://dx.doi.org/10.1136/bmjopen-2019-032493
187. Toman L. Navigating medical culture and LGBTQ identity. *Clin Teach.* 2019;16(4):335-338. doi:https://dx.doi.org/10.1111/tct.13078

188. Senior PA, Bhopal R. Ethnicity as a variable in epidemiological research. *BMJ*. 1994;309(6950):327. doi:10.1136/bmj.309.6950.327
189. Woolf K, Potts HWWW, McManus IC. Ethnicity and academic performance in UK trained doctors and medical students: Systematic review and meta-analysis. *BMJ*. 2011;342. doi:10.1136/bmj.d901
190. Hope D, Dewar A, Hothersall EJ, Leach JP, Cameron I, Jaap A. Measuring differential attainment: a longitudinal analysis of assessment results for 1512 medical students at four Scottish medical schools. doi:10.1136/bmjopen-2020-046056
191. Woolf K. Differential attainment in medical education and training. 2020;368. doi:10.1136/bmj.m339
192. GMC. How do doctors progress through key milestones during training? www.gmc-uk.org/-/media/documents/How_do_doctors_progress_through_key_milestones_in_training.pdf_67018769.pdf. Accessed February 11, 2022.
193. Esmail A, Everington S. Racial discrimination against doctors from ethnic minorities. *Br Med J*. 1993;306(6879):691-692. doi:10.1136/bmj.306.6879.691
194. Woolf K, Mcmanus IC, Potts HWWW, Dacre J. The mediators of minority ethnic underperformance in final medical school examinations. *Br J Educ Psychol*. 2013;83(1):135-159. doi:10.1111/j.2044-8279.2011.02060.x
195. Mountford-Zimdars A, Sanders J, Moore J, Sabri D, Jones S, Higham L. What can universities do to support all their students to progress successfully throughout their time at university? <https://doi.org/10.1080/1360310820161203368>. 2016;21(2-3):101-110. doi:10.1080/13603108.2016.1203368
196. Dillner L. Manchester tackles failure rate of Asian students. *BMJ*. 1995;310(6974):209. doi:10.1136/bmj.310.6974.209
197. Woolf K, Potts HWW, Patel S, McManus IC. The hidden medical school: A longitudinal study of how social networks form, and how they relate to academic performance. In: *Medical Teacher*. Vol 34. Informa Healthcare; 2012:577-586. doi:10.3109/0142159X.2012.669082
198. Bourdieu P. The forms of capital. In: *The Sociology of Economic Life, Third Edition*. ; 2018:78-92. doi:10.4324/9780429494338
199. Wells R. Social and cultural capital, race and ethnicity, and college student retention. *J Coll*

- Student Retent Res Theory Pract.* 2008;10(2):103-128. doi:10.2190/CS.10.2.a
200. Woolf K, Rich A, Viney R, Needleman S, Griffin A. Perceived causes of differential attainment in UK postgraduate medical training: A national qualitative study. *BMJ Open.* 2016;6(11). doi:10.1136/bmjopen-2016-013429
201. Hallock JA, Mckinley DW, Boulet JR. Migration of doctors for undergraduate medical education. *Med Teach.* 2007;29(2–3):98-105. doi:10.1080/01421590701268723
202. Huhn D, Resch F, Duelli R, et al. Prüfungsleistung Deutscher und internationaler medizinstudierender im vorklinischen studienabschnitt - Eine bestandsaufnahme. *GMS Z Med Ausbild.* 2014;31(3). doi:10.3205/ZMA000921
203. Mann C, Canny B, Lindley J, Rajan R. The influence of language family on academic performance in Year 1 and 2 MBBS students. *Med Educ.* 2010;44:786-794. doi:10.1111/j.1365-2923.2010.03711.x
204. Wass V, Roberts C, Hoogenboom R, Jones R, Van Der Vleuten C. Effect of ethnicity on performance in a final objective structured clinical examination: qualitative and quantitative study. *BMJ.* 2003;326(7393):800-803. doi:10.1136/bmj.326.7393.800
205. Liddell MJ, Koritsas S, MJ L, Koritsas S. Effect of medical students' ethnicity on their attitudes towards consultation skills and final year examination performance. *Med Educ.* 2004;38(2):187-198. doi:10.1111/J.1365-2923.2004.01753.X
206. Huhn D, Lauter J, Roesch Ely D, et al. Performance of International Medical Students in psychosocial medicine. *BMC Med Educ.* 2017;17(1):1-7. doi:10.1186/S12909-017-0950-Z/TABLES/2
207. Huhn D, Huber J, Ippen FM, et al. International medical students' expectations and worries at the beginning of their medical education: A qualitative focus group study. *BMC Med Educ.* 2016;16(1). <https://bmcmmededuc.biomedcentral.com/articles/10.1186/s12909-016-0549-9>. Accessed June 23, 2020.
208. Manning G, Garrud P. Comparative attainment of 5-year undergraduate and 4-year graduate entry medical students moving into foundation training. *BMC Med Edu.* 2009;9(1):76. doi:10.1186/1472-6920-9-76
209. Shehmar M, Haldane T, Price-Forbes A, et al. Comparing the performance of graduate-entry and school-leaver medical students. *Med Educ.* 2010;44(7):699-705. doi:10.1111/j.1365-2923.2010.03685.x

210. Calvert MJ, Ross NM, Freemantle N, Xu Y, Zvauya R, Parle J V. Examination performance of graduate entry medical students compared with mainstream students. *JRSM*. 2009;102(10):425-430. doi:10.1258/jrsm.2009.090121
211. Dodds AE, Reid KJ, Conn JJ, Elliott SL, McColl GJ. Comparing the academic performance of graduate-and undergraduate-entry medical students. *Med Educ*. 2010;44(2):197-204. doi:10.1111/j.1365-2923.2009.03559.x
212. Price R, Wright SR. Comparisons of examination performance between “conventional” and graduate entry Programme students. *Med Teach*. 2010;32(1):80-82. doi:10.3109/01421590903196961
213. Knight J, Stead AP, Geyton TO. Comparing the academic performance of graduate-entry and undergraduate medical students at a UK medical school. *Educ Heal*. 2017;30(1):75. doi:10.4103/EFH.EFH_157_15
214. Kick S, Adams L, O’Brien-Gonzales A. Unique issues of older medical students. *Teach Learn Med*. 2000;12(3):150-155. doi:10.1207/S15328015TLM1203_6
215. Meeks LM, of Michigan Medical School U, Jain NR, of Auckland U, of Education F, Work S. Accessibility, Inclusion, and Action in Medical Education Lived Experiences of Learners and Physicians With Disabilities. 2018.
216. Rosebraugh CJ. Learning disabilities and medical schools. *Med Educ*. 2008;34(12):994-1000. doi:10.1111/j.1365-2923.2000.00689.x
217. Herzer KR. Moving from disability to possibility. *JAMA - J Am Med Assoc*. 2016;316(17):1767-1768. doi:10.1001/jama.2016.9956
218. Byron M, Cockshott Z, Brownnett H, Ramkalawan T. What does “disability” mean for medical students? An exploration of the words medical students associate with the term “disability.” *Med Educ*. 2005;39(2):176-183. doi:10.1111/j.1365-2929.2004.02062.x
219. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. American Psychiatric Association; 2013. doi:10.1176/appi.books.9780890425596
220. Kapp SK, Gillespie-Lynch K, Sherman LE, Hutman T. Deficit, difference, or both? Autism and neurodiversity. *Dev Psychol*. 2013;49(1):59-71. doi:10.1037/a0028353
221. Walters JA, Croen LG. An Approach to Meeting the Needs of Medical Students With Learning Disabilities. *Teach Learn Med*. 1993;5(1):29-35. doi:10.1080/10401339309539584

222. Council GM. *Good Medical Practice*. www.gmc-uk.org/guidance. Accessed March 17, 2021.
223. Giroux M, Pélissier-Simard L. Shedding light on autistic traits in struggling learners: A blind spot in medical education. *Perspect Med Educ*. February 2021;1-7. doi:10.1007/s40037-021-00654-z
224. Baron-Cohen S. *Mindblindness*. The MIT Press; 2019. doi:10.7551/mitpress/4635.001.0001
225. Happé F, Frith U. The weak coherence account: Detail-focused cognitive style in autism spectrum disorders. *J Autism Dev Disord*. 2006;36(1):5-25. doi:10.1007/s10803-005-0039-0
226. Miyake A, Friedman NP, Emerson MJ, Witzki AH, Howerter A, Wager TD. The Unity and Diversity of Executive Functions and Their Contributions to Complex “Frontal Lobe” Tasks: A Latent Variable Analysis. *Cogn Psychol*. 2000;41(1):49-100. doi:10.1006/cogp.1999.0734
227. Risdon C, Cook D, Willms D. Gay and lesbian physicians in training: a qualitative study. *C Can Med Assoc J*. 2000;162(3):331. /pmc/articles/PMC1231011/?report=abstract. Accessed February 15, 2022.
228. Mansh M, White W, Gee-Tong L, et al. Sexual and gender minority identity disclosure during undergraduate medical education: “in the closet” in medical school. *Acad Med*. 2015;90(5):634-644. doi:10.1097/ACM.0000000000000657
229. Kalet A, Chou CL. *Remediation in Medical Education: A Mid-Course Correction*. Springer New York; 2014. doi:10.1007/978-1-4614-9025-8
230. Guerrasio J, Garrity MJ, Aagaard EM. Learner Deficits and Academic Outcomes of Medical Students, Residents, Fellows, and Attending Physicians Referred to a Remediation Program, 2006–2012. *Acad Med*. 2014;89(2):352-358. doi:10.1097/ACM.0000000000000122
231. Price T, Wong G, Withers L, et al. Optimising the delivery of remediation programmes for doctors: a realist review. *Med Educ*. March 2021. doi:10.1111/medu.14528
232. Lacasse M, Audétat MC, Boileau É, et al. Interventions for undergraduate and postgraduate medical learners with academic difficulties: A BEME systematic review: BEME Guide No. 56. *Med Teach*. 2019;41(9):981-1001. doi:10.1080/0142159X.2019.1596239
233. Hauer KE, Ciccone A, Henzel TR, et al. Remediation of the Deficiencies of Physicians Across the Continuum From Medical School to Practice: A Thematic Review of the Literature. *Acad Med*. 2009;84(12):1822-1832. doi:10.1097/ACM.0b013e3181bf3170
234. Brennan N, Price T, Archer J, Brett J. Remediating professionalism lapses in medical students

- and doctors: A systematic review. *Med Educ.* 2020;54(3):196-204. doi:10.1111/medu.14016
235. Kalet A, Guerrasio J, Chou CL. Twelve tips for developing and maintaining a remediation program in medical education. *Med Teach.* 2016;38(8):787-792. doi:10.3109/0142159X.2016.1150983
236. Cruess RL, Cruess SR. Expectations and obligations: professionalism and medicine's social contract with society. *Perspect Biol Med.* 2008;51(4):579-598. doi:10.1353/PBM.0.0045
237. Frellsen SL, Baker EA, Papp KK, et al. Medical school policies regarding struggling medical students during the internal medicine clerkships: Results of a national survey. *Acad Med.* 2008;83(9):876-881. doi:http://dx.doi.org/10.1097/ACM.0b013e318181da98
238. Cox SM. "forward feeding" about students' progress: information on struggling medical students should not be shared among clerkship directors or with students' current teachers. *Acad Med.* 2008;83(9):801. doi:10.1097/ACM.0B013E318181CFE6
239. Cleland J, Cilliers F, van Schalkwyk S. *The Learning Environment in Remediation: A Review.* Vol 15. Blackwell Publishing Ltd; 2018:13-18. doi:10.1111/tct.12739
240. Ellaway RH, Chou CL, Kalet AL. Situating Remediation. *Acad Med.* 2018;93(3):391-398. doi:10.1097/ACM.0000000000001855
241. Schraw G. Promoting General Metacognitive Awareness. 2001:3-16. doi:10.1007/978-94-017-2243-8_1
242. Boileau E, St-Onge C, Audétat M-C. Is there a way for clinical teachers to assist struggling learners? A synthetic review of the literature. *Adv Med Educ Pract.* 2017;8:89. doi:10.2147/AMEP.S123410
243. Krzyzaniak SM, Wolf SJ, Byyny R, et al. A qualitative study of medical educators' perspectives on remediation: Adopting a holistic approach to struggling residents. *Med Teach.* 2017;39(9):967-974. doi:10.1080/0142159X.2017.1332362
244. Winston KA, van der Vleuten CPM, Scherpbier AJJA. Prediction and prevention of failure: An early intervention to assist at-risk medical students. *Med Teach.* 2014;36(1):25-31. doi:10.3109/0142159X.2013.836270
245. Yates J. Development of a "toolkit" to identify medical students at risk of failure to thrive on the course: an exploratory retrospective case study. *BMC Med Educ 2011 111.* 2011;11(1):1-10. doi:10.1186/1472-6920-11-95

246. Shaban S, McLean M. Predicting performance at medical school: can we identify at-risk students? *Adv Med Educ Pract.* 2011;2:139. doi:10.2147/AMEP.S19391
247. Kruger J, Dunning D. Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments. *J Pers Soc Psychol.* 1999;77(6):1121-1134. doi:10.1037//0022-3514.77.6.1121
248. Hauer KE, Teherani A, Kerr KM, O'Sullivan PS, Irby DM. Student performance problems in medical school clinical skills assessments. *Acad Med.* 2007;82(10 SUPPL.). doi:10.1097/ACM.0B013E31814003E8
249. Coelho C, Zahra D, Ali K, Tredwin C. To accept or decline academic remediation: What difference does it make? *Med Teach.* 2019;41(7):824-829. doi:10.1080/0142159X.2019.1585789
250. Prescott-Clements L, Voller V, Bell M, Nestors N, van der Vleuten CPM. Rethinking Remediation: A Model to Support the Detailed Diagnosis of Clinicians' Performance Problems and the Development of Effective Remediation Plans. *J Contin Educ Health Prof.* 2017;37(4):245-254. doi:10.1097/CEH.000000000000173
251. Hinson J, Griffin A, Raven P. How to support medical students in difficulty: tips for GP tutors. *Educ Prim Care.* 2011;22(1):32-42. doi:10.1080/14739879.2011.11493959
252. Ziring D, Danoff D, Grosseman S, et al. How Do Medical Schools Identify and Remediate Professionalism Lapses in Medical Students? A Study of U.S. and Canadian Medical Schools. *Acad Med.* 2015;90(7):913-920. doi:10.1097/ACM.0000000000000737
253. Humphrey-Murto S, LeBlanc A, Touchie C, et al. The Influence of Prior Performance Information on Ratings of Current Performance and Implications for Learner Handover: A Scoping Review. *Acad Med.* 2019;94(7):1050-1057. doi:10.1097/ACM.0000000000002731
254. Gold W, McArdle P, Federman D. Should medical school faculty see assessments of students made by previous teachers? *Acad Med.* 2002;77(11):1096-1100. doi:10.1097/00001888-200211000-00006
255. Cohen G, P B. Investigating whether teachers should be given assessments of students made by previous teachers. *Acad Med.* 1991;66(5):288-289. doi:10.1097/00001888-199105000-00013
256. Cleary L. "Forward feeding" about students' progress: the case for longitudinal, progressive, and shared assessment of medical students. *Acad Med.* 2008;83(9):800-803.

