

PHYSIOTHERAPISTS' PERCEPTIONS OF CONTRIBUTORY AND RISK
REDUCTION FACTORS FOR WORK-RELATED SPINAL DISORDERS IN
THE PROFESSION IN WALES

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Abstract

Physiotherapists' perceptions of contributory and risk reduction factors for work-related spinal disorders in the profession in Wales

The prevalence rate of work-related spinal disorders in physiotherapists in a variety of clinical and geographical areas is approximately 35% and has not altered significantly over the last three decades. Previous evidence identifies physical and environmental factors which increase the risk of work-related spinal disorders and opportunities for risk reduction. There is a paucity of qualitative evidence from physiotherapists regarding their own perceptions of these issues. The purpose of this study was to explore the perceptions of practising physiotherapists in order to develop a theory regarding perceived contributory and risk reduction factors for work-related spinal disorders in the physiotherapy profession.

The study used a constructivist grounded theory methodology using semi-structured interviews as the method. Participants, who met the inclusion criteria, were purposively recruited from physiotherapists in an NHS Health Board in South Wales. Two pilot interviews were conducted and were videoed for training purposes; fourteen further participants were recruited from the purposive sample, three were randomly selected and eleven were theoretical sampled directed by the data analysis. All interviews were audio-recorded, transcribed and thematically coded. The participants' profile consisted of twelve females and four males with an age range between 24 to 57 years, representing NHS career bands 5 to 8b and varied over a number of clinical speciality areas. Data analysis commenced via line-by-line coding followed by initial coding. This coding directed further data requirements by focusing data collection and theoretical participant recruitment and was iterative in nature. Secondary coding and focused coding synthesised the initial codes by grouping them into themes. In total, three themes emerged regarding contributory and risk reduction factors for work-related spinal disorders – The Institution, The Job and The Individual. Each theme incorporated factors and sub-factors.

Some of the key findings supported previous evidence especially around physiotherapy practice as a contributory factor. However, a number of factors emerged from the data which have not previously been reported and centred on the impact of the institution, the effect of team working, personal responsibility particularly with reference to personal fitness for the job and physiotherapists' attitude towards and implementation of manual handling training and risk assessment.

From the three key themes further abstraction resulted in the creation of a grounded theory identified as the Mixer Theory for Contributory and Risk Reduction Factors for Work-related Spinal Disorders in the Physiotherapy Profession involving four constructs - Knowledge, Loyalty, Infallibility and Responsibility.

The recognition and understanding of the Mixer Theory developed from the findings will raise awareness to enhance the future safety of physiotherapists. Its validity could be tested for use in different NHS Trusts and other therapy professions.

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Acronyms

AWTHG	All Wales Treatment Handling Group
AWOPG	All Wales Occupational Health Physiotherapy Group
BERA	British Education Research Association
BMA	British Medical Association
BP	Back pain
CDC	Centers for Disease Control and Prevention
CGT	Constructivist Grounded Theory
CIPD	Chartered Institute of Personnel and Development
CPD	Continuing professional development
CSP	Chartered Society of Physiotherapy
ESP	Extended Scope Practitioner
ESRC	Economic and Social Research Council
EU	European Union
FREGC	Faculty Research Ethics and Governance Committee
GB	Great Britain
HASAWA	Health and Safety at Work Act 1974
HCPC	Health and Care Professions Council
HPC	Health Professions Council
HEI	Higher Education Institute
HSE	Health and Safety Executive
IOSH	Institute of Occupational Safety and Health
IRAS	Integrated Research Approval System
LBP	Low back pain

LHB	Local Health Board
LOLER	Lifting Operations and Lifting Equipment Regulations 1998
MHOR	Manual Handling Operations Regulations 1992
MHSWR	Management of Health and Safety at Work Regulations 1999
N	Newton
NCRM	National Centre for Research Methods
NHS	National Health Service
NIOSH	National Institute of Occupational Safety and Health
NISCHR	National Institute of Social Care and Health Research
OSHA	Occupational Safety and Health Administration (European Agency for Safety and Health)
PCP	Permissions Co-ordinating Process
PIS	Participant Information Sheet
PRF	Physiotherapy Research Fund
PUWER	Provision and Use of Work Equipment Regulations 1998
R&D	Research and Development
REC	Research Ethics Committee
RIDDOR	Reporting of Injuries, Diseases and Dangerous Occurrences Regulation 1995
RPA	Research Plan Approval
SWA	Safe Work Australia
UHB	University Health Board
UK	United Kingdom
USA	United States of America
WAG	Welsh Assembly Government

WG	Welsh Government
WHO	World Health Organisation
WLBP	Work-related low back pain
WMSD	Work-related musculoskeletal disorder
WSD	Work-related spinal disorder

Definitions

Manual handling operation

Transporting or supporting a load (including lifting, putting down, pushing, pulling, carrying or moving thereof) by hand or bodily force

Physiotherapy

Physiotherapy in the UK is an autonomous healthcare profession which combines knowledge, skills and attitudes to assist people to optimize their movement, to achieve the fullest possible physical and psychosocial function through the use of a range of physical and electrical modalities

Therapeutic handling

The individual is encouraged, guided and facilitated to move, in order to regain postural control and selective movement, and to learn functional motor skills.

Guiding, facilitating, manipulating, stretching or providing resistance

Work-related spinal disorder WSD

Injury, damage or dysfunction involving the spinal column (cervical, thoracic, lumbar and pelvis), caused by, or aggravated by work. It may or may not involve a specific incident, be insidious, or intermittent, constant or episodic, frequent or infrequent, mild or severe

Work-related musculoskeletal disorder WMSD

Impairments of the bodily structures, such as muscles, joints, tendons, ligaments and nerves, which are caused or aggravated primarily by the performance of work and by the effects of the immediate environment in which work is carried out

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Declaration

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:

A handwritten signature in black ink, appearing to read 'D. P. Coe', with a horizontal line underneath.

Dated: 30.3.17

1 Introduction

This study followed an interpretive qualitative research paradigm, using a constructivist grounded theory approach to explore the perceptions of physiotherapists, working within a National Health Service Health Board in South Wales, in relation to the contributory and risk reduction factors for work-related spinal disorders within the physiotherapy profession.

This chapter will explain and define physiotherapy and work-related spinal disorders (WSD). The rationale for the study and the study's research question, aim and objectives will be presented. Finally, for orientation, each chapter of this thesis will be briefly introduced.

1.1 Physiotherapy

The profession of physiotherapy in the UK evolved from a “hands-on” massage background at its inception in 1894, through various guises to the all graduate autonomous healthcare profession it is today. A formal and complete, though condensed, definition of physiotherapy can be taken from the Chartered Society of Physiotherapy (CSP) Curriculum Framework: “Physiotherapy is a health care profession concerned with human function and movement and maximising potential. It uses physical approaches to promote, maintain and restore physical, psychological and social well-being, taking account of variations in health status. Physiotherapists in the UK are autonomous professionals. Physiotherapists work with people to optimise their functional ability and potential. They treat a wide range of physical conditions across the life span. Physiotherapists use manual therapy, therapeutic exercise and the application of electro-physical modalities.” (CSP, 2002 p 19). Physiotherapists combine their knowledge and skills to identify an individual patient's functional needs and improve a broad range of physical problems associated with different systems of the body. They are involved in a wide range of clinical areas and treat neuromuscular (brain and nervous system), musculoskeletal (soft tissues, joints and bones), and cardiovascular and respiratory systems (heart and lungs and associated physiology) (CSP, 2014).

This description highlights the central role of the physical nature of the work across a broad spectrum of healthcare and incorporates the cognitive and behavioural elements which define a profession. The psychosocial aspect of the patient/client, and their return to normal psychological and social well-being, is addressed in the definition and as such it demonstrates the holistic nature of the physiotherapy approach.

In summary, physiotherapy is an autonomous healthcare profession which combines knowledge, skills and attitudes to assist people to optimize their movement, to achieve the fullest possible physical and psychosocial function through the use of a range of physical and electrical modalities.

Physiotherapy takes place in a wide variety of clinical settings including hospital in-patient and out-patient provision, community based care and primary healthcare settings. The life spectrum is covered from birth to death and involves paediatric care through adolescence to adulthood and elderly care.

1.2 Work-related musculoskeletal disorders (WMSD) and work-related spinal disorder (WSD)

Often within the literature work-related spinal disorders (WSD) are not differentiated from work-related musculoskeletal disorders (WMSD) and data are combined, though in other literature WMSD and WSD are easily differentiated or individually studied. To enable comprehension of the literature it is necessary to identify the current understanding of each of these recognised terms. The European Agency for Safety and Health (OSHA) describe WMSD as “impairments of the bodily structures, such as muscles, joints, tendons, ligaments and nerves, which are caused or aggravated primarily by the performance of work and by the effects of the immediate environment in which work is carried out” (OSHA, 2007). Lutmann et al. (2003 p 7) further refined the definition to include a range of severities “from light and transitory disorders to irreversible disabling injuries”.

These definitions of WMSD identify that it is not only the physical nature of the work which could be involved in the development of WMSD but also other conditions which apply in the workplace environment. These descriptions suggest that aspects, including activities and conditions, are

given weighting and the WMSD may be aggravated as well as caused by the factor. Although WMSDs can affect muscles, joints and tendons in all parts of the body The National Institute of Occupational Safety and Health's (NIOSH) definition of WMSD is "conditions that affect the nerves, tendons, muscles and supporting structures, such as the discs in your back. They result from one or more of these tissues having to work harder than they're designed to" (IOSH, 2014). It may be unintentional but this definition tends to make the reader concentrate on the back rather than the whole body. IOSH (2014) like HSE (2014) do go on to suggest that WMSDs can be sub-divided into back disorders, upper limb disorders and lower limb disorders.

The current recognition of what constitutes WMSD is at times wide-ranging and ill-defined. In contrast the definition by the HSE for WSD is more specific and extremely brief and is simply recognised as "Musculoskeletal disorders affecting the back". As the definition for WSMD can be a little ambiguous, and it has been used as the basis for the definition of WSD (HSE, 2014) this definition for WSD is consequently also ambiguous. Therefore a clear and comprehensive definition of WSD for this study was required which incorporated a combination of aspects of the definitions from HSE (2014) for both WMSD and WSD and aspects of condition severity which had been included in definitions for WMSD (Lutmann et al., 2003).

The definition for WSD created for this study by the author, to incorporate elements of the previous definitions and encompass all aspects of the condition was: Injury, damage or dysfunction involving the spinal column (cervical, thoracic, lumbar and pelvis), caused by, or aggravated by work. It may or may not involve a specific incident, be insidious, or intermittent, constant or episodic, frequent or infrequent, mild or severe.

1.2.1 Prevalence of WSD

In the UK the Health and Safety Executive (HSE) monitors, through the Labour Force Survey, the prevalence rate of WMSD showing the total number of WMSD cases in 2011/2012 was 439,000 out of a total 1,073 000 for all work-related illnesses. The main work activities attributed by respondents as causing or making their WMSD worse, was manual handling, awkward or tiring positions and keyboard work (HSE, 2014), all of

which are activities routinely carried out by physiotherapists. Further, within the Labour Force Survey WSD was identified as a common work-related complaint reported. Results show that there has been a reduction in the estimated prevalence of work-related back disorders in the last decade from 295,000 in 2002/2003 to 176,000 in 2012/13. Whilst this reduction is to be applauded and is considered to be as a result of efforts by the health and safety community over the last ten years in the UK, there continues to be high prevalence. The industries with the highest estimated prevalence rate of WSD are firstly the construction industry and secondly human health activities, in particular hospital activities. These two industries have statistically significant higher rates of back disorders than the average across all industries. This is clearly a concern for health workers which is further compounded when it is considered that the occupations within the two industries with the highest estimated prevalence rates of back disorders are firstly health professionals, therefore exceeding the construction and building trades in second place and in third place caring and other service occupations, in particular caring personal services. Whilst caring personal services is not a primary role of a physiotherapist it is an activity type with which they will be involved and, considered in conjunction with the highest statistics for health professionals, it can be seen that physiotherapy could be considered to be at risk of WSD as a profession.

In the literature, which will be discussed in Chapter 2, (Molumphy et al., 1985, Bork et al., 1996, Holder et al., 1999, West and Gardner, 2001) it was identified that different clinical areas in which physiotherapists work pose a higher risk of WSD than others. There is a lack of specific detail but there appears to be a consensus regarding rehabilitation as posing an increased risk. Greater detail regarding hospital work is provided by Glover et al. (2005) who identified that physiotherapists involved in neurological rehabilitation and orthopaedics were at high risk of WSDs. Barnes et al. (2007) whilst agreeing with Glover (2005) additionally identified that cardiothoracic work was also risky for WSDs. Although the prevalence rate of WSD varies across clinical speciality, acute hospital care and

rehabilitation were recognised as being high risk areas for WSD within the physiotherapy profession.