- doi:10.1097/ACM.0B013E318181CFBC
257. Pangaro L. "Forward feeding" about students' progress: More information will enable better policy. *Acad Med*. 2008;83(9):800-803. doi:10.1097/ACM.0B013E318181CFBC
258. Cleland JA, Knight L V, Rees CE, et al. Is it me or is it them? Factors that influence the passing of underperforming students. *Med Educ*. 2008;42(8):800-809. doi:10.1111/j.1365-2923.2008.03113.x
259. Winston K. Core Concepts in Remediation: Lessons Learned from a 6-Year Case Study. *Med Sci Educ* 2015 253. 2015;25(3):307-315. doi:10.1007/S40670-015-0149-Z
260. Sayer M, Chaput De Saintonge M, Evans D, et al. Support for students with academic difficulties. *Med Educ*. 2002;36(7):643-650. doi:http://dx.doi.org/10.1046/j.1365-2923.2002.01259.x
261. Stegers-Jager KM, Cohen-Schotanus J, Themmen APN. The effect of a short integrated study skills programme for first-year medical students at risk of failure: A randomised controlled trial. *Med Teach*. 2013;35(2):120-126. doi:10.3109/0142159X.2012.733836
262. Artino AR, Hemmer PA, Durning SJ. Using Self-Regulated Learning Theory to Understand the Beliefs, Emotions, and Behaviors of Struggling Medical Students. *Acad Med*. 2011;86:S35-S38. doi:10.1097/ACM.0b013e31822a603d
263. Durning SJ, Cleary TJ, Sandars J, Hemmer P, Kokotailo P, Artino AR. *Perspective: Viewing "Strugglers" through a Different Lens: How a Self-Regulated Learning Perspective Can Help Medical Educators with Assessment and Remediation*. Vol 86. Lippincott Williams and Wilkins; 2011:488-495. doi:10.1097/ACM.0b013e31820dc384
264. Cleland J, Arnold R, Chesser A. Failing finals is often a surprise for the student but not the teacher: identifying difficulties and supporting students with academic difficulties. *Med Teach*. 2005;27(6):504-508. doi:10.1080/01421590500156269
265. Dignath C, Büttner G. Components of fostering self-regulated learning among students. A meta-analysis on intervention studies at primary and secondary school level. *Metacognition Learn* 2008 33. 2008;3(3):231-264. doi:10.1007/S11409-008-9029-X
266. Weinstein CE, Husman J, Dierking DR. Self-Regulation Interventions with a Focus on Learning Strategies. *Handb Self-Regulation*. 2000:727-747. doi:10.1016/B978-012109890-2/50051-2
267. Butler DL. The Strategic Content Learning Approach to Promoting Self-Regulated Learning: A

- Report of Three Studies. *J Educ Psychol*. 1998;90(4):682-697. doi:10.1037/0022-0663.90.4.682
268. Brokaw JJ, Torbeck LJ, Bell MA, Deal DW. Impact of a Competency-Based Curriculum on Medical Student Advancement: A Ten-Year Analysis. <https://doi.org/10.1080/104013342011586910>. 2011;23(3):207-214. doi:10.1080/10401334.2011.586910
269. Gill AC, Nelson EA, Mian AI, Raphael JL, Rowley DR, Mcguire AL. Responding to moderate breaches in professionalism: An intervention for medical students. *Med Teach*. 2015;37(2):136. doi:10.3109/0142159X.2014.911270
270. Cullen MJ, Konia MR, Borman-Shoap EC, et al. Not all unprofessional behaviors are equal: The creation of a checklist of bad behaviors. <https://doi.org/10.1080/0142159X20161231917>. 2016;39(1):85-91. doi:10.1080/0142159X.2016.1231917
271. Mak-van der Vossen MC, de la Croix A, Teherani A, van Mook WNKA, Croiset G, Kusurkar RA. A Road Map for Attending to Medical Students' Professionalism Lapses. *Acad Med*. 2019;94(4):570-578. doi:10.1097/ACM.0000000000002537
272. Winston KA, Van Der Vleuten CP, Scherpbier AJ. Remediation of at-risk medical students: theory in action. *BMC Med Educ*. 2013;13(1):132. doi:http://dx.doi.org/10.1186/1472-6920-13-132
273. Winston KA, Van Der Vleuten CPM, Scherpbier AJA. At-risk medical students: implications of students' voice for the theory and practice of remediation. *Med Educ*. 2010;44(10):1038-1047. doi:10.1111/j.1365-2923.2010.03759.x
274. Kirtchuk D, Wells G, Levett T, Castledine C, Visser R de. Understanding the impact of academic difficulties among medical students: A scoping review. *Med Educ*. 2021. doi:10.1111/MEDU.14624
275. Tai JH, Canny BJ, Haines TP, Molloy EK. Identifying Opportunities for Peer Learning: An Observational Study of Medical Students on Clinical Placements. <https://doi.org/10.1080/1040133420161165101>. 2016;29(1):13-24. doi:10.1080/10401334.2016.1165101
276. Winston KA, Van Der Vleuten CPM, Scherpbier AJA, et al. The role of the teacher in remediating at-risk medical students. *Med Teach*. 2012;34(11):e732-742. doi:10.3109/0142159X.2012.689447

277. Stegers-Jager KM, Cohen-Schotanus J, Themmen APN. Motivation, learning strategies, participation and medical school performance. *Med Educ.* 2012;46(7):678-688. doi:10.1111/j.1365-2923.2012.04284.x
278. Pell G, Fuller R, Homer M, Roberts T. Is short-term remediation after OSCE failure sustained? A retrospective analysis of the longitudinal attainment of underperforming students in OSCE assessments. <https://doi.org/103109/0142159X2012643262>. 2012;34(2):146-150. doi:10.3109/0142159X.2012.643262
279. Alexander R, Badenhorst E, Gibbs T. Intervention programme: a supported learning programme for educationally disadvantaged students. <https://doi.org/101080/01421590400016472>. 2009;27(1):66-70. doi:10.1080/01421590400016472
280. Hauer KE, O'Brien BC, Hansen LA, et al. More is better: Students describe successful and unsuccessful experiences with teachers differently in brief and longitudinal relationships. *Acad Med.* 2012;87(10):1389-1396. doi:10.1097/ACM.0b013e31826743c3
281. Saks N, Rashid H, Labeau R. *A National Survey of US Medical Schools: Current Status of Academic Support. Vol 12. Seattle. WA. Presented at AAMC Conference.; 2016.* [https://scholar.google.com/scholar_lookup?title=National Survey of US medical schools%3A current status of academic support&publication_year=2016&author=Saks%2CN&author=Rashid%2CH&author=Lebeau%2CRA](https://scholar.google.com/scholar_lookup?title=National+Survey+of+US+medical+schools%3A+current+status+of+academic+support&publication_year=2016&author=Saks%2CN&author=Rashid%2CH&author=Lebeau%2CRA). Accessed August 23, 2021.
282. Kalet A, Zabar S. Preparing to Conduct Remediation. *Remediat Med Educ A Mid-Course Correct.* January 2014:311-322. doi:10.1007/978-1-4614-9025-8_19
283. Yepes-Rios M, Dudek N, Duboyce R, Curtis J, Allard RJ, Varpio L. The failure to fail underperforming trainees in health professions education: A BEME systematic review: BEME Guide No. 42. 2016;38(11):1092-1099. doi:10.1080/0142159X.2016.1215414
284. Dudek NL, Marks MB, Regehr G. Failure to fail: The perspectives of clinical supervisors. *Acad Med.* 2005;80(10 SUPPL.). doi:10.1097/00001888-200510001-00023
285. Ziring D, Frankel R, Danoff D, Isaacson J, Lochnan H. Silent Witnesses: Faculty Reluctance to Report Medical Students' Professionalism Lapses. *Acad Med.* 2018;93(11):1700-1706. doi:10.1097/ACM.0000000000002188
286. Department of Health. *Aspiring to Excellence: Final Report of the Independent Inquiry into*

- Modernising Medical Careers Led by Professor Sir John Tooke.*; 2007.
287. Medical Schools Council. Improving Selection to the Foundation Programme Final Report
Medical Schools Council Improving Selection to the Foundation Programme Final Report
Improving Selection to the Foundation Programme Final Report. 2011.
 288. Simon E, Walsh K, Paterson-Brown F, Cahill D. Does a high ranking mean success in the
Situational Judgement Test? *Clin Teach*. 2015;12(1):42-45. doi:10.1111/TCT.12239
 289. Patterson F, Zibarras L, Ashworth V. Situational judgement tests in medical education and
training: Research, theory and practice: AMEE Guide No. 100.
<https://doi.org/10.3109/0142159X20151072619>. 2015;38(1):3-17.
doi:10.3109/0142159X.2015.1072619
 290. Smith DT, Tiffin PA. Evaluating the validity of the selection measures used for the UK's
foundation medical training programme: a national cohort study. *BMJ Open*.
2018;8(7):e021918. <https://bmjopen.bmj.com/content/8/7/e021918>. Accessed May 19,
2020.
 291. UK Foundation Programme. *England Northern Ireland Scotland Wales 2020 Recruitment Stats
and Facts Report.*; 2020.
[https://healtheducationengland.sharepoint.com/sites/UKFPOT/WebDocs/Forms/AllItems.aspx?id=%2Fsites%2FUKFPOT%2FWebDocs%2F6.Resources%2FReports%2F2020 Recruitment
Stats and Facts Report_FINAL.pdf&parent=%2Fsites%2FUKFPOT%2FWebDocs%2F6.
Resources%2FReports&](https://healtheducationengland.sharepoint.com/sites/UKFPOT/WebDocs/Forms/AllItems.aspx?id=%2Fsites%2FUKFPOT%2FWebDocs%2F6.Resources%2FReports%2F2020%20Recruitment%20Stats%20and%20Facts%20Report_FINAL.pdf&parent=%2Fsites%2FUKFPOT%2FWebDocs%2F6.Resources%2FReports&). Accessed February 16, 2022.
 292. Miah S, Pang KH, Rebello W, et al. What factors influence UK medical students' choice of
foundation school? *Adv Med Educ Pract*. 2017;8:293-297. doi:10.2147/AMEP.S134081
 293. Patel S, Colaco HB, Hossain FS. Factors influencing foundation programme choice among
medical students. *JRSM Short Rep*. 2010;1(1):1-3. doi:10.1258/SHORTS.2009.100056
 294. Kumwenda B, Cleland JA, Prescott GJ, Walker K, Johnston PW. Relationship between
sociodemographic factors and selection into UK postgraduate medical training programmes:
a national cohort study. *BMJ Open*. 2018;8:21329. doi:10.1136/bmjopen-2017-021329
 295. Webster ES, Paton LW, Crampton PES, Tiffin PA. Situational judgement test validity for
selection: A systematic review and meta-analysis. *Med Educ*. 2020;54(10):888-902.
doi:10.1111/MEDU.14201
 296. Patterson F, Knight A, Dowell J, Nicholson S, Cousans F, Cleland J. How effective are selection

- methods in medical education? A systematic review. *Med Educ.* 2016;50(1):36-60.
doi:10.1111/medu.12817
297. Walsh J, Harris B. Situational Judgement Tests: more important than educational performance? *BMJ.* 2013;346:f2207. doi:10.1136/BMJ.F2207
298. Sharma N. Medical students' perceptions of the situational judgement test: a mixed methods study. 2015;76(4):234-238. doi:10.12968/HMED.2015.76.4.234
299. Singagireson S, Ramjeeawon N, Ravindra S, Shah N, Singh B. Is it fair for a junior doctor's deanery to be largely based on one test: a student's perspective. *Adv Med Educ Pract.* 2015;6:499. doi:10.2147/AMEP.S88360
300. McManus IC, Elder AT, de Champlain A, Dacre JE, Mollon J, Chis L. Graduates of different UK medical schools show substantial differences in performance on MRCP(UK) Part 1, Part 2 and PACES examinations. *BMC Med.* 2008;6. doi:10.1186/1741-7015-6-5
301. McManus IC, Harborne AC, Horsfall HL, et al. Exploring UK medical school differences: The MedDifs study of selection, teaching, student and F1 perceptions, postgraduate outcomes and fitness to practise. *BMC Med.* 2020;18(1):1-35. doi:10.1186/S12916-020-01572-3/FIGURES/8
302. Kruzicevic SM, Barisic KJ, Banozic A, Esteban CD, Sapunar D, Puljak L. Predictors of attrition and academic success of medical students: A 30-year retrospective study. *PLoS One.* 2012;7(6):39144. doi:10.1371/journal.pone.0039144
303. Bakhsh T. Analysis of Attrition over a 7-Year Period at the Faculty of Medicine, King Abdulaziz University, Jeddah دراسة تحليلية للفاقد الدراسي على مدى سبع سنوات بكلية سنوات سابع على الدراسي للفاقد تحليلية دراسة Jeddah. *J King Abdulaziz Univ Sci.* 2008;15(4):49-57. doi:10.4197/med.15-4.5
304. Sam AH, Bala L, Westacott RJ, Brown C. Is Academic Attainment or Situational Judgment Test Performance in Medical School Associated With the Likelihood of Disciplinary Action? A National Retrospective Cohort Study. *Acad Med.* 2021;96(10):1467-1475.
doi:10.1097/ACM.0000000000004212
305. Kaushik V, Walsh CA. Pragmatism as a Research Paradigm and Its Implications for Social Work Research. *Soc Sci 2019, Vol 8, Page 255.* 2019;8(9):255. doi:10.3390/SOCSCI8090255
306. Creswell JW, Plano Clark VL. *Designing and Conducting Mixed Methods Research. 2nd Edition.* Los Angeles; 2011.