1.3 Rationale for the study

As has been identified in 1.2.1 physiotherapy can be seen as a profession at risk from WSD. This has been recognised within the profession and, following concerns raised by the membership of the Chartered Society of Physiotherapy (CSP), through a motion presented at the Annual Representative Conference of the CSP, Glover et al. (2005), supported by the CSP, identified that Band 5 (entry level) physiotherapists were the most likely to be injured, and there was a high career prevalence rate of injury. However, they were not able to study, in depth, the reasons for this and it appears that there has been no follow-up or consequences of that study. In 2008 a study was conducted by this researcher (though not published) going back a stage from Glover et al. (2005), to investigate Band 5 physiotherapists' understanding and perceptions of treatment handling. It used a sequential method via a reflective journal and two focus groups and the results were disturbing, *"It's hardly surprising you end up with bad backs", "...you think you're indestructible I think when you are young", "I won't be a physio all my career ...I don't want to be injured", "I have decided not to work on the stoke unit again", "...it's patient safety first and I always feel we are a bit second..."* (Coales, 2010)

From the results of this study (Coales, 2010), the initial concerns raised by members of the CSP, the high prevalence rate of general WMSD, and specifically WSD, in physiotherapists (Glover et al., 2005) which does not appear to have changed much in the last 30 years (Molumphy et al., 1985) despite the introduction of legislation to reduce the risks there is clearly an issue within the profession. Previous studies have primarily been of a quantitative nature examining prevalence rates, causes and response to injury in a variety of geographical and clinical areas. For the wellbeing of individuals and the profession as a whole a study using a qualitative approach concentrating on physiotherapists within the National Health Service (NHS) in the UK was warranted hence this study was completed.

1.4 Research Questions, Study Aims and Objectives

Predominantly the evidence within physiotherapy is quantitative in nature with limited qualitative studies conducted. The understanding and feelings of physiotherapists who are those exposed to the risks of WSD have not been explored and exposes a gap in the evidence. Therefore, a qualitative study to address this gap was justified to increase the evidence base for safe physiotherapy practice. This study was a qualitative exploration of perceptions of WSD of those within the physiotherapy profession who were involved in clinical practice or in physiotherapy management or strategic decision making.

1.4.1 Research questions

Main research question

What are the perceptions of physiotherapists of the contributory and risk reduction factors for work-related spinal disorders in the physiotherapy profession?

Secondary research questions

What are the perceptions of physiotherapists who have experienced work-related spinal disorders, of the causes of work-related spinal disorders in the physiotherapy profession?

What are the views of physiotherapists who have experienced work-related spinal disorders about the reduction of the risk of work-related spinal disorders?

Consequently from the research questions the aim for the study, and its objectives, were developed.

1.4.2 The study aim

To develop a theory regarding the contributory and risk reduction factors for work-related spinal disorders in the physiotherapy profession

1.4.3 The study objectives

To explore with physiotherapists who have experienced work-related spinal disorders the factors they perceive contribute to work-related spinal disorders.

To explore with physiotherapists who have experienced work-related spinal disorders the factors they perceive reduce the risk of work-related spinal disorders.

1.5 Thesis format

To guide the reader a brief introduction to each chapter of the thesis is presented.

Chapter 2 – Literature review. In this chapter the prevalence rates of WMSD and WSD in a broad environment and then specifically in physiotherapy are presented and considers the response to injury by physiotherapists. It explores the causes of WSD both biomechanical and non-biomechanical, in general and specifically to physiotherapy and then in relation to other therapy professions. The impact of WSD is presented and finally it considers the professional, legislative and research measures in place to reduce the risk of WSD.

Chapter 3 – Methodology. In this chapter the background philosophy and aspects of ontology and epistemology which were considered in the creation of the study are presented. Grounded theory as a qualitative approach for this study is explored in relation to its development and different schools and a rationale for the choice of constructivist grounded theory is presented. Aspects related to the development of a theory are explored. The positionality of the researcher and its impact on the study is also explored.

Chapter 4 – Methods. In this chapter the ethical and governance issues of the study are considered. The context of a University Health Board in Wales as the site for the study, and consultation undertaken, is explained. The selection of participants and the inclusion and exclusion criteria are presented. The use of semi-structured interviews and the development of the interview schedules are explained. The recruitment and initial data analysis is presented through the data collection stage and the phases identified from pilot interviews through initial recruitment to theoretical recruitment. The focused data analysis is explained and the final themes presented.

Chapter 5 – Findings and analysis. In this chapter the demographic profiles of the participants and the final themes and factors are presented. Each of

the three final themes, and their factors and sub-factors, is then presented individually and supporting evidence from the interview transcripts is used to support the analysis. Finally the theoretical model is presented and explained.

Chapter 6 – Discussion. In this chapter the findings of this study in relation to the literature are presented. Each theme is presented and discussed with regard to previous literature. As the findings of the study were not pre-empted, appropriate new literature and evidence has been incorporated into the discussion chapter in response to the emergent themes where necessary.

Chapter 7 – Conclusion. In this chapter the key findings of the study are presented, the limitations of the study are discussed, areas for further study are suggested and recommendations are made. Finally it identifies the new contribution to knowledge from the study's findings.

The references and supporting appendices are presented at the end of the thesis.

2 Literature review

In this chapter the literature is reviewed and the prevalence of WMSD and WSD in general occupations and in physiotherapy specifically are discussed. It considers the general causes of spinal pain and WMSD and WSD in physiotherapy and discusses how physiotherapists respond to injury. It considers the legal and professional framework within which physiotherapy practice takes place and considers further evidence regarding risk reduction in physiotherapy practice. The evidence used has come from government and professional sources and guidelines as well as academic research studies.

A systematic search strategy was undertaken repeatedly between September 2014 and February 2017 to identify relevant literature. The databases included were: CINAHL, Ovid medline, Scopus and Web of Science. Within the literature search the following filters were included: English language, human studies, worldwide, the initial date range was from January 1985 – December 2015 which was extended to January 2017 as the study progressed to include up-to-date literature. The first search was broad to include a spectrum of health care professionals and included key words: pain, back pain, occupational disease, occupational musculoskeletal, work-related, occupational, physiotherapy, physical therapy, allied health professions, professions allied to medicine, occupational therapist (Appendix 1 figure 11). Another search concentrated on nursing literature and included similar key words though incorporating nurse, nurse band, nurse speciality (Appendix 1 figures 12 and 13). Due to the volume of literature and the emphasis of the study this search had additional filters for location which was restricted to UK and Ireland, and date which was limited to January 2005 to December 2015. A further search concentrated on physiotherapy and included the previous key words and included physiother* to capture the literature (Appendix 1 figure 14). All searches included the use of the combinations of AND and OR to combine terms to ensure comprehensive retrieval.

2.1 General Prevalence/Incidence of WMSD

Research regarding prevalence of work-related musculoskeletal disorders (WMSD) and work-related spinal disorders (WSD) in physiotherapy has been carried out in a variety of geographical areas and it is therefore worth considering data from these regions in relation to the general workforce and in relation to healthcare workers and physiotherapy. Information regarding prevalence and incidence rates can often be confusing or may only divulge partial data from which assessments and conclusions must be created as data for WMSD often includes the data for WSD. This section considers the information from a worldwide view through to a European perspective to the UK and then specifically to Wales.

In the USA, where some of the research on physiotherapy WMSD has been conducted (Molumphy et al., 1985, Bork et al., 1996) the Centers for Disease Control and Prevention (CDC) collated data from 2003 to 2007 and identified that the highest prevalence rate for WMSD was observed for transportation and warehousing and secondly for healthcare and social assistance. New cases (incidence) of WMSD requiring days away from work were recorded and in healthcare and social assistance this ranged from a low of 66,060 in 2007 to a high of 83,100 in 2003 showing a gradual decrease of 5.5% over the period. A similar decline in total WMSD cases involving days away from work was observed as the rates varied from 76.9 to 55.4 per 10,000 full-time workers over the period 2003-2007 (CDC, 2008). Although it is not possible from the data to isolate information regarding physiotherapy specifically and, despite the observed gradual reduction in incidence and prevalence rate of WMSD, it is of concern that healthcare, a part of which is physiotherapy, remains the second highest in the twenty industries recorded. The results for healthcare workers were higher than for other industries which might have been considered more likely to have high rates including mining, forestry and agriculture.

Other research into WMSD in physiotherapy has occurred in Australia (Cromie et al., 2000, West and Gardner, 2001, Cromie et al., 2002, Nyland and Grimmer, 2003) where the appropriate government agency in Australia, Safe Work Australia, (SWA, 2013) identified through use of recorded

incidence of workers' compensation claims that, despite a 28% reduction between 2002/2003 and 2010/2011, the WMSD rate for workers in healthcare was seventh out of seventeen industries studied with a rate of 14 per 1000 employees. The results, once again, showed higher rates of WMSD than industries which may be considered to be more risky, including mining and, although the measure recorded was different, this result reflects the statistics for the USA (CDC, 2008). The type of WMSD identified was mostly sprains and strains (41.9%) with soft tissue and spinal disorders accounting for approximately 10% each (SWA, 2013). Of concern is that the contributory factor most frequently identified was "body stressing" which is defined as "due to repetitive movements, muscle loading, muscular stress with no objects being handled, muscular stress while handling objects other than lifting, carrying or putting down and muscular stress while lifting, carrying or putting down objects" (Australian Safety and Compensation Council, 2006, p vii). This type of activity is common in physiotherapy practice so, although it is not possible to identify statistics for physiotherapy there is evidence to suggest, similar to the USA, physiotherapists could be at more risk than other workers.

Research into causes of WMSD and methods for reduction of risk has also been carried out in India and a small number of African countries, including Nigeria and South Africa, though it has not been possible to access any purposeful data to make any comparisons for prevalence and incidence from these countries.

Other research in physiotherapy has taken place in the UK (Scholey and Hair, 1989, Holder et al., 1999, Glover et al., 2005, Graham and Gray, 2005) and new member states of the European Union (EU) including Turkey and Slovenia, (Salik and Ozcan, 2004, Rugelj, 2003). As this study took place in UK and it was not possible to access any purposeful national data for Slovenia and Turkey it is appropriate to consider in more detail the statistics pertaining to the UK. The Health and Safety Executive (HSE) are the body within the UK, similar to the agencies in USA and Australia, which is concerned with issues that affect workers' health through developing and reviewing regulations, producing research and statistics and enforcing law

(HSE, 2014). They monitor annually both the prevalence and incidence rates of occupational disease and during 2004/2005, in addition to the annual monitoring, carried out a survey of twelve industries recording self-reported full days lost due to work-related illness or injury. The health and social care sector showed the highest rate with 4,100,000 cases reported with handling, carrying and lifting being the most common cause of injury, including animate and inanimate handling. The greatest number of days lost was due to WMSDs (1,500,000) with the majority (437,000) involving the low back and 680,000 being the result of handling loads. This disappointingly high result was despite the introduction of Manual Handling Operations Regulations (MHOR) more than a decade previously in 1992 (MHOR, 1992). The data refer to the health and social care sector and, although specific profession's data were indistinguishable, nor was it possible to differentiate between WMSDs and WSDs, what is clear is that these figures give cause for concern as physiotherapy can be included in the health and social care sector.

Recent statistics produced by the HSE (HSE, 2013) identify a reduction in WMSDs from the 2004/2005 survey data and, although direct comparison to the USA and Australia is difficult as different data were collected, it reflects the similar reduction identified in the USA and Australia. The different outcomes measured makes it difficult to compare even within the UK as the survey of 2004/2005 recorded total days lost whereas the more recent data present annual rates for self-reported WMSDs (Table 1).

Year	New cases (Incidence)	Total cases (Prevalence)
2007 – 2008	178,000	539,000
2008 – 2009	191,000	536,000
2009 – 2010	190,000	572,000
2010 – 2011	158,000	505,000
2011 – 2012	141,000	439,000

TABLE 1: SELF-REPORTED WMSDs IN UK (TAKEN FROM HSE, 2013)

Although differentiation between WMSDs and WSDs is not possible, and similar to both USA and Australia there is an apparent downward trend in

both incidence and prevalence rates, the rates of WMSDs and WSDs within the UK remain high. Overall there were 7.5 million days lost to work in the UK from WMSDs in 2011/2012 (HSE, 2013a) second only to stress, depression and anxiety (10.4 million days). These data were able to identify WSD specifically and the industries with the highest estimated prevalence rate of WSD (averaged over 2009/10 – 2011/12) were firstly the construction industry and secondly human health activities, in particular hospital activities. The construction and human health industries both had statistically significant higher rates of WSDs than the average across all other industries and reflect a similar pattern to USA and Australia where WMSD rate, though not specifically WSD rate, were high in the league table of studied industries. Within the UK industries' HSE data the healthcare occupations were represented high in the league table with the highest estimated prevalence rates of WSD being firstly health professionals and, in third place, caring and other service occupations, in particular caring personal services (HSE, 2014) reflecting other data in concerns for the welfare of healthcare occupations.

The statistics from Great Britain (GB) may appear high when compared to results from the European Union (EU) but they are in fact, relatively, better. Although comparisons are difficult due to the variety of data collection methods used, GB was overall third lowest in all areas of self-reported health issues when the standardised Eurostat form was used (HSE, 2013a). The GB statistics compared favourably when set against EU-15 countries (including long established European countries) and EU-27 countries (including recently integrated European countries), which might be expected in view of the development of some of the more recent member countries of the EU which include Turkey (Salik and Ozcan, 2004) and Slovenia (Rugelj, 2003). GB, when factored against peer EU countries including Germany, Italy, Spain and Portugal returned similar results. These figures refer to GB, a term which, although technically includes England, Scotland and Wales and excludes Northern Ireland, is often used interchangeably with UK which includes Northern Ireland. It is unclear in which way the term GB is used in the report (HSE, 2014a) though clearly the statistics included those for Wales which is pertinent to this study which was conducted in Wales.