307. Goles T, Hirschheim R. The paradigm is dead, the paradigm is dead . . . long live the paradigm: The legacy of Burrell and Morgan. *Omega*. 2000;28(3):249-268. doi:10.1016/S0305-0483(99)00042-0
308. Crotty M. The foundations of social research : meaning and perspective in the research process. 1998:248.
309. Fairhurst GT, Grant D. The Social Construction of Leadership: A Sailing Guide: <http://dx.doi.org/10.1177/0893318909359697>. 2010;24(2):171-210. doi:10.1177/0893318909359697
310. Arawi T, Rosoff PM. Competing duties: Medical educators, underperforming students, and social accountability. *J Bioeth Inq*. 2012;9(2):135-147. doi:10.1007/s11673-012-9365-z
311. Ajjawi R, Dracup M, Zacharias N, Bennett S, Boud D. Persisting students' explanations of and emotional responses to academic failure. 39(2):185-199. doi:10.1080/07294360.2019.1664999
312. Holmes D. Eight years' experience of widening access to medical education. *Med Educ*. 2002;36(10):979-984. doi:10.1046/j.1365-2923.2002.01269.x
313. Burch VC, Sikakana CNTT, Gunston GD, Shamley DR, Murdoch-Eaton D. Generic learning skills in academically-at-risk medical students: A development programme bridges the gap. *Med Teach*. 2013;35(8):671-677. doi:10.3109/0142159X.2013.801551
314. Levac D, Colquhoun H, O'Brien KK. Scoping studies: Advancing the methodology. *Implement Sci*. 2010;5(1). doi:10.1186/1748-5908-5-69
315. Nha HONG Q, Pluye P, Fàbregues S, et al. MIXED METHODS APPRAISAL TOOL (MMAT) VERSION 2018 User guide. <http://mixedmethodsappraisaltoolpublic.pbworks.com/>. Accessed August 24, 2022.
316. Sajid A, Ahmad T. Stress in medical undergraduates; its association with academic performance. *Bangladesh J Med Sci*. 2015;14(2):135-141. doi:http://dx.doi.org/10.3329/bjms.v14i2.21815
317. Given K, Hannigan A, McGrath D, et al. Red, yellow and green: What does it mean? How the progress test informs and supports student progress. *Med Teach*. 2016;38(10):1025-1032. doi:10.3109/0142159X.2016.1147533
318. McLean M. A comparison of students who chose a traditional or a problem-based learning

- curriculum after failing year 2 in the traditional curriculum: a unique case study at the Nelson R. Mandela School of Medicine. *Teach Learn Med*. 2004;16(3):301-303.
doi:http://dx.doi.org/10.1207/s15328015t1m1603_15
319. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101.
doi:10.1191/1478088706qp063oa
 320. Anderson PAM. Giving Feedback on Clinical Skills: Are We Starving Our Young? *J Grad Med Educ*. 2012;4(2):154-158. doi:10.4300/jgme-d-11-000295.1
 321. Kornegay JG, Kraut A, Manthey D, et al. Feedback in Medical Education: A Critical Appraisal. *AEM Educ Train*. 2017;1(2):98-109. doi:10.1002/aet2.10024
 322. Dignath C, Buettner G, Langfeldt HP. How can primary school students learn self-regulated learning strategies most effectively?: A meta-analysis on self-regulation training programmes. *Educ Res Rev*. 2008;3(2):101-129. doi:10.1016/J.EDUREV.2008.02.003
 323. Bandura A. Social Cognitive Theory of Self-Regulation. *Organ Behav Hum Decis Process*. 1991;50:248-287. <http://www.uky.edu/~eushe2/Bandura/Bandura1991OBHDP.pdf>. Accessed November 9, 2020.
 324. Cho KK, Marjadi B, Langendyk V, Hu W. The self-regulated learning of medical students in the clinical environment - A scoping review. *BMC Med Educ*. 2017;17(1):112.
doi:10.1186/s12909-017-0956-6
 325. Ten Cate O, Durning S. Peer teaching in medical education: Twelve reasons to move from theory to practice. *Med Teach*. 2007;29(6):591-599. doi:10.1080/01421590701606799
 326. Prunuske A, Houss BA, Kosobuski AW. Alignment of roles of near-peer mentors for medical students underrepresented in medicine with medical education competencies: A qualitative study. *BMC Med Educ*. 2019;19(1):417. doi:10.1186/s12909-019-1854-x
 327. Carr SE, Canny BJ, Wearn A, et al. Twelve tips for medical students experiencing an interruption in their academic progress. *Med Teach*. 2022;44(10):1081-1086.
doi:10.1080/0142159X.2021.1921134
 328. Watkins S, Bagg W, Curtis E, Yelder J. The student narrative of undergoing academic difficulty and remediation in a medical programme: Indigenous Māori and Pacific Admission Scheme (MAPAS) and international student perspectives at The University of Auckland. *N Z Med J*. 2022;11(135):40-53. <https://journal.nzma.org.nz/journal-articles/the-student-narrative-of-undergoing-academic-difficulty-and-remediation-in-a-medical-programme-indigenous-maori->

- and-pacific-admission-scheme-mapas-and-international-student-perspectives-at-the-university-of-auc. Accessed March 4, 2023.
329. Picton A, Greenfield S, Parry J. Why do students struggle in their first year of medical school? A qualitative study of student voices. *BMC Med Educ.* 2022;22(1):1-13. doi:10.1186/S12909-022-03158-4/TABLES/1
 330. Foong CC, Bashir Ghouse NL, Lye AJ, Pallath V, Hong WH, Vadivelu J. Differences between high- and low-achieving pre-clinical medical students: a qualitative instrumental case study from a theory of action perspective. *Ann Med.* 2022;54(1):195. doi:10.1080/07853890.2021.1967440
 331. Bandaranayake RC. Setting and maintaining standards in multiple choice examinations: AMEE Guide No. 37. *Med Teach.* 2008;30(9-10):836-845. doi:10.1080/01421590802402247
 332. Cohen-Schotanus J, Van Der Vleuten CPM. A standard setting method with the best performing students as point of reference: Practical and affordable. *Med Teach.* 2010;32(2):154-160. doi:10.3109/01421590903196979
 333. Iacobucci D, Schneider MJ, Popovich DL, Bakamitsos GA. Mean centering helps alleviate “micro” but not “macro” multicollinearity. *Behav Res Methods.* 2016;48(4):1308-1317. doi:10.3758/S13428-015-0624-X/FIGURES/4
 334. Kraemer HC, Blasey CM. Centring in regression analyses: a strategy to prevent errors in statistical inference. *Int J Methods Psychiatr Res.* 13(3).
 335. Smith TJ, McKenna CM. A Comparison of Logistic Regression Pseudo R² Indices. *undefined.* 2013.
 336. Sander P, Putwain D, Fuente JD La. Using structural equation modelling to understand predictors of undergraduate students’ academic performance. *Int Perspect High Educ Res.* 2013;9:219-241. doi:10.1108/S1479-3628(2013)0000009015
 337. Daoud JI. Multicollinearity and Regression Analysis. *J Phys.* 2017:12009. doi:10.1088/1742-6596/949/1/012009
 338. Smith JA, Osborn M. Interpretative phenomenological analysis as a useful methodology for research on the lived experience of pain. *Br J Pain.* 2015;9(1):41. doi:10.1177/2049463714541642
 339. Smith JA, Flowers P, Larkin M. *Interpretative Phenomenological Analysis; Theory, Method and*

- Research*. Los Angeles: SAGE Publications Ltd (55 City Road, London EC1Y 1SP, United Kingdom); 2009.
340. Taylor C. What is human agency? *Hum Agency Lang*. June 1985:15-44.
doi:10.1017/CBO9781139173483.002
341. Tindall L. J.A. Smith, P. Flower and M. Larkin (2009), Interpretative Phenomenological Analysis: Theory, Method and Research . *Qual Res Psychol*. 2009;6(4):346-347.
doi:10.1080/14780880903340091
342. Ricoeur P. Freud & Philosophy: An Essay on Interpretation. 1970:573.
https://books.google.com/books/about/Freud_and_Philosophy.html?id=FyeHc74riTOC.
Accessed October 14, 2021.
343. Farrell E. Researching Lived Experience in Education: Misunderstood or Missed Opportunity?:
<https://doi.org/10.1177/1609406920942066>. 2020;19. doi:10.1177/1609406920942066
344. Heidegger M. Being and time. *Martin Heidegger Key Concepts*. 1962.
[https://www.scirp.org/\(S\(351jmbntvnsjt1aadkposzje\)\)/reference/ReferencesPapers.aspx?ReferenceID=1276938](https://www.scirp.org/(S(351jmbntvnsjt1aadkposzje))/reference/ReferencesPapers.aspx?ReferenceID=1276938). Accessed October 15, 2021.
345. Pietkiewicz I, Smith JA. A practical guide to using Interpretative Phenomenological Analysis in qualitative research psychology. *Czas Psychol Psychol J*. 2014;20(1). doi:10.14691/cppj.20.1.7
346. Van Manen M. Researching lived experience : human science for an action sensitive pedagogy. 1990:202.
347. Alase A. The Interpretative Phenomenological Analysis (IPA): A Guide to a Good Qualitative Research Approach. *Int J Educ Lit Stud*. 2017;5(2):9. doi:10.7575/aiac.ijels.v.5n.2p.9
348. Braun V, Clarke V. *Successful Qualitative Research: A Practical Guide for Beginners.*; 2013.
<https://books.google.co.uk/books?hl=en&lr=&id=nYMQAgAAQBAJ&oi=fnd&pg=PP2&dq=successful+qualitative+research+a+practical+guide+for+beginners&ots=SpOEwcJWap&sig=IH6I77W5mrlFxST7HajFen9hwt4>. Accessed January 16, 2020.
349. Creswell J, Poth C. *Qualitative Inquiry and Research Design: Choosing among Five Approaches.*; 2016.
<https://books.google.co.uk/books?hl=en&lr=&id=DLbBDQAAQBAJ&oi=fnd&pg=PP1&dq=creswell+qualitative+inquiry+and+research+design&ots=-gu93dKSRu&sig=nQ1MnsxvWkaZnfBop26V18RfWx8>. Accessed January 16, 2020.

350. Novick G. Is there a bias against telephone interviews in qualitative research? *Res Nurs Heal.* 2008;31(4):391-398. doi:10.1002/nur.20259
351. Hanna P. Using internet technologies (such as Skype) as a research medium: a research note. *Qual Res.* 2012;12(2):239-242. doi:10.1177/1468794111426607
352. Janghorban R, Roudsari RL, Taghipour A. Skype interviewing: The new generation of online synchronous interview in qualitative research. *Int J Qual Stud Health Well-being.* 2014;9(1). doi:10.3402/qhw.v9.24152
353. Krouwel M, Jolly K, Greenfield S. Comparing Skype (video calling) and in-person qualitative interview modes in a study of people with irritable bowel syndrome-an exploratory comparative analysis. *BMC Med Res Methodol.* 2019;19(1):219. doi:10.1186/s12874-019-0867-9
354. Entilli L. When the woman gets violent: the construction of domestic abuse experience from heterosexual men's perspective. *J Clin Nurs.* 2017;26(15-16):2328-2341. doi:http://dx.doi.org/10.1111/jocn.13500
355. Wong-Wylie LM, Rempel GR, Cook GR. *The Qualitative Report The Qualitative Report Expanding Qualitative Research Interviewing Strategies: Zoom Expanding Qualitative Research Interviewing Strategies: Zoom Video Communications Video Communications.* Vol 25.; 2020. <https://nsuworks.nova.edu/tqr/vol25/iss5/9>. Accessed December 17, 2020.
356. Opendakker R. Advantages and Disadvantages of Four Interview Techniques in Qualitative Research. *Forum Qual Sozialforsch.* 2006;7(4). https://www.researchgate.net/publication/48666088_Advantages_and_Disadvantages_of_Four_Interview_Techniques_in_Qualitative_Research_Electronic_Journal. Accessed December 17, 2020.
357. Seitz S. Pixilated partnerships, overcoming obstacles in qualitative interviews via Skype: a research note. *Qual Res.* 2016;16(2):229-235. doi:10.1177/1468794115577011
358. Deakin H, Wakefield K. Skype interviewing: reflections of two PhD researchers. *Qual Res.* 2014;14(5):603-616. doi:10.1177/1468794113488126
359. Given LM. Using Skype as a Research Tool: Lessons Learned from Qualitative Interviews with Distance Students in a Teacher-Librarianship Program. *Irsv.umd.edu.* https://www.academia.edu/1774333/Using_Skype_as_a_Research_Tool_Lessons_Learned_from_Qualitative_Interviews_with_Distance_Students_in_a_Teacher_Librarianship_Program.