Wales is a devolved country of UK and has responsibility for its own Health Service and, as this study took place in Wales it is appropriate to consider its data. Again it is difficult to compare as different data were collected in Wales, as The Welsh Assembly Government (WAG), (known as the Welsh Government (WG) since May 2011) published the percentage absence rates, per 100,000 people in the NHS quarterly by staff group and health organization for the first time in 2010 (WAG, 2010), rather than incidence and prevalence rates as used by CDC, SWA and HSE. The Welsh Support Workers, the categories which may include physiotherapists and physiotherapy assistants, were 3.9% and 7.1% respectively which compare positively and negatively to the annual NHS rate of 5.1%. The report identified that lower rates can be related to under-reporting (WAG, 2010) as also identified in studies on physiotherapists' response to injury (Molumphy et al., 1985, Bork et al., 1996 and Holder et al., 1999). WAG has historically set a target of 4.2% for the whole of the NHS but in 2009/10 replaced this with individual health organization rates which for the Health Board chosen for this study was 4.95% which was reduced again in 2010/11 (WAG, 2010a), though the rationale for these rates was not apparent. This generic target for a whole organization has limitations as an indicator when considering specific staff groups though the WG's aim to reduce the rate is linked to providing a more efficient cost-effective service and improved staff well-being (WAG, 2010a).

Despite differences in measures and data collected the statistics presented above demonstrate similarities across first world countries showing a general downward trend in WMSD though the healthcare sector retains a high prevalence and incidence rate when compared to other work and industrial sectors. WSD remains the most commonly reported WMSD in most work sectors and specifically in areas related to healthcare provision. It can therefore be seen that WMSD and WSD continue to present a problem in maintaining a healthy healthcare workforce.

The ongoing staff absence rates, as annually recorded by WG, can be used as a measure of staff ill-health, which can be used to instigate change. In addition to the data already presented The Chartered Institute of Personnel

and Development identify that the staff absence rate is significantly higher in the NHS than other public sector organizations and the private sector (CIPD, 2010). Recognizing this discrepancy, a report on staff well-being in the NHS in the UK was commissioned and made recommendations in the areas of organizational behaviours, service implementation and embedding the idea of staff well-being in the NHS infrastructure (Boorman, 2009). This suggests that staff health and well-being within the NHS has not, until prior to Boorman (2009), been a priority and the report acknowledges that implementing change presents a number of challenges.

2.2 Prevalence of WMSD and WSD and response in physiotherapy

The statistics presented in 2.1 identify that healthcare workers, potentially including physiotherapists, are at risk of WMSD and WSD at a rate which can be higher than other occupational sectors and this section explores the evidence regarding physiotherapy specifically.

The earliest evidence of study of prevalence rates (Molumphy et al., 1985) identified a gap in the evidence as WMSD are better documented in the nursing profession, and suggested that this can be as a result of the assumption that physiotherapists are knowledgeable in the prevention and treatment of low back pain (LBP). This leads to a further assumption that, as a result of the knowledge, physiotherapists are unlikely to suffer from LBP and hence the subsequent lack of investigation. To rectify this a questionnaire was sent to a randomly selected sample of 500 physical therapists registered in California to investigate the incidence rate specifically of work-related LBP. There was a good return rate (69%). The sample reflected a Californian physical therapist working population not a UK physiotherapy population where working practices may be different. The sample had a variety of work environments with the most common being private practice (22%) which would be dissimilar to a UK sample, and a range of ages and grades with the highest incidence being 26 – 35 year age range (48%) and staff grade (equivalent to entry level physiotherapist Band 5 NHS) (57%). Despite the possibility of re-call bias the result showed that 29% reported work related LBP and a further 23% non- work related LBP.

The LBP was addressed in a variety of ways with 49% seeking medical consultation and 41% requiring sick leave at the onset. Subsequently 18% needed to change work settings and 12% reduced the number of hours of patient contact.

Molumphy et al. (1985) suggested that the young inexperienced therapists are inexperienced in proper patient handling and of judging patient capabilities and that they may feel uncomfortable requesting assistance with patient handling. They postulated there may be a higher percentage of less experienced therapists working in the acute care and rehabilitation settings which could account for the higher prevalence in these areas. They suggested that the use of reduced patient contact hours and change of work setting to manage recurrent LBP may be because therapists wished to remain in a patient contact setting.

This study took place in USA where work practice and legislation is different to UK, and was undertaken in 1985 before the implementation of Manual Handling Operations Regulations (MHOR) (1992) in the UK. Despite this it provides the first objective data about the incidence of LBP in physical therapists and shows an alarmingly high result in younger and less experienced therapists.

The only other study conducted in the 1980s was in the UK (Scholey and Hair, 1989) and investigated back pain (BP) in physiotherapists compared to a control (non-physiotherapist) group, matched for age and sex, to determine whether professional knowledge was associated with LBP as suspected by Molumphy et al. (1985). A purposive sample of physiotherapists and a control sample from the general population were sent a self-reported questionnaire. Results showed no difference between the groups in the lifetime, annual and point prevalence of LBP and the distribution and number of incidences were similar. However, significantly more physiotherapists than controls identified occupational risk factors and/or attributed their LBP and its' initial episode to work. In response physiotherapists took remedial action after fewer episodes than the controls but were less likely to consult a doctor. Once again it was the under 30 aged physiotherapists who had the

highest incidence (46%) concurring with the findings of Molumphy et al. (1985). Scholey and Hair (1989) discussed factors which are no longer applicable following the introduction of MHOR (1992) but they did suggest that the advantage of professional knowledge of LBP was counterbalanced by the stresses encountered in practice.

In the 1990s two further studies were conducted in the USA where Bork et al. (1996) carried out a study to investigate prevalence of all WMSDs in physiotherapists whilst Holder et al. (1999) aimed to take the knowledge further by surveying not only physiotherapists, as per Molumphy et al. (1985), Scholey and Hair (1989) and Bork et al. (1996), but physiotherapy assistants. Bork et al. (1996) similar to Molumphy et al. (1985) conducted the study to address gaps in the evidence and in their background they were only able to refer to Molumphy et al.'s (1985) and Scholey and Hair's (1989) work suggesting little or no research had been conducted in the previous seven years. Three years later Holder et al. (1999) were still only able to refer to these previous three studies. Both studies, Bork et al. (1996) and Holder et al. (1999), used self-reported questionnaires which were sent to the alumni of the University of Iowa Physical Therapy Programme (Bork et al., 1996) and 500 each of physical therapists and assistants (Holder et al., 1999) across all States. Holder et al.'s (1999) sample did not reflect the percentage make-up of therapists and assistants in the American Physical Therapy Association but was considered appropriate based on the hypothesis that injury rates were not related to occupational position. This statement was not supported and may mean the sample was not truly representative which questions the trustworthiness of the results. The questionnaires used in the studies were different with Bork et al. (1996) basing it on standardized questionnaires developed to investigate work-related musculoskeletal disorders and Holder et al. (1999) creating their own questionnaire following a literature review, interviews with practicing therapists and assistants and piloting which also included a reliability study. The resulting questionnaires, though very similar to Molumphy et al.'s (1985), were more robust, due to the nature of their development. In addition to the questionnaire Bork et al. (1996) used a list of seventeen job factors