- Accessed December 17, 2020.
360. Weller S. The potentials and pitfalls of using Skype for qualitative (longitudinal) interviews. August 2015.
 361. Cater JK. Skype: A cost effective method for qualitative research. https://www.academia.edu/540705/Skype_A_cost_effective_method_for_qualitative_research. Accessed December 17, 2020.
 362. Reid K, Flowers P, Larkin M. Exploring lived experience. *Psychologist*. 2005;18(1):20-23. <https://psycnet.apa.org/record/2005-02203-005>. Accessed September 16, 2021.
 363. Al-Jawad M, Czerwiec M. Research Methods in Health Humanities - Chapter 5 Comics. In: *Research Methods in Health Humanities*. Oxford University Press; 2019:78-99. doi:10.1093/MED/9780190918514.001.0001
 364. Irani E. The Use of Videoconferencing for Qualitative Interviewing: Opportunities, Challenges, and Considerations: <https://doi.org/10.1177/1054773818803170>. 2018;28(1):3-8. doi:10.1177/1054773818803170
 365. Mulhall A. In the field: Notes on observation in qualitative research. *J Adv Nurs*. 2003;41(3):306-313. doi:10.1046/J.1365-2648.2003.02514.X
 366. Phillippi J, Lauderdale J. A Guide to Field Notes for Qualitative Research: Context and Conversation: <https://doi.org/10.1177/1049732317697102>. 2017;28(3):381-388. doi:10.1177/1049732317697102
 367. Elo S, nursing HK-J of advanced, 2008 undefined. The qualitative content analysis process. *Wiley Online Libr*. 2008;62(1):107-115. doi:10.1111/j.1365-2648.2007.04569.x
 368. Emerson R, Fretz R, Shaw L. *Writing Ethnographic Fieldnotes.*; 2011. <https://books.google.com/books?hl=en&lr=&id=k83BlbBHubAC&oi=fnd&pg=PT3&ots=eOXxmImEMp&sig=S2qoexUf3MX0OP3e4eCIMZnp0V0>. Accessed October 19, 2021.
 369. Sandelowski M. Focus on qualitative methods. Notes on Transcription. *Res Nurs Health*. 1994;17(4):311-314. doi:10.1002/NUR.4770170410
 370. Tsai A, Kohrt B, Matthews L, ... TB-SS&, 2016 undefined. Promises and pitfalls of data sharing in qualitative research. *Elsevier*. https://www.sciencedirect.com/science/article/pii/S0277953616304269?casa_token=esTln5UWFBMAAAAA:3gZgbdYQ75w-

- orZr3Or8aVuffuiVth5vKS6FEoMveCNAYQpmlISm2Vv2AzTPqPEKSCQuH5mNrZg. Accessed October 19, 2021.
371. Watt D. On Becoming a Qualitative Researcher: The Value of Reflexivity. *Qual Rep.* 2007;12(1):82-101. doi:10.46743/2160-3715/2007.1645
372. Davidson C, Australia CR. Transcription: Imperatives for Qualitative Research. *Int J Qual Methods.* 2009;8(2).
373. Wengraf T. *Qualitative Research Interviewing: Semi-Structured, Biographical and Narrative Methods.* London: SAGE; 2001. doi: <http://dx.doi.org/10.4135/9781849209717.n1> Print. Accessed October 19, 2021.
374. Finlay L. *Phenomenology for Therapists: Researching the Lived World.* Chichester, UK: John Wiley & Sons, Ltd; 2011. doi:10.1002/9781119975144.CH9
375. What do HE students study?: Personal characteristics | HESA. <https://www.hesa.ac.uk/data-and-analysis/students/what-study/characteristics>. Accessed January 25, 2022.
376. Williamson JML, Osborne AJ. Critical Analysis of Case Based Discussions. *Br J Med Pract.* 2012;5(2):514. www.iscp.ac.uk. Accessed February 1, 2022.
377. Primhak R, Gibson N. Workplace-based assessment: how to use case-based discussion as a formative assessment. *Breathe.* 2019;15(3):163. doi:10.1183/20734735.0209-2019
378. Selamu LG, Singhe MS. Mental health distress and academic performance of medical students: a review. *J Psychol Clin Psychiatry.* 2018;Volume 9(Issue 6):675-678. doi:10.15406/JPCPY.2018.09.00609
379. McKendree J, Snowling MJ, MJ S. Examination results of medical students with dyslexia. *Med Educ.* 2011;45(2):176-182. doi:10.1111/j.1365-2923.2010.03802.x
380. Gibson S, Leinster S. How do students with dyslexia perform in extended matching questions, short answer questions and observed structured clinical examinations? *Adv Health Sci Educ Theory Pract.* 2011;16(3):395-404. doi:10.1007/S10459-011-9273-8
381. Ricketts C, Brice J, Coombes L. Are multiple choice tests fair to medical students with specific learning disabilities? *Adv Health Sci Educ Theory Pract.* 2010;15(2):265-275. doi:10.1007/S10459-009-9197-8
382. Reiss D, Kirtchuk G. Interpersonal dynamics and multidisciplinary teamwork. *Adv Psychiatr Treat.* 2009;15(6):462-469. doi:10.1192/APT.BP.107.004796

383. Langford J, Clance PR. The imposter phenomenon: Recent research findings regarding dynamics, personality and family patterns and their implications for treatment. *undefined*. 1993;30(3):495-501. doi:10.1037/0033-3204.30.3.495
384. Chang EK, Wimmers PF. Effect of Repeated/Spaced Formative Assessments on Medical School Final Exam Performance. *Heal Prof Educ*. 2017;3(1):32-37. doi:10.1016/J.HPE.2016.08.001
385. Ajjawi R, Dracup M, Boud D. Hero, survivor or stuck: a narrative analysis of student constructions of persistence after failure. 2021. doi:10.1080/13562517.2021.1952569
386. Peelo M. *Failing Students in Higher Education*. Buckingham [England] ;;Philadelphia: Society for Research into Higher Education & Open University Press; 2002.
387. Sartania N, Alldridge L, Ray C. Barriers to access, transition and progression of Widening Participation students in UK Medical Schools: The students' perspective. *MedEdPublish*. 2021;10(1). doi:10.15694/MEP.2021.000132.1
388. NHS Scotland Deanery. IMG Buddy System. <https://www.scotlanddeanery.nhs.scot/trainee-information/international-medical-graduates-imgs/scottish-img-buddy-system/>. Accessed February 23, 2022.
389. Valero-Sanchez I, McKimm J, Green R. A helping hand for international medical graduates. *BMJ*. 2017;359:j5230. doi:10.1136/BMJ.J5230
390. Bowyer E, K. Shaw S. Informal near-peer teaching in medical education: A scoping review. *Educ Heal*. 2021;34(1):29. doi:10.4103/EFH.EFH_20_18
391. Kahu ER, Nelson K. Student engagement in the educational interface: understanding the mechanisms of student success. 37(1):58-71. doi:10.1080/07294360.2017.1344197
392. Ajjawi R, Boud D, Zacharias N, Dracup M, Bennett S. How do students adapt in response to academic failure? *Student Success*. 2019;10(3):84-91. doi:10.5204/SSJ.V10I3.1403
393. Hauer KE, Teherani A, Dechet A, Aagaard EM. Medical students' perceptions of mentoring: a focus-group analysis. <https://doi.org/10.1080/01421590500271316>. 2009;27(8):732-734. doi:10.1080/01421590500271316
394. Rabatin JS, Lipkin M, Rubin AS, Schachter A, Nathan M, Kalet A. A year of mentoring in academic medicine. *J Gen Intern Med* 2004 195. 2004;19(5):569-573. doi:10.1111/J.1525-1497.2004.30137.X

395. Sambunjak D, Straus SE, Marusic A. A systematic review of qualitative research on the meaning and characteristics of mentoring in academic medicine. *J Gen Intern Med.* 2010;25(1):72-78. doi:10.1007/S11606-009-1165-8/TABLES/4
396. Straus SE, Chatur F, Taylor M. Issues in the mentor–mentee relationship in academic medicine: A qualitative study. *Acad Med.* 2009;84(1):135-139. doi:10.1097/ACM.0b013e31819301ab
397. Leslie K, Lingard L, Whyte S. Junior faculty experiences with informal mentoring. *Med Teach.* 2005;27(8):693-698. doi:10.1080/01421590500271217
398. Jackson VA, Palepu A, Szalacha L, Caswell C, Carr PL, Inui T. “Having the right chemistry”: a qualitative study of mentoring in academic medicine. *Acad Med.* 2003;78(3):328-334. doi:10.1097/00001888-200303000-00020
399. Rothwell C, Kehoe A, Farook DS, Illing PJ. The characteristics of effective clinical and peer supervision in the workplace: a rapid evidence review.
400. Hauer KE, Teherani A, Irby DM, Kerr KM, O’Sullivan PS. Approaches to medical student remediation after a comprehensive clinical skills examination. *Med Educ.* 2008;42(1):104-112. doi:10.1111/J.1365-2923.2007.02937.X
401. Binnie J. Structured Reflection on the Clinical Supervision of Supervisees With and Without a Core Mental Health Professional Background. <https://doi.org/103109/016128402011576325>. 2011;32(9):584-588. doi:10.3109/01612840.2011.576325
402. Allan H. Mentoring overseas nurses: barriers to effective and non-discriminatory mentoring practices. *Nurs Ethics.* 2010;17(5):603-613. doi:10.1177/0969733010368747
403. Beddoe L, Howard F. Interprofessional Supervision in Social Work and Psychology: Mandates and (Inter) Professional Relationships. <http://dx.doi.org/101080/073252232013730471>. 2012;31(2):178-202. doi:10.1080/07325223.2013.730471
404. Straus SE, Johnson MO, Marquez C, Feldman MD. Characteristics of successful and failed mentoring relationships: A qualitative study across two academic health centers. *Acad Med.* 2013;88(1):82-89. doi:10.1097/ACM.0b013e31827647a0
405. Yardley L. Dilemmas in qualitative health research. *Psychol Heal.* 2000;15(2):215-228. doi:10.1080/08870440008400302
406. Urrieta L. Figured worlds and education: An introduction to the special issue. *Urban Rev.*

- 2007;39(2):107-116. doi:10.1007/S11256-007-0051-0
407. Holland D, Jr WL, Skinner D, Cain C. *Identity and Agency in Cultural Worlds.*; 2001. <https://books.google.com/books?hl=en&lr=&id=flAp89A8r9gC&oi=fnd&pg=PP9&ots=98Q8I01mAS&sig=SXxFzOR3vF0HqxHQ5bHuNDHEsKQ>. Accessed November 4, 2021.
408. Pennings HJM, Hollenstein T. Teacher-Student Interactions and Teacher Interpersonal Styles: A State Space Grid Analysis. *J Exp Educ.* 2020;88(3):382-406. doi:10.1080/00220973.2019.1578724
409. Ross S, Cleland J, Macleod MJ, MJ M. Stress, debt and undergraduate medical student performance. *Med Educ.* 2006;40(6):584-589. doi:10.1111/j.1365-2929.2006.02448.x
410. Pisaniello MS, Asahina AT, Bacchi S, et al. Effect of medical student debt on mental health, academic performance and specialty choice: a systematic review. *BMJ Open.* 2019;9(7):e029980. doi:10.1136/BMJOPEN-2019-029980
411. Harvey A, Murphy D. Disadvantages faced by poorer medical students must be challenged. *BMJ.* 2019. <https://blogs.bmj.com/bmj/2019/11/14/disadvantages-faced-by-poorer-medical-students-must-be-challenged/>. Accessed March 2, 2022.
412. O'Callaghan J, Mohan HM, Sharrock A, et al. Cross-sectional study of the financial cost of training to the surgical trainee in the UK and Ireland. *BMJ Open.* 2017;7(11):e018086. doi:10.1136/BMJOPEN-2017-018086
413. Kumwenda B, Cleland J, Prescott G, Walker K, Johnston P. Relationship between sociodemographic factors and specialty destination of UK trainee doctors: a national cohort study. *BMJ Open.* 2019;9(3):e026961. doi:10.1136/BMJOPEN-2018-026961
414. Devlin M. Bridging socio-cultural incongruity: Conceptualising the success of students from low socio-economic status backgrounds in Australian higher education. *Stud High Educ.* 2013;38(6):939-949. doi:10.1080/03075079.2011.613991
415. Brosnan C, Southgate E, Outram S, et al. Experiences of medical students who are first in family to attend university. *Med Educ.* 2016;50(8):842-851. doi:10.1111/MEDU.12995
416. Shah R, Ahluwalia S. The challenges of understanding differential attainment in postgraduate medical education. *Br J Gen Pract.* 2019;69(686):426-427. doi:10.3399/BJGP19X705161
417. Abernethy AD. A mentoring program for underrepresented-minority students a... : Academic Medicine. *Academic medicine : journal of the Association of American Medical Colleges.*

- https://journals.lww.com/academicmedicine/Abstract/1999/04000/A_mentoring_program_f_or_underrepresented_minority.23.aspx. Published 1999. Accessed December 23, 2021.
418. Vaughan S, Sanders T, Crossley N, O’neill P, Wass V. Bridging the gap: the roles of social capital and ethnicity in medical student achievement. *Med Educ*. 2015;49:114-123. doi:10.1111/medu.12597
 419. Guevara JP, Wade R, Aysola JP. Racial and Ethnic Diversity at Medical Schools - Why Aren’t We There Yet? 2021. doi:10.1056/NEJMp2113023
 420. Rodríguez JE, Campbell KM, Pololi LH. Addressing disparities in academic medicine: What of the minority tax? *BMC Med Educ*. 2015;15(1):1-5. doi:10.1186/S12909-015-0290-9/FIGURES/1
 421. Kleiman M. *Hiring Wisdom: Top 10 Ways to Guarantee Your Best People Will Quit.*; 2013.
 422. Pololi L. In reply to Rodríguez and Campbell. *Acad Med*. 2013;88(11):1591-1592. doi:10.1097/01.acm.0000437283.53633.f9
 423. Jarus T, Liao P, Battalova A, et al. Policies as barriers for disabled medical learners: exploratory study of learners’ perspectives. <https://doi.org/101080/0968759920222041403>. February 2022:1-16. doi:10.1080/09687599.2022.2041403
 424. Burke PJ, Mcmanus J. Art for a few: exclusions and misrecognitions in higher education admissions practices. 2011. doi:10.1080/01596306.2011.620753
 425. Chan T, Sebok-Syer S, Thoma B, Wise A, Sherbino J, Pusic M. Learning Analytics in Medical Education Assessment: The Past, the Present, and the Future A CASE OF A CLINICAL COMPETENCY COMMITTEE (CCC) FILE REVIEW. *Comment Perspect*. 2018. doi:10.1002/aet2.10087
 426. Guyotte KW, Flint MA, Latopolski KS. Cartographies of belonging: mapping nomadic narratives of first-year students. *Crit Stud Educ*. 2021;62(5):543-558. doi:10.1080/17508487.2019.1657160
 427. Lea MR, Street B V. The “academic literacies” model: Theory and applications. *Theory Pract*. 2006;45(4):368-377. doi:10.1207/S15430421TIP4504_11
 428. Gale T. Expansion and equity in Australian higher education: three propositions for new relations. <http://dx.doi.org/101080/015963062011620751>. 2011;32(5):669-685. doi:10.1080/01596306.2011.620751

429. Gishen F, Lokugamage A. *Diversifying the Medical Curriculum*. Vol 364.; 2019.
<https://pubmed.ncbi.nlm.nih.gov/30674468/>. Accessed July 28, 2020.
430. Linton S. Taking the difference out of attainment. *BMJ*. 2020;368. doi:10.1136/BMJ.M438
431. Fyfe M, Horsburgh J, Blitz J, Chiavaroli N, Kumar S, Cleland J. The do's, don'ts and don't knows of redressing differential attainment related to race/ethnicity in medical schools. *Perspect Med Educ*. 2022;11(1):1-14. doi:10.1007/S40037-021-00696-3/TABLES/2
432. Dyrbye L, Eacker A, Durning S, et al. The Impact of Stigma and Personal Experiences on the Help-Seeking Behaviors of Medical Students With Burnout. *Acad Med*. 2015;90(7):961-969. doi:10.1097/ACM.0000000000000655
433. Lakew Y. Statistical Tales: Bringing in Reflexivity to Make Sense of Quantitative Data.
434. Greiffenhagen C, Mair M, Sharrock W. From Methodology to Methodography: A Study of Qualitative and Quantitative Reasoning in Practice. *Methodol Innov Online*. 2011;6(3):93-107. doi:10.4256/MIO.2011.009
435. Campbell JP, Deblois PB, Oblinger DG. "Academic Analytics: A New Tool for a New Era." 2007.
436. Holland C. Critical review: medical students' motivation after failure. *Adv Health Sci Educ Theory Pract*. 2016;21(3):695-710. doi:http://dx.doi.org/10.1007/s10459-015-9643-8
437. Saqr M, Fors U, Tedre M. How learning analytics can early predict under-achieving students in a blended medical education course. *Med Teach*. 2017;39(7):757-767. doi:10.1080/0142159X.2017.1309376
438. Searle NS, Thibault GE, Greenberg SB. Faculty development for medical educators: Current barriers and future directions. *Acad Med*. 2011;86(4):405-406. doi:10.1097/ACM.0B013E31820DC1B3
439. Klingenberg M, Gwozdz A, Gill D. The competitive environment in undergraduate medical education: Is it a barrier to becoming a "Good Doctor"? 2011.
https://www.researchgate.net/publication/259621659_The_competitive_environment_in_undergraduate_medical_education_Is_it_a_barrier_to_becoming_a_Good_Doctor/stats.
 Accessed March 18, 2022.
440. Crofts P. Studying medicine affected my mental health - Here's what i learnt. *BMJ*. 2020;370. doi:10.1136/BMJ.M3664
441. De Bruyn S, Wouters E, Ponnet K, Van Hal G. Popping smart pills in medical school: Are

- competition and stress associated with the misuse of prescription stimulants among students? <https://doi.org/10.1080/1082608420191572190>. 2019;54(7):1191-1202. doi:10.1080/10826084.2019.1572190
442. Cohen D, Winstanley S, Palmer P, et al. Factors that impact on medical student wellbeing--- Perspectives of risks Individual Support Programme. 2013.
443. Hinze SW. Gender and the body of medicine or at least some body parts: (Re)constructing the prestige hierarchy of medical specialties. *Sociol Q*. 1999;40(2):217-239. doi:10.1111/j.1533-8525.1999.tb00546.x
444. Norredam M, Album D. Prestige and its significance for medical specialties and diseases. doi:10.1080/14034940701362137
445. Creed PA, Searle J, Rogers ME. Medical specialty prestige and lifestyle preferences for medical students. *Soc Sci Med*. 2010;71(6):1084-1088. doi:10.1016/J.SOCSCIMED.2010.06.027
446. Anane M, SA C. An exploration of the implications of employment for medical students. A comparison of widening participation students to traditional entry students. *Abstr ASM 2019*.
447. García-Estañ J. Studying Medicine and being a doctor in Spain. *MedEdPublish*. 2018;7(4). doi:10.15694/MEP.2018.0000276.1
448. Lhuair M, Dramé M, Hivelin M, et al. Predictive factors of success at the French National Ranking Examination (NRE): a retrospective study of the student performance from a French medical school. *BMC Med Educ* 2019 191. 2019;19(1):1-13. doi:10.1186/S12909-019-1903-5
449. Ellis R, Scrimgeour DSG, Brennan PA, Lee AJ, Cleland J. Does performance at medical school predict success at the Intercollegiate Membership of the Royal College of Surgeons (MRCS) examination? A retrospective cohort study. *BMJ Open*. 2021;11(8):e046615. doi:10.1136/BMJOPEN-2020-046615
450. Patel A, Philip A. The Foundation Programme application: an alternative to the Situational Judgement Test. *Adv Med Educ Pract*. 2015;6(1):589. doi:10.2147/AMEP.S96186
451. GMC. Medical Licensing Assessment - GMC. <https://www.gmc-uk.org/education/medical-licensing-assessment>. Accessed March 21, 2022.
452. Noble ISG. Are national qualifying examinations a fair way to rank medical students? No. *BMJ*. 2008;337. doi:10.1136/BMJ.A1279

453. Devine OP, Harborne AC, McManus IC. Assessment at UK medical schools varies substantially in volume, type and intensity and correlates with postgraduate attainment. *BMC Med Educ* 2015 151. 2015;15(1):1-13. doi:10.1186/S12909-015-0428-9
454. Muijtjens AMM, Schuwirth LWT, Cohen-Schotanus J, Thoben AJNM, Vleuten CPMV Der. Benchmarking by cross-institutional comparison of student achievement in a progress test. *Med Educ*. 2008;42(1):82-88. doi:10.1111/J.1365-2923.2007.02896.X
455. Campbell M. A comprehensive guide to the Queensland Health intern recruitment program. Application Guide Intern2022 2.
456. Sam AH, Fung CY, Reed M, Hughes E, Meeran K. Time for preference-informed foundation allocation? *Clin Med (Northfield Il)*. 2022;22(6):590-593. doi:10.7861/CLINMED.2022-0198
457. Mruck K, Breuer F. Subjectivity and Reflexivity in Qualitative Research—The FQS Issues. *Forum Qual Sozialforsch / Forum Qual Soc Res*. 2003;4(2). doi:10.17169/FQS-4.2.696
458. Fletcher AJ. Applying critical realism in qualitative research: methodology meets method. *Int J Soc Res Methodol*. 2017;20(2):181-194. doi:10.1080/13645579.2016.1144401
459. D Devakumar SSGS. Racism, the public health crisis we can no longer ignore. *Lancet*. 2020;395:e112-3.
460. Krieger N. ENOUGH: COVID-19, structural racism, police brutality, plutocracy, climate change—And time for health justice, democratic governance, and an equitable, sustainable future. *Am J Public Heal*. 2020;110:1620-1623.

9 Appendix A – Scoping review – published format

Title

Understanding the impact of academic difficulties among medical students: a scoping review

Abstract

Background

Many medical students may encounter a range of academic and personal challenges during their course of study, but very little is known about their experiences. Our aim was to review the literature to inform future scholarship and to inform policy change.

Methodology

A scoping review was conducted searching PubMed, MEDLINE, EMBASE, PsycInfo, British Education Index, Web of Science and ERIC for English language primary research with no date limits. This retrieved 822 papers of which 8 met the requirements for inclusion in the review. Data were independently reviewed by two researchers and underwent thematic analysis by the research team.

Results

Three major themes emerged. Theme 1: 'Identity preservation' addressed students' aim to preserve their sense of self in the face of academic difficulty and their tendency to seek support. This connected the apprehension many students expressed about their educational institutions to the Theme 2: 'The dual role of the medical school' - medical schools are required to support struggling students, but are predominantly seen as a punitive structure acting as the gatekeeper to a successful career in medicine. Students' apprehension and attempts to protect their identities within this complex landscape often resulted in 'maladaptive coping strategies' (theme 3).

Conclusion

Understanding and exploring the academic challenges faced by medical students through their own experiences highlights the need for the development of more individualised remediation

strategies. Educators may need to do more to bridge the gap between students and institutions. There is a need to build trust and to work with students to enhance their sense of self and remediate approaches to engagement with learning, rather than focusing efforts on success in assessments and progression.

Introduction

On entering medical school, students have demonstrated their ability to meet demanding academic criteria. Yet many students encounter academic difficulties in which they are unable to meet the academic standards set for preclinical or clinical stages of the course. Attrition rates vary between 5-14%, and more students fail assessments but are supported to continue on the course.¹⁶⁻²⁰

Higher education and medical education research has focused on how best to predict academic outcomes, so as to inform admissions policies. However, it is important to explore how medical students make sense of their academic difficulties, because their beliefs about the causes of their difficulties influence how they engage with support processes and remediation programs. This scoping review synthesises the relevant literature.

Addressing academic difficulties early is important given the correlation between undergraduate underperformance and a greater risk of unprofessional behaviours, disciplinary proceedings, and fitness to practice hearings once qualified.²²⁻²⁵ Remediation practices vary across institutions, but typically provide additional support to students who have failed or are deemed to be 'at risk' of failure. However, they have been criticised for being generic, lacking in theoretical foundations, and having limited success.²¹

This situation could be improved by utilising the broader literature on academic performance and attrition across higher education, which has highlighted the importance of situational, institutional and dispositional factors.^{26,27} These are described in detail in Richardson et al.'s systematic review and meta-analysis.¹³ They analysed the theories underpinning the complex interplay between personality traits, motivational factors, goal setting, effort regulation (ability to maintain effort in the face of challenges), self-efficacy (belief in one's ability to complete tasks), and use of self-regulated learning (SRL) strategies to explain whether students attribute their academic performance to internal or external factors.³² Student approaches to learning (SAL) models further categorise learning strategies as 'deep' if they encompass critical analysis and information

synthesis, in comparison to ‘surface’ strategies such as memorisation, or ‘strategic’ strategies whereby students choose which approach to take depending on how they value the task.^{130–132}

Within medical education literature, there has been a specific focus on the academic, psychological, and social/contextual factors outlined below.

1) Academic Factors

Academic factors prior to medical school have mostly been investigated from the perspective of entry criteria and admissions scoring systems. The largest UK study on this topic identified a predictive link between prior academic achievement, progress through medical school, and performance in professional exams,²² although this has not always been replicated in smaller studies.^{42,56} Nonetheless, using pre-university exam performance to determine academic capacity is problematic, because factors such as social class and gender are determinants of academic outcomes independent of ability.⁴⁵ Furthermore, medical students who attended State schools academically outperform students who attended selective schools, despite similar results in final secondary school exams.¹⁰⁹ Studies assessing the predictive validity of aptitude tests have been inconclusive,^{40,56,57} and none show how they could be used to target support for at-risk students.