that were considered problematic to the development of WMSD though it is unclear from where these factors were developed making its inclusion, and the data it generated, less reliable. Both studies generated a very high return rate, unusual in this method, with Bork et al. (1996) achieving 80% and Holder et al. (1999) 67%. Their results were very similar with Bork et al. (1996) finding a 12-month prevalence rate for work-related LBP in lumbar 45%, the upper back 28% and neck 24% whilst Holder et al. (1999) showed lumbar 62% and upper back 23%. Bork et al. (1996) found prevalence to be related to age with the highest incidence between 42% and 52% between 25 and 50 years and the lowest incidence in the over 50s, which was supported by Holder et al. (1999) who found the highest prevalence in physical therapists aged 21 to 30 years therefore also supporting the evidence from Molumphy et al. (1985). Holder et al. (1999) found that years of experience was not significant which is the first statistic which differs from the previous studies. Bork et al. (1996) additionally found that female therapists had a significantly higher WMSD rate than males. They speculated that a reason for the lower prevalence of WMSD in older therapists can be as a result of a survivor bias ie. that is those who have developed strategies for coping with the physical demands, and those who do not adopt injury-prevention strategies may retire early and indicated that the difference in incidence between male and female therapists could be related to physical strength. Holder et al.(1999) supported the findings of Bork et al.'s (1996) recognition that staff changed their working environment to help manage their WMSD as they found the clinical practice setting seemed to influence not only the prevalence but also the type of injury, with 75% of physical therapists in rehabilitation reporting LBP compared to 64% of those in out-patients. Holder et al. (1999) put a particular emphasis on respondents' response to injury. In total 36% of therapists and 49% of assistants reported their injury and saw a physician 34% and 44% respectively. In response to recurrent episodes 79% of therapists and 81% of assistants reported altering their work practice whilst therapists also reported using other personnel and altering body posture frequently. Through making these adjustments 92% of therapists and 93% of assistants had not limited their patient contact time. These responses are similar to those cited in Molumphy et al. (1985) and in

Scholey and Hair (1989) and Bork et al. (1996) who found 25% changed their working environment and/or their working practices though very few respondents missed work or sought medical consultation. The majority (61%) treated themselves or asked a colleague, and therapists continued to work when injured. Holder et al. (1999) suggested the therapists' lower rate of seeking advice from a physician is because they are more likely to self-diagnose and seek help from a colleague which supports Bork et al.'s (1996) view. Unlike Bork et al. (1996) who found that it was mostly LBP that caused therapists to seek medical advice, Holder et al. (1999) identified it was more likely to be a neck injury.

Although not exactly the same in its aims the results of Bork et al.'s (1996) work, which can be accepted with some reservation, are strikingly similar to those of Molumphy et al. (1985) and Scholey and Hair (1989) and suggest that little had changed in the intervening eleven years. The findings from Holder et al. (1999) despite the reservations regarding the sample, add to the previous knowledge in terms of the assistants' information. However, because of the possible sampling issues, these results need to be considered in the light of other evidence available. Although these studies were conducted in USA they have parallels to the UK and the concerns to the profession that the studies from the 1980s and 1990s present need to be considered in UK. Despite the reservations regarding Holder et al. (1999) the results of, and reasons given, in these studies are so similar, despite differing data collection tools and samples, that the conclusions drawn can be considered collectively and point to the presentation of a consensus. It is of concern that there appears to be no change in prevalence over an eleven year period although the only UK based study (Scholey and Hair, 1989) was conducted after the implementation of Health and Safety at Work Act (HASAWA) (1974) but before the introduction of Manual Handling Operation Regulations (MHOR) in 1992.

From 2000 to 2010 further studies took place worldwide. In Australia Cromie et al. (2000), investigated physical therapists in Victoria and West and Gardner (2001) carried out a similar study in Queensland. It is unclear why West and Gardner (2001) carried out the study as, although they identified a

gap in evidence for physiotherapy students, students were not included in the sample though, unlike previous studies (Molumphy et al, 1985, Scholey and Hair, 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000), they did recruit from physiotherapists who had left the profession in the previous three years therefore gathering information from a previously un-researched group. As in previous studies Cromie et al. (2000) and West and Gardner (2001) studies' used purposely developed self-administered questionnaires and although it is not clear upon what they were based the work section in each case again appear to include the seventeen problematic job factors as per Bork et al. (1996), limiting the exploration of that topic. Once again high return rates were achieved and findings showed a 12-month prevalence rate of 83% for all WMSDs with the most frequent being LBP 35% and 27% neck pain (Cromie et al., 2000) though West and Gardner (2001) found a lower 12-month prevalence of 40% but the definition for WMSD was different in the two studies and, again, recognised the spine as the most common site with 35% lumbar and the neck 24%. Cromie et al. (2001) found age was once again related to prevalence, being inversely related which concurs with other studies, though unlike other studies (Molumphy et al, 1985, Scholey and Hair, 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, Rugelj, 2003, Salik and Ozcan, 2004, Glover et al., 2005, Barnes et al., 2007) West and Gardner (2001) found no relation with WMSDs for age though they did identify that 16% of those with WMSD first experienced it as a student. Cromie et al. (2000) did not note any difference in prevalence between males and females unlike Scholey and Hair (1989) and Bork et al. (1996). The response to these injuries showed similar trends to previous studies (Molumphy et al, 1985, Scholey and Hair, 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000); modification of practice, change of duties and seeking of physiotherapy treatment. New data was identified by Cromie et al. (2000) as a small percentage (3%) did have to leave the profession due to WMSDs.

An important study with respect to the UK was conducted by Glover et al. (2005) who were prompted to study the phenomenon in UK following Cromie et al.'s (2000) and West and Gardner's (2001) results and following concerns

raised by members of the CSP at the Annual Representative's Conference. 10% of the CSP membership, which includes both physiotherapists and physiotherapy assistants similar to Holder et al. (1999) were sent a self-administered questionnaire which was based on the validated Nordic Questionnaire and on the questionnaires used by Cromie et al. (2000) and West and Gardner (2001) which were based upon Bork et al.'s (1996) seventeen problematic job factors work. Unsurprisingly, due to the tools used, the results were similar to those previously reported and identified a career prevalence of WMSD 68%, a 1 year prevalence of 58% and that low back (48%), neck (33%) upper back (23%) had the highest rates of injury. Similar to previous studies 32% first experienced their worst injury within 5 years of graduation, though a greater number (58%) were under 30 years old when their most significant injury occurred. The response to injury was similar and involved seeking treatment from a colleague, modification of practice and taking sick leave (CSP, 2005a, Glover et al., 2005). Although this study was compromised by the use of the same restricted and unsubstantiated list of problematic job factors as developed by Bork et al. (1996) the prevalence rates were calculated using validated questionnaires and show little change from Scholey and Hair's (1989) values, pre 1992 introduction of Manual Handling Operations Regulations (MHOR) 1992 in the UK. This lack of change after legislation is cause for considerable concern for the physiotherapy profession.