Important **academic factors at medical school** include the concepts of SRL and SAL,^{130–132,119,123,138} and the transition from pre-clinical learning to clinical practice. Berkhout et al. adapted the SAL model to medical education, exploring the journey from novice to experienced learners. They highlighted that experienced learners took control of their learning with more focused goals and efficient learning strategies.¹³⁹ The authors of a recent review of research into the transition to learning in the clinical environment cautioned against limiting the conceptualising of “transition” as ‘a maladaptive struggle’, and drew attention to the benefits of reframing it as a positive transformative experience.¹⁴⁰ Others have noted that academic struggles such as poor study habits or inadequate preparation for undergraduate study are more remediable than shortcomings in character, professionalism, or behavioural issues.³¹⁰

2) Psychological Factors

Studies investigating psychological factors have centred around stress, mental health and support.^{171,172} Research has revealed a high prevalence of distress among newly-qualified doctors, with many medical students experiencing substantial distress even prior to qualification.⁹ Also of

concern is the finding that medical students have lower distress scores compared to non-medical students on commencing medical school, but graduate with higher levels of depression and burnout.⁸ This appears to be a global issue,^{176–180} and must not be ignored by Western medical schools attempting to diversify their student intake: evidence suggests that international medical students experience more psychological distress than home students.¹⁸¹ Recent initiatives to improve the diversity of representation of health professionals with physical and learning disabilities have highlighted a need to ensure that appropriate adjustments and support are available to meet their specific needs.^{215,216}

3) Social/contextual Factors

Attrition models show that social, academic and institutional integration are strongly linked to course completion, whereas external pressures hamper this.^{116–118} Several studies have focused on the experiences of sub-groups of medical student that are under-represented in wider discussions of academic difficulties. These include mature students, students from ethnic minority backgrounds, LGBTQ+ students, and international students.^{184–187} Widening participation initiatives have been designed to increase the demographic breadth of medical school intakes, but this sub-group of students has higher attrition rates across university courses.³¹¹ Successful widening participation programmes may require appropriate curriculum and support systems to match student needs.^{113,114,312,313}

The scoping review reported here explored students' experiences of academic difficulties in relation to the various factors identified above.

Methods

The scoping review was conducted following the five stages described by Levac et al.:³¹⁴

1] Research question: What is known about borderline/failing medical students' experience of academic struggle, learning style, teaching and remediation?

2] Identifying relevant research: Table 1 lists the terms used for searches of MEDLINE, EMBASE, PsycInfo, Web of Science, British Education Index and ERIC databases on 15/12/2019 and re-run on 27/08/2020.

Table 8 Search terms

Database	Search Terms
EMBASE, MEDLINE	<p>Students, medical, undergraduate OR medical undergrad* Or Medical student*</p> <p>AND</p> <p>Student*adj12 borderline/strugg*/difficult*/distress*/fail*/adversity</p> <p>AND</p> <p>Student* adj9 experience/perception/sens*/feel*/impression/belief*/perspective/opinion*/narrative*/attitude*</p> <p>AND</p> <p>Learning style/learning technique or learning approach or learning method or learning practice OR</p> <p>Student* adj9 remediation/support OR Pastoral care/pastoral counselling OR medical adj3 curricul*/syllabus/program*/teach*</p>
PsycInfo, ERIC	<p>(Medical students or medicine students or students in medicine) OR medical undergraduates</p> <p>AND</p> <p>Borderline student OR struggling students OR difficulties OR failing students OR distress OR adversity</p> <p>AND</p> <p>(Experiences or perception or perceptions or experiences) OR (feelings or emotions or experiences or attitudes) OR (perspective or perception or opinion or experience or attitude) OR (views or opinions or perceptions or beliefs or attitudes or experience) OR (narrative OR sensation)</p> <p>AND</p>

	(learning styles and strategies) OR (learning practices OR (learning methods or teaching strategies) OR learning approaches OR Medical curriculum OR medical programs OR syllabus or medical teaching OR Remediation OR student support OR (pastoral care or pastoral counselling)
--	--

3] *Study selection*: The first two authors independently screened the articles using the three criteria outlined in Box 1. The use of the first criterion (population of interest) was progressively narrowed from all students at title review, to medical students at abstract review and finally academically struggling students at full text review to ensure that no relevant papers were overlooked at an early stage. Title review led to the exclusion of 484 articles, and 200 more were excluded at abstract review, leaving 84 papers for full text review. Agreement was reached for seven papers which were included in the review. The third author reviewed four papers where agreement was not reached. Of these, one met the criteria, so eight articles were included in the review. Study quality was assessed using the Mixed Methods Appraisal Tool. There was consensus across all eight studies between reviewers DK and GW; six were deemed high quality studies,^{173-175,276,316,317} two were low quality.^{260,318}

<p>SCREENING CRITERIA</p> <ol style="list-style-type: none"> 4. Population of interest – Academically struggling medical students 5. Measured student experience 6. About curriculum/teaching/learning/remediation/failure/support
<p>INCLUSION CRITERIA</p> <ul style="list-style-type: none"> • Published in English • Focused on academically struggling medical students (not qualified doctors, nor students or practitioners of other health professions) • Papers that focused on the medical students’ experience of failure, learning, teaching, attrition and support.
<p>EXCLUSION CRITERIA</p> <ul style="list-style-type: none"> • Articles without full text • Articles published in another language • Opinion pieces • Systematic reviews or review articles • Dissertations

Figure 9-1 Screening criteria and inclusion/exclusion criteria

4] *Data Extraction*: The first author developed a data extraction form, which included: study demographics; participant characteristics; data collection methods and analysis: definition of

academic struggle; what student experiences were explored; and the identified themes, recommendations, and quality control methods. The second author reviewed the full text articles against the data extraction to check for completeness and any discrepancies. This was an iterative process refined through discussion between all authors.

5] *Collating, summarising and reporting results*: Thematic analysis was conducted using Braun and Clarke’s 6-step approach : familiarisation with data; generating initial codes; searching for themes; reviewing themes; defining and naming themes; writing up analysis.³¹⁹ The first two authors independently reviewed the articles to generate initial codes which were then discussed to produce emergent themes. These were reviewed and refined via discussion with the third author.

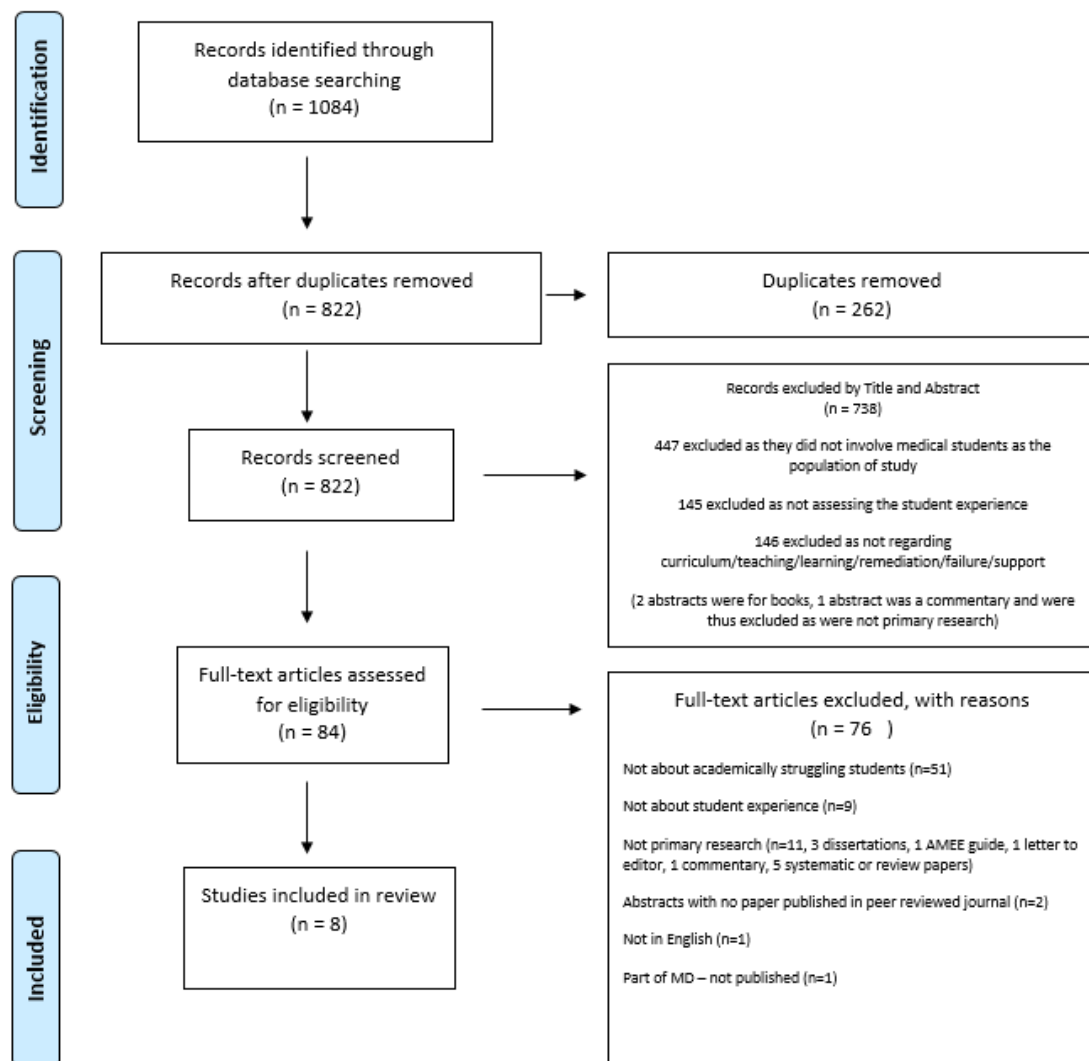


Figure 9-2 PRISMA summary flow diagram indicating the search and selection process

Results

Descriptive analysis

Eight studies published between 2002 and 2016 were included in the review: four from the UK,^{173-175,260} and one each from Ireland,³¹⁷ South Africa,³¹⁸ Dominica,²⁷⁶ and Pakistan.³¹⁶ One paper focused on first years,²⁷⁶ one on resitting second years,³¹⁸ and two on final year students.^{173,174} One paper looked across all year groups,³¹⁶ one at second to fourth years,³¹⁷ and two at fourth and fifth years.^{175,260}

Five studies used qualitative approaches;^{173-175,260,318} three used mixed-methods.^{276,316,317} Six studies used semi-structured interviews,^{173-175,260,276,317} of which one had an accompanying focus group,¹⁷⁴ one had a survey,²⁷⁶ and one had an evaluation questionnaire.²⁶⁰ The quantitative studies used an open survey,³¹⁸ or self-report scales.³¹⁶ Academic difficulty was defined in varied ways. Two studies used scoring systems as a descriptor of academic underperformance: the distance from the year average in continuous progress tests,³¹⁷ or absolute test scores.³¹⁶ Other defined academic difficulty in terms of failure of summative exams in the final year,^{173,174} or in earlier years.^{175,260,318} One study focused on failure of first semester exams, which automatically triggered student participation in remediation programmes.²⁷⁶

The studies focused on a broad range of student experiences, including motivation,^{175,260} type of curriculum,³¹⁸ learning habits,^{173,175,260,318} assessment modalities,^{173,174,260,317} and support/remediation.^{173-175,260,276,317} One study focused primarily on the interaction between stress and academic outcome,³¹⁶ and one focused on students' perceptions of the influence of teachers on their learning.²⁷⁶

There were diverse approaches to the topic of student experiences. Most had a narrow focus on the effect of specific issues related to student learning and academic outcomes, such as curricular change,³¹⁸ remediation programs,²⁶⁰ the impact of progress tests,³¹⁷ the role of teachers,²⁷⁶ or stress.³¹⁶ Patel's group took a more open and iterative approach in which the experiences explored were defined through semi-structured interviews and student narratives.^{173,174} Todres et al. took a similar approach, but compared high- and low-achieving students to identify differences in SAL.¹⁷⁵

Thematic analysis

Theme 1: Identity preservation

Academic difficulties affected students' identities and ideas of self-worth, which in turn influenced high stress levels and impaired mental health. Failure forced some students to confront their self-perception as academically successful students, and this was associated with a fear of being seen

as a failure by themselves and/or fellow students.¹⁷³ In attempts to protect against this, there was a tendency to adopt maladaptive coping strategies including misattributing and trivialising failure.¹⁷⁴

Withdrawal from their peers was common due to fears of being marginalised and not wanting to appear 'weak' in an environment perceived as competitive and hostile.^{174,316} In addition, students wanted to avoid being 'noticed' by the medical school,¹⁷⁴ and labelled as 'bad',¹⁷³ and so would not seek early support. These became barriers to changing their learning styles and approaches to assessment.¹⁷⁴ This inability or reluctance to self-analyse was further highlighted as a significant difference between 'high' and 'low' achieving students¹⁷⁵, with the latter unable to adapt their study styles, believing that effort alone would be rewarded with passing.

Interestingly, some students found that being interviewed for the studies provided an opportunity for self-reflection and behaviour change.¹⁷⁵ Other students were resistant to self-reflection even when confronted with failure: this group provides a greater challenge to remediation as they have a greater tendency to externalise the factors responsible for underachievement. Limitations to students' willingness or ability to self-reflect or self-regulate encompassed many of the above issues, and were reflected in the passive narrative that many struggling students used when describing their experiences.^{174,175}

Aspects of students' motives for studying medicine were also linked to issues of identity: 'high' achievers were motivated to study to develop their skills in preparation for their future role as a doctor, whereas 'low' achievers tended to be assessment-oriented, and more fixed in their identity as a student.¹⁷⁵

Theme 2: Medical schools' dual roles

Exploration of why students did not seek support through formal institutional processes revealed a recurring theme of distrust of the medical school and the relationship the students had with those placed to support them.

The school was often seen as both 'judge and jury',¹⁷³ positioned as gatekeeper to a successful career in medicine, yet also an intended source of support for the individual student to achieve their goal of becoming a doctor. Many students felt that the approach taken by the medical school was punitive and that remediation came too late, alongside the harmful effects of failing a significant exam^{173,174,260}. Students often used phrases such as 'frustration', 'bitterness', 'feeling let down', 'secondary prevention', and 'too little too late'.^{173,174,260}

Key attributes the students felt a good educator should possess were encouragement, motivation, honesty, and approachability, but also holding students accountable for their learning.²⁷⁶ A sub-theme linked to the role the medical school played in student experiences was the use and nature of feedback. In general, feedback was described as too generic to meet the needs of individual students.^{174,317} Feedback can be a useful tool to improve learning.^{320,321} However, if the delivery of feedback is poor, then it may be perceived as an unsupportive tick-box exercise that does not enhance student's self-esteem or confidence.^{174,317}

Another factor highlighted was the influence on students' study behaviours of the 'hidden' curriculum - the unspoken, implicit values, behaviours and norms that exist in the education setting,^{174,175,318} and the need for medical educators to have a good understanding of group study dynamics and methods.

Theme 3: Coping strategies and external pressures

The final theme related to how students cope with failure and their engagement with sources of support. Social isolation was not only a result of efforts to preserve self-identity, but also represented a lack of access to support - especially for graduate entrants, students transferring from other degree programmes, and international students.^{173,175}

Students found it easier to approach peers than personal tutors.^{174,175} However, Patel et al. cautioned against failing students working exclusively together, due to the risk of solidifying poor work practices and limiting opportunities to develop more adaptive learning styles: they called for the use of mentor schemes, alongside improving SRL, to combat this.¹⁷⁴

Availability of time for study may be affected by financial hardship (necessitating the need for paid work), bereavement, relationship breakdown, mental health difficulties and subsequent treatment.^{173,175,260} Although personal problems are not unique to failing students, the difference in the way the students responded to them was pronounced. High achievers tended to use these challenges as motivators to focus their studies and succeed, whereas low achievers attributed their failure to such challenges.¹⁷⁵ To compound this, students' belief that their medical school would not consider personal problems a legitimate reason for failure resulted in delayed help-seeking.¹⁷³

Discussion

The causes of student academic underperformance and failure are complex, varied and individual. This is why it is important for institutions to understand how students explain and respond to academic difficulties when creating policies to support them.

Predicting which students are likely to face academic difficulty remains a struggle, especially as institutions attempt to diversify their intakes. The data presented here suggest that medical schools may need to consider evaluating students' abilities to self-reflect and self-regulate as part of the admissions process. These are essential skills for lifelong learning, and they should be integrated much earlier in students' educational journeys.^{265,322}

However, many of the influences on academic difficulties arise during students' time at medical school: they cannot be predicted through admissions processes, and require support processes able to mitigate their effects. Institutions must act in ways that acknowledge that the ability to meet demanding academic entry requirements does not protect students from academic

difficulties, and that for many students this will be their first experience of such difficulties. We have shown how this can have profound impacts on identity, and act as a barrier to accessing formal or informal support. It may help students if medical schools explicitly addressed the issue, explaining to students that such difficulties are not unusual. Sessions designed to help students develop practical and psychological skills may create an environment in which students are less fearful of being stigmatised and more open to addressing their needs.

For students who do require more support, we encourage institutions to aim for individualised remediation, but note that this may be resource-intensive.²⁶⁰ Finding the allocated time within the curriculum and the staff members to provide this level of support may not be feasible for many institutions. Therefore, support should be aimed at addressing the strongest modifiable correlates of tertiary academic performance: past research has identified a complex mix of self-efficacy, effort regulation, goal setting and integration.^{32,127}

Some students felt that remediation opportunities occurred too late.³¹⁷ This may be prevented via formative assessments and predictive assessment models to enable earlier identification of at-risk students.³¹⁷ Further research to assess whether early identification is feasible at a multi-institutional and national scale is required. However, institutions should note that students deemed these more useful to the institution than their learning, and often interpreted them as the medical school 'policing' them. Additionally, there is some concern that data-driven approaches to learning risk simplifying the complex nuances of human processes and ignoring social contextual factors.⁶⁹ Transparency regarding the reasons for these procedures, and better individual feedback mechanisms within this testing may help students to recognise the value of formative assessments. Research into students' perspectives on formative assessment and actionable feedback may improve how these tests are applied and improve engagement.

For many students in the studies reviewed here, discussions with the researchers was the first opportunity to reflect on their experiences and learning, and many reported that it was therapeutic.^{173,175} Utilising this, institutions could integrate sessions that encourage students to reflect and challenge their current approaches to learning, facilitated by trained educators capable of teaching SRL strategies.^{119,323,324} This could boost self-efficacy, and thereby help students to cope better with personal problems.^{173,263}

Finally, to address the preference of students to seek support among their peers it is worth exploring whether the benefits of near-peer teaching involving senior students teaching and mentoring more junior colleagues translates to near-peer support.³²⁵ This might appeal to failing students who are reluctant to use formal support pathways due to fears of institutional


surveillance and punitive consequences. This may be of particular benefit to traditionally underrepresented students who struggle to integrate,³²⁶ but this is an area that requires more research.

Limitations and opportunities

Although our review sampled articles across a wide range of institutions and considered differing cultural perspectives to learning and education, it did not include non-English language articles. This potentially excluded relevant studies from other countries in which struggling students may be conceptualised differently and/or where different remediation practices are employed. Additional databases could have been included, but they were unlikely to have yielded more studies given the focus on medical undergraduates and the unique demands of the course, but parallels could be drawn by examining literature in other healthcare courses. This scoping review only found a handful of studies of the experiences of academically struggling medical students: there is a clear need for more research. Struggling students were generally identified after having failed an examination, but this may not be the only marker of academic difficulties. Future quantitative and qualitative research focused on students in the lower quartiles of exam results – but who still pass – could reveal how widespread these issues are.

Future research to determine the predictive validity of assessment of approaches to learning and formative assessments may reveal better ways to identify students who would benefit from early remediation. This may prompt personal tutors to open discussions to explore students' experiences, and to identify areas of support that may allow for earlier remediation.

9.1 Appendix B – Ethical approval for the retrospective cohort analysis



BSMS Research Governance Ethics Committee

Certificate of Approval	
Reference Number	ER/BSMS9H3Z/1
Title Of Project	What defines medical students who place within the lower quartile of academic performance, and how can their lived experiences inform support within medical curricula?
Principal Investigator (PI):	David Kirtchuk
Student	N/A
Collaborators	Tom Levett, Clare Casteldine, Richard de Visser, Richard Fuller (Leeds Medical School)
Date Of Approval	07-Jul-2020
Approval Expiry Date	05-Jul-2022
RGEC Chair	Prof Valerie Jenkins
Name of Authorised Signatory	Caroline Brooks
Date	07-Jul-2020

The Brighton and Sussex Medical School Research Governance and Ethics Committee (RGEC) has assessed your application and granted Ethical and Research Governance Approval to proceed with the above named project.

Approval is granted on the following basis:

Duration of Approval

Approval covers the period stated above. Research must commence within 12 months of the certificate start date; any delay beyond 12 months and this certificate of approval will lapse necessitating renewed review of the project.

Project Amendments

Any substantial changes or minor amendments to the project following issue of the certificate of approval should be submitted to the Research Governance and Ethics Committee for review and authorisation prior to implementation. Please submit your application for an amendment to the Committee (via rgec@bsms.ac.uk) using the Request for an Amendment Form.

Reporting Adverse and Unexpected Events

Any incidents occurring during the project's lifespan presenting ethical and safety implications must be reported immediately to the Chair of the Research Governance and Ethics Committee. In the event of an adverse (undesirable and unintended) and unexpected event occurring during the project, research must be stopped immediately and events reported to the Chair of the Research Governance and Ethics Committee within 24 hours of its occurrence.

Monitoring

The Medical School has a duty to ensure all its research is conducted in accordance with the University of Sussex's Code of Practice for Research and Research Governance and Ethical Review Framework. In order to ensure compliance auditing may be undertaken annually and /or periodic monitoring of a percentage of approved research studies. If your project is selected you will be given 4 weeks' notice to prepare all study documentation for inspection.

Notification of End of Study

Please notify the Research Governance and Ethics Committee once the study has completed. It is also your responsibility to inform the Committee in the event of early termination of the project or if the work is not completed.

7/7/2020

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9.2 Appendix C – Table of assessment variables

<u>Variable Name</u>	<u>Type of Variable</u>	<u>Dichotomised</u>
Attendance 101	Categorical - Nominal	Pass = 0 Fail = 1
Attendance primary care placement 101	Categorical - Nominal	Pass = 0 Fail = 1
Portfolio score 101	Numeric	
Portfolio grade 101	Categorical	Pass/Merit/Distinction = 0 Fail = 1
Family study score 101	Numeric	
Family study grade 101	Categorical	Pass/Merit/Distinction = 0 Fail = 1
Overall Module Grade (OMG) 101	Categorical	Pass/Merit/Distinction = 0 Fail = 1
Attendance 102	Categorical	Pass = 0 Fail = 1
Academic skills grade 102	Categorical	Pass/Merit/Distinction = 0 Fail = 1
Module essay grade 102	Categorical - Nominal	Pass/Merit/Distinction = 0 Fail = 1

Knowledge test (KT) 102	Numeric	
KT grade 102	Categorical - Nominal	Pass/Merit/Distinction = 0 Fail = 1
OMG 102	Categorical - Nominal	Pass/Merit/Distinction = 0 Fail = 1
Attendance 103	Categorical – Nominal	Pass = 0 Fail = 1
SSC Grade 103	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Module tutorial score 103	Numeric	
Module tutorial grade 103	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
SBA 103	Numeric	
SAQ 103	Numeric	
KT 103	Numeric	
KT grade 103	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Weighted overall 103	Numeric	
OMG 103	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1

Attendance 104	Categorical – Nominal	Pass = 0 Fail = 1
SSC grade 104	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Module tutorial test 104	Numeric	
Module tutorial grade 104	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
SBA 104	Numeric	
SAQ 104	Numeric	
KT 104	Numeric	
KT grade 104	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Weighted overall 104	Numeric	
OMG 104	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Attendance 201	Categorical – Nominal	Pass = 0 Fail = 1
Attendance primary care placement 201	Categorical – Nominal	Pass = 0 Fail = 1

OSCE score 201	Numeric	
OSCE grade 201	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Portfolio score 201	Numeric	
Portfolio grade 201	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Patient study score 201	Numeric	
Patient study grade 201	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
OMG 201	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Attendance 202	Categorical – Nominal	Pass = 0 Fail = 1
SSC grade 202	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Case study score 202	Numeric	
Case study grade 202	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
SBA 202	Numeric	
SAQ 202	Numeric	

KT 202	Numeric	
KT grade 202	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Weighted Overall 202	Numeric	
OMG 202	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Attendance 203	Categorical – Nominal	Pass = 0 Fail = 1
SSC grade 203	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Patient info leaflet grade 203	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
KT 203	Numeric	
KT grade 203	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
OMG 203	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Attendance 204	Categorical – Nominal	Pass = 0 Fail = 1

SSC grade 204	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Poster grade 204	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
KT 204	Numeric	
KT grade 204	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
OMG 204	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
OSCE score year 3	Numeric	
OSCE grade year 3	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Attendance 301	Categorical – Nominal	Pass = 0 Fail = 1
OMG 301	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Essay score 1 302	Numeric	
Essay score 2 302	Numeric	
Essay score 3 302	Numeric	

Essay score overall 302	Numeric	
Exam 302	Numeric	
Logbook attendance 303	Categorical – Nominal	Pass = 0 Fail = 1
CBD grade 303	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
CBD score 303	Numeric	
KT 303	Numeric	
KT grade 303	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
OMG 303	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Logbook 304	Categorical – Nominal	Pass = 0 Fail = 1
CBD grade 304	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
CBD score 304	Numeric	
KT 304	Numeric	

KT grade 304	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
OMG 304	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Not applicable		
Logbook 306	Categorical – Nominal	Pass = 0 Fail = 1
Elderly Medicine CbD grade 306	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Elderly Medicine CbD score 306	Numeric	
Psychiatry CbD grade 306	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Psychiatry CbD score 306	Numeric	
KT 306	Numeric	
KT grade 306	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
OMG 306	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
SSC 1 307	Categorical – Nominal	Pass/Merit/Distinction = 0

		Fail = 1
SSC 2 307	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
SSC poster grade 307	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
SSC overall 307	Numeric	
Clinical Pharmacology 308	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
KT score year 3	Numeric	
KT grade year 3	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Time for Dementia	Categorical – Nominal	Pass/Merit/Distinction = 0 Fail = 1
Attendance Failure year 1-3	Categorical – Nominal	None=0 Any= 1
Year1/2 OSCE Failure	Categorical - Nominal	None=0 Any= 1
Year 1/2 KT Failure	Categorical – Nominal None=0	None=0 Any= 1

	One=1	
	Two=2	
	Three=3	
CbD Failure	Categorical –	None=0
	Nominal	Any=1
	None=0	
	One=1	
	Two=2	
	Four=3	

9.3 Appendix D – Ethical approval for the IPA study

Certificate of Approval	
Reference Number	ER/BSMS9H3Z/2
Title Of Project	What defines medical students who place within the lower quartile of academic performance, and how can their lived experiences inform support within medical curricula? Qualitative study
Principal Investigator (PI):	David Kirtchuk
Student	N/A
Collaborators	Supervisors: Clare Casteldine, Tom Levett, Richard De Visser, Richard Fuller.
Date Of Approval	02-Nov-2020
Approval Expiry Date	04-Mar-2022
RGEC Chair	Prof Valerie Jenkins
Name of Authorised Signatory	Caroline Brooks
Date	02-Nov-2020
<p>The Brighton and Sussex Medical School Research Governance and Ethics Committee (RGEC) has assessed your application and granted Ethical and Research Governance Approval to proceed with the above named project.</p> <p>Approval is granted on the following basis:</p> <p>Duration of Approval</p> <p>Approval covers the period stated above. Research must commence within 12 months of the certificate start date; any delay beyond 12 months and this certificate of approval will lapse necessitating renewed review of the project.</p> <p>Project Amendments</p> <p>Any substantial changes or minor amendments to the project following issue of the certificate of approval should be submitted to the Research Governance and Ethics Committee for review and authorisation prior to implementation. Please submit your application for an amendment to the Committee (via rgec@bsms.ac.uk) using the Request for an Amendment Form.</p> <p>Reporting Adverse and Unexpected Events</p> <p>Any incidents occurring during the project's lifespan presenting ethical and safety implications must be reported immediately to the Chair of the Research Governance and Ethics Committee. In the event of an adverse (undesirable and unintended) and unexpected event occurring during the project, research must be stopped immediately and events reported to the Chair of the Research Governance and Ethics Committee within 24 hours of its occurrence.</p> <p>Monitoring</p> <p>The Medical School has a duty to ensure all its research is conducted in accordance with the University of Sussex's Code of Practice for Research and Research Governance and Ethical Review Framework. In order to ensure compliance auditing may be undertaken annually and /or periodic monitoring of a percentage of approved research studies. If your project is selected you will be given 4 weeks' notice to prepare all study documentation for inspection.</p> <p>Notification of End of Study</p> <p>Please notify the Research Governance and Ethics Committee once the study has completed. It is also your responsibility to inform the Committee in the event of early termination of the project or if the work is not completed.</p>	

9.4 Appendix E – Participant Information Sheet for IPA study

Study title

How do students make sense of their experiences at medical school and attribute the causes of their academic difficulties? – An IPA analysis

Invitation paragraph

You are being invited to take part in a research study as part of a doctorate in medical education. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Ask us if there is anything that is not clear or if you would like more information.