Salik and Ozcan, (2004) based their work on previous studies (Holder et al., 1999, Cromie et al., 2000) using a population of physiotherapists in Turkey with similar results in terms of prevalence, site of injury and response and add little other than geographical area. Barnes et al.'s (2007) study was of a similar type and was conducted in South Africa as a result of the recognition of no evidence about work-related LBP in physiotherapists in that country. Analysis of the results of this study, which identified a 67.5% prevalence rate of WLBP, suggested that Bork et al.'s (1996) seventeen factors provided a large influence, though it cannot be confirmed. The response to WLBP were similar to other studies though new evidence from this study suggests that 5.4% of respondents plan to retire early due to pain or injury. Adegoke et al.

(2008) studied WMSD in physiotherapists in Nigeria using two questionnaires based on those used in previous studies and included the seventeen risk factors associated with Bork et al. (1996) thus limiting the potential detail. They identified that the low back and the neck were the anatomical areas most frequently associated with pain, (69.8% and 34.1%) respectively with 50% of all respondents experiencing their initial problem within five years of graduation which reflects results from other studies. The response was similar to other studies in relation to modifying work practices but, due to limited career options in Nigeria, they were unable to alter their work options.

These studies, using self-administered questionnaires which were either created for the study or based on those from previous work (Molumphy et al, 1985, Scholey and Hair, 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, West and Gardner, 2001, Salik and Ozcan, 2004, Barnes et al., 2007, Adegoke et al., 2008), do support the premise that the practice of physiotherapy, even within different geographical, political and social environments, has a fairly high and consistent prevalence of WMSDs which are caused by similar activities and dealt with by physiotherapists in the same way regardless of location. Further studies have aimed to increase knowledge and breadth by including different designs and populations (Rugelj, 2003, Nyland and Grimmer, 2003, Bialocerkowski et al., 2005, Campo et al., 2008 and Grooten et al., 2011).

The study by Rugelj (2003) differed in approach to other studies (Molumphy et al, 1985, Scholey and Hair, 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, West and Gardner, 2001, Salik and Ozcan, 2004, Glover et al., 2005, Barnes et al., 2007, Adegoke et al., 2008) by including an open question that was administered to conference delegates in Slovenia, instead of via post. A career prevalence of LBP of 73% was reported but unlike other studies (Molumphy et al, 1985, Scholey and Hair, 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, Rugelj, 2003, Salik and Ozcan, 2004, Glover et al., 2005, Barnes et al., 2007, Adegoke et al., 2008) this was seen to be more prevalent in the older age group, 31-50 years, where recurrent pain was identified thus recognizing a

new phenomenon. The physiotherapists managed their LBP in similar ways as previously identified. Unfortunately the comments from the open question, which may have given in depth data were not reported and as such was a wasted opportunity to engage in qualitative discussion.

Nyland and Grimmer (2003) did investigate the physiotherapy students as identified but not studied by West and Gardner (2001) by sampling all students enrolled in one Australian University and used a self-administered, specifically developed, questionnaire concentrating on LBP. It was based on the validated Nordic Back Pain Questionnaire which was included in the development of the questionnaires used by Bork et al., 1996, Cromie et al., 2000 and Glover et al., 2005, Adegoke et al 2008, and on focus group results for the educational exposure component. A reliability study was conducted prior to administration and so can be considered more robust than tools used by other studies. They reported similar prevalence of LBP of 69% (lifetime), 63% (12 month) 44% (1 month) and 28% (1 week) and identified the risk of LBP significantly increased after year 1 of study. This study investigated a population previously un-studied and uncovered an alarming prevalence rate suggesting that graduates can enter the workforce with experiences of LBP. Bialocerkowski et al. (2005) also presented the findings of the prevalence of neck problems in undergraduate physiotherapists using the same study sample as Nyland and Grimmer (2003) in Australia. The prevalence rate was high with a lifetime rate of 61%, previous month 55% and previous week 38% and although studying was considered a contributory factor it was not clear if the contributory factors were pre-determined by the questionnaires or self-selected. The use of pre-determined choices would restrict the data to those choices given, and limit the ability to explore contributory factors beyond the choices offered for selection. Despite this issue this study gave data on a population not previously studied.

Campo et al. (2008) studied a population of American physiotherapists to develop previous research by using a design including a one year follow up. The questionnaires used were developed for the study using previous literature and in discussion with eight physiotherapists to ensure their

relevance. Although this resulted in pre-designated choices for contributory factors it was based on sound evidence. The initial questionnaire had a 67% return rate and was sent again a year later with a 93% return rate which is extraordinarily high for this design which could suggest a study population with a vested interest in the topic due to its relevance to them which may not therefore reflect the general physiotherapy population. The overall one year incidence rate for WMSD was high at 28% with low back and neck being the most frequent body areas and factors such as younger therapists and older therapists being more susceptible. Contributory factors were specifically identified for the low back including transferring patients, bent, twisted or awkward postures and repetition of tasks which reflect previous studies. Despite the concern about the second response rate this study did identify that WMSD are not single point and can, and do, continue over a period of time. A study in which Campo was also involved (Grooten et al., 2011) also aimed at extending the scope by investigating older female physiotherapists in Sweden with over fifteen years' experience. This study used the questionnaires developed for the Campo et al. (2008) study and received a 65% response rate. The results showed a prevalence rate of WMSD in the previous year to be highest in the low back (56.5%) although the neck (39.6%) and the upper back (20.8%) also demonstrated high rates. The contributory factors were similar to previously though on this occasion psychosocial factors associated with high psychosocial demands and low job control were also identified which extended from the physical factors previously reported. Although this study had a limited recruitment region it did highlight the difficulties associated with longer practice as a physiotherapist and is of concern when related to previous studies (Molumphy et al, 1985, Scholey and Hair, 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, Rugelj, 2003, Salik and Ozcan, 2004, Glover et al., 2005, Barnes et al., 2007, Adegoke et al., 2008) which identified younger physiotherapists as having a high prevalence and Rugelj (2003) who identified the highest prevalence in thirty to fifty year olds suggesting the career long exposure to the risk of WSD.