What is the purpose of the study?

The aim of this project is to investigate whether certain factors predict a student's performance at the end of third year of the medical degree. These factors include personal characteristics (sex), how you performed on tests used in the admission process to medical school, assessments within medical school, as well as individual factors occurring during medical school. Our focus will be students placing in the lower 30% of exam results of the end of third year exams.

We aim to explore these factors in more detail to create a narrative (story) of student experiences of assessment, teaching, learning and support to inform and drive change in these areas for future medical students.

Why have I been invited to participate?

Individuals will be invited to take part in the project on the basis of scoring in the lower 30% of students in the end of third year assessment. We will be inviting up to 20 students to take part in the study.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. There will be no impact on your marks, assessment of future studies should you choose to either take part or not take part in the study.

What will happen to me if I take part?

You will be invited to take part in an interview that will last up to a maximum of 90 minutes. This will explore your experiences of assessment, learning, teaching and support at Brighton and Sussex Medical School (BSMS). The interview will be undertaken on Microsoft Teams and audio recorded using a Dictaphone and typed up word for word. You will have the opportunity to review what was said during the interview. On completion of the study, you will be sent a summary of the findings.

What are the possible disadvantages and risks of taking part? (where appropriate)

Though we do not anticipate there being any risks by taking part in the study we understand that discussing issues around your experience at medical school may be upsetting to some people. Interviews will be carried out online and as always you will have access to student support services should you find any of the questions distressing.

What are the possible benefits of taking part?

There is no benefit to you personally by taking part in this study. We hope that the findings of the study will help make improvements to the way we teach and assess students at BSMS in the future.

Will my information in this study be kept confidential?

All the information that we collect about you during the course of the project will be kept strictly confidential.

We will use a different name to identify you in the study (pseudonym). You will not be identified by your age, gender or ethnicity in reports. Audio and word files will be stored online using University systems, this will be deleted once the interview has been written out. Once the interview has been written out you will have the opportunity to review it (7 days) should you wish. This will be password protected and only accessible to the research team.

If you wish to raise a complaint on how we have handled your personal data, you can contact University of Sussex Information Team at GDPR@sussex.ac.uk or the University of Brighton Data Compliance & Records Management Team at: dataprotection@brighton.ac.uk.

What should I do if I want to take part?

If you wish to take part in the study please reply by email to Dr David Kirtchuk at d.kirtchuk@bsms.ac.uk. If you wish to join the study, the researcher will take you through this information sheet and you will be asked to sign a consent form. These forms will be stored in a locked BSMS office.

What will happen to the results of the research study?

Results of the research will be used to write a thesis in medical education. We plan to publish the results in journals. You will not be identified in any report or publication. We will keep the data for five years after collection. Audio and video files will be deleted after transcription.

Who is organising and funding the research?

This research is funded by a Health Education England (Kent, Surrey, Sussex) Foundations in Generalism grant.

INSURANCE

The University of Sussex has insurance in place to cover its legal liabilities in respect of this study.

Who has approved this study?

The research has been approved by the Brighton and Sussex Medical School Research Governance and Ethics Committee (RGEC). (Ethical review application number: ER/AA01/1)**

Contact for Further Information

Dr David Kirtchuk, Research Fellow BSMS, Watson 344a, Falmer Campus, Brighton BN1 9PH.

Tel +44(0)1273696955 (ext 64245)

Email: d.kirtchuk@bsms.ac.uk

9.5 Appendix F – Consent form for IPA study

CONSENT FORM FOR PROJECT PARTICIPANTS

Title of Project: How do students make sense of their experiences at medical school and attribute the causes of their academic difficulties? – An IPA analysis

Name of Researcher and School: Dr David Kirtchuk, Research Fellow at Brighton and Sussex Medical School

RGEC Ref no:

Please initial box

- | | YES | NO |
|---|--------------------------|--------------------------|
| • I consent to being interviewed by the primary researcher | <input type="checkbox"/> | <input type="checkbox"/> |
| • I agree to allowing the interview to be audio-recorded | <input type="checkbox"/> | <input type="checkbox"/> |
| • I understand that I will be given a typed copy of the interview for me to review before being included in the write up of the research | <input type="checkbox"/> | <input type="checkbox"/> |
| • I consent to the use of anonymised quotes in publications arising from the research. | <input type="checkbox"/> | <input type="checkbox"/> |
| • I understand that any information I provide is confidential, and that no information that I disclose will lead to the identification of any individual in the reports on the project, either by the researcher or by any other party | <input type="checkbox"/> | <input type="checkbox"/> |
| • I have read the information sheet, had the opportunity to ask questions and I understand the principles, procedures and possible risks involved. | <input type="checkbox"/> | <input type="checkbox"/> |
| • I consent to the processing of my personal information and data for the purposes of this research study. I understand that such information will be treated as strictly confidential and handled in accordance with the General Data Protection Regulation (GDPR) 2016. | <input type="checkbox"/> | <input type="checkbox"/> |

- I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage prior to the data being unpaired, as noted in the participant information sheet, without being penalised or disadvantaged in any way.
- I agree to take part in the above Brighton and Sussex Medical School (BSMS) research project

Name of participant:	_____
Signature of participant	_____
Date:	

Name of researcher:	_____
Signature of researcher	_____
Date:	

9.6 Appendix G - Interview topic guide for IPA study

Opening questions (motivation)

- What led you to apply for medical school?
- What motivates you to become a doctor?
- Have any of these changed throughout the course?

Curriculum and learning styles

- What aspects of the curriculum have you enjoyed?
- What aspects have been more challenging and why? Are there any aspects of the curriculum you do not feel should be a part of the course?
- How have you found the change to predominantly learning in the clinical environment?
- Are there any particular challenges you have faced with this transition?
 - If they answer yes - how did you address them?
- How have your study habits changed during medical school?
- Would there have been anything that could have helped with this transition?
- Which aspects of the course in the first 2 years helped you prepare for this transition?

Assessment, ranking and feedback

- How have you found the assessments at BSMS? (frequency, challenging, have they helped focus your learning?)
- What do you think of the formative assessments? How do you approach them compared to the end of year exams? How has the feedback been delivered and how does that impact you?
- How do you feel about the summative exams at BSMS? How do you prepare/revise? What techniques do you use? Do you prefer to study alone or with peers? How have you felt after the assessments?
- Have you ever failed or struggled with any assessments if so what happened and how did that make you feel? How did you find the medical schools response? What support if any were you offered? What helped and what didn't?
- How do you feel about the ranking system at medical school? In what way does it impact the way to prepare for and view the assessments? What do you think the purpose of the ranking system is? Do you find it beneficial or detrimental and if so why? How do students discuss the ranking?
- What sort of feedback have you received during the course? Overall how has the feedback affected you? Can you remember any particularly good experiences with feedback and any bad ones, what made them helpful or not?

Support/remediation

- What support structures if any have you accessed at medical school?
- Is it clear to you how to access support? Are there any reasons you didn't access support or wouldn't now or in the future? How do you think this compares to other students?
- What if any aspects of support did you find beneficial or unhelpful?
- Do you have any advice in how support systems at the university could be changed to be more helpful in future?

Social Interaction/personal problems/Medical school environment and role

- How have you found the environment at medical school? Are there any barriers to socialising amongst your peers? Is there anything you would change regarding this? Have you ever been made to feel excluded?
- Has there been anything outside of medical school that has impacted you during the course?
 - Yes - What has helped you manage them? Have you made the medical school aware, if so was this easy and what was their response? Was it helpful? If not, Why?
- How do you feel about how the medical school treats the students?

Wind-down:

Are there any questions you have for me?

Is there anything we haven't covered in the interview that you would like to discuss?

Are there any questions you thought I would ask but I did not?

Are there any questions you were surprised that I asked?

In what ways do you think this would have been different if I had been a medical school faculty member? older? female? etc.

9.7 Appendix H - Recruitment Email for IPA study

This email is circulating to invite students to participate in the following study.

We are interested in interviewing up to a maximum of 20 students to explore your experiences at the medical school. We are interested in a range of aspects of the course including your experiences of assessment, teaching, learning and support. We hope to be able to use the findings to inform and improve support to all future students at BSMS.

The interview will be undertaken by the primary researcher via Microsoft teams and audio recorded on an external device and last a maximum of 90 minutes. It will occur during term hours at a time that suits you.

Given we are interested in whether academic performance is impacted by these experiences we are planning to interview students who placed within the lower 30% of students at the end of third year exams.

Involvement in this study is on a purely voluntary basis and there will be no effect on future marks or assessment scores whether you choose to participate or not. The research team will not be aware of your previous assessment scores or ranking position.

We appreciate you taking the time to read this email and value your contribution should you wish to take part. Should you be interested in being involved in the study please contact the primary researcher (David) at the following email address; d.kirtchuk@bsms.ac.uk

Notes for use

[to be removed before submission for review]

Statements given in *italics* will tend to be optional depending on the type of study. Statements in normal type are almost certainly needed for all studies either as they stand or with small amendments. **The number of statements can be increased or reduced according to the study's needs.**

Researchers should keep in mind that use of the consent form serves two important and closely linked principles:

Firstly, a fundamental principle of ethical research is that **participation and consent is voluntary and informed**. Instances in which the real reason for participation is initially 'masked' from individuals (such as is employed in Psychology or other disciplines) will be subject to discipline-based conventions or conditions that will be spelled out to the reviewing Ethics Committee at review stage.

Secondly, the storing and **processing of any personal data for research purposes is subject to legal requirements** (such as the *General Data Processing Regulation 2016*) that researchers need to understand and follow. This legislation expects that participants who give consent for their data to be used understand how it will be stored, processed and eventually destroyed¹. If the data is deemed to be *Special Category Data*², there are more stringent requirements for safeguarding what will be processed to avoid breaching fundamental data rights. Applicants should seek appropriate advice and guidance if they have any doubts about their responsibilities.

¹"any freely given, specific, informed and unambiguous indication of the data subject's wishes by which he or she, by a statement or by a clear affirmative action, signifies agreement to the processing of personal data relating to him or her" , GDPR Article 4.

²Data relating to race, ethnic origin, politics, religion, trade union membership, genetics, biometrics (where used for ID purposes),health, sex life, or sexual orientation.

- All requests for consent should be **specific**³, **unambiguous** and **informed**. All statements above that do not apply to the research should be removed. Studies that require different data types to be taken or use different media within the same project should take care that consent is granular whenever possible.
- In some fields of research, it could be helpful to re-use the data for future research and analysis. If it is likely that your data is of this kind and you want to have the option to use the data for other purposes, or for it to be available to other researchers, you must obtain **explicit** permission and describe what you want the participant to agree to in the Explanatory Statement.
- Where necessary a statement should be included for the participant/s to agree that the information provided can be used in further research projects which have research governance approval as long as their name, personal identifiable details and contact information is removed before it is passed on. State *exactly* what the consent that you are seeking.
- If the study involves the possible disclosure of information (either in focus groups, one to one interviews or through being passed on in any other forms of communication), the duty to pass on information that may have a bearing on the safety of others (for example in the context of possible terrorism or safe-guarding concerns) will require that the consent form references this.
- Verbal consent may be used in circumstances where written consent would be inappropriate. Researchers will still need to use mechanisms and techniques that record or attest that there has been appropriate informed consent.
- Where there is a relationship between the participant and the researcher which might be deemed to unduly influence the participant's voluntary consent, space for an independent witness (name, signature and date) should be added, preceded by '*I believe that* *(name) understands the above project and gives his/her consent voluntarily.*'

NOTE ON MODIFICATION OF THE TEMPLATE

Each of the consent statements is within a table that has had the borders hidden within the Word application.

To add or remove lines it may be easier to restore the borders to see the table and then remove again when the amendments have been completed.

³ GDPR recital 32 states that silence, pre-ticked consent boxes or assumptions of consent will **not** be considered valid for processing data.



Further information and guidance on research ethics and governance can be found at