More recently Vieira et al. (2015) conducted an online survey of physiotherapists in Florida to gather information on the rates and severity of WMSD symptoms affecting nine different body parts. The survey was based on previous questionnaires used in studies of WMSDs in physiotherapists (Cromie et al., 2000, Salik and Ozcan, 2004, Campo et al., 2008 and Adegoke et al., 2008) which were themselves based on previous work. The questionnaire was converted for use via an online process and piloted twice to ensure a rigorous and relevant questionnaire. They received one hundred and twenty one completed questionnaires which provided similar details to previous studies confirming the body parts with the highest prevalence of symptoms were the low back (66%) and the neck (61%) which related to clinical speciality areas with physiotherapists working in acute care, elderly care and paediatrics most commonly affected with the low back, while for physiotherapists specialising in orthopaedics and neurology the body part most commonly affected was the neck. This supports that the prevalence and body parts affected varied by practice specialty area and continues to remain at a high seemingly unchanging rate. Subsequent to that survey Vieira et al. (2016) carried out a systematic review as they felt that the rates and characteristics of WMSD among PTs was not well known. They aimed to integrate the published evidence on the prevalence, types, and risks for WMSD among physiotherapists. Two reviewers independently searched and screened peer-reviewed articles published in English and agreement between the reviewers was evaluated. This well conducted review included thirty two studies and the findings identified that up to 90% of physiotherapists have WMSD during their careers, 50% experience WMSD within 5 years of practice and the low back was the body part most commonly affected. Female physiotherapists and physiotherapists working in hospitals have a higher prevalence rate. WMSDs are associated with physiotherapists' age, gender, clinical speciality and job tasks with lifting and transferring patients commonly associated with the development of WMSD. Although this review included all WMSDs and did not separate data for WSD the findings did identify the highest prevalence of low back or neck disorders. Vieira et al.'s (2016) systematic review exactly reflects the conclusions from this literature review and supports the concern of the continuing problem.

2.2.1 Summary of prevalence in physiotherapy studies

The studies presented in this section clearly identify that there is a high and consistent prevalence of WMSDs in physiotherapy practice regardless of geographical area which appears to have changed little since 1985. It was possible to extract the data for WSD from numerous studies and it was identified that the low back region was consistently one of the highest prevalence areas followed by the neck region. The mid-back was only infrequently isolated in the studies but when it was possible to identify the rate it was only slightly less than that for the neck. The data collected was often limited by the use of closed question self-administered questionnaires, used in all studies, and where lack of validity was evident in some studies, restricting the scope for deeper qualitative data. The response rate of questionnaire data collection methods is notoriously low though most of the studies returned a high response rate possibly suggesting a degree of participant self-selection and bias. There is always an issue of recall bias using this method which may be very important when asking respondents to recall injuries over their working life. However, the general consistency of the results is irrefutable and gives cause for concern, as does the general response to injury which primarily tends to be a hidden route by seeking treatment from a colleague and of lack of reporting of the injury. This approach, leading to an invisible problem, makes it harder for it to be addressed officially and harder to solve. Although there was a lot of consistency in some of the studies regarding the factors which contributed to WMSD and WSD, the causes of spinal pain generally and, specifically, the causes of WSD warrant consideration.

2.3 Causes of Spinal Injury/Disorder

2.3.1 General Causes of Spinal Disorder

A systematic review of the aetiology of back injury (Cole and Grimshaw, 2003) showed that it is multi-faceted and occurs when spinal loading exceeds tissue tolerance and involves both passive and/or active elements of the vertebral segment. Tissue failure involving the passive elements often results in compensatory movement strategies which can lead to further changes in spinal biomechanics (Kumar, 1996). The active elements must provide adequate stability to prevent tissue failure within the passive

elements (Bonato et al., 2003, Kollmitzer et al., 2002). Therefore, any muscular dysfunction due to injury (Bonato et al., 2003), fatigue (Gorelick et al., 2003) or poor motor control can be a potential cause of problems (Cholewicki et al., 1997). At spinal level L4/5 tissue fails between compression forces of 4000 Newtons (N) and 12,000N consequently NIOSH (Stuart-Buttle, 1996) recommends against working at a compression force level above 3400N. During patient handling manoeuvres forces have been found to exceed recommendations, with values of 4132-4433N recorded at L4/5 during transferring a patient out of bed (Skotte et al., 2002). The flexion mechanism during lifting involves changes in the normal lordotic curve of the lumbar spine redistributing the external load among the passive and the active systems (Shirazi-Aldi and Parianpour, 1999). The highest risk of spinal flexion, in a healthy sample of nurses occurred during tasks involving lifting whole or part of the body weight of the patient Schibye and Skotte (2000). During patient handling asymmetrical or combination movements are common place. Rotation is accepted as a moderate risk factor for injury during work related handling (Hoogendoorn et al., 2000) as spinal flexion and rotation combined result in migration of the nucleus pulposus posterolaterally (Fazey et al., 2006). Although much of the research on WMSD and WSD has involved nursing rather than physiotherapy studies the biomechanical effects apply equally to both professions.

2.3.2 Causes of WSD in physiotherapy

The World Health Organisation (WHO) acknowledges that a healthcare facility is a workplace as well as a place for receiving and giving care and that over 59 million workers are employed, around the world in providing healthcare. These workers are exposed to a complexity of health and safety hazards and although the WHO considers all aspects of risk including biological hazards and chemical hazards, physical and ergonomic hazards are also addressed (WHO, 2014). The WHO identifies that healthcare workers need protection from these workplace hazards just as much as workers in other industries but suggest that as their job is to care for others, they are often viewed, by themselves and other healthcare workers, as being immune to injury or illness. The WHO (WHO 2012) suggested that the

patients were seen to come first and that physiotherapists were often expected to sacrifice their own well-being for the sake of their patients. However, protecting the occupational health of healthcare workers is critical to having an adequate workforce of healthy health personnel. Lutmann et al., (2003) identify that in the industrialised countries worldwide one-third of all health related absences from all works are due to WMSDs of which the highest are low back related and secondly neck disorders. Consideration of the specific contributory factors for WSD in physiotherapy has been researched to a limited degree.

Retrospective analysis by the National Institute of Occupational Safety and Health (NIOSH) states that patient handling injuries originate largely from the magnitude of the load handled (Stuart-Buttle, 1996), working away from the body (Holbein and Redfern, 1997) in awkward positions, repetitious lifting (Marras and Granata, 1997), bending and twisting activities (Hoogendoorn et al., 2000, Stuart-Buttle, 1996) and psychological stress (Marras et al., 2000). These are augmented by environmental constraints and the unpredictability of the patient (De Looze et al., 1999). Mandatory manual handling training is required by healthcare workers in the NHS although evidence indicates that it has no effect upon reducing injuries or improving practices (Hignett, 2003, Best, 1997, Fanello et al., 1999, Yassi et al., 2001). In contrast, risk assessment/management strategies have been evidenced to significantly reduce both these factors (Hignett, 2001, Fazel, 1998). The studies presented in this section suggest a pattern of multifactorial biomechanical issues contributing to spinal disorder in general, and also identify tasks carried out during physiotherapy practice which can be considered to contribute to risk of WSD in the profession.

Molumphy et al. (1985) identified that 84% of physiotherapists who experienced WLBP were treating or handling a patient when they experienced it and 24% identified lifting with sudden maximal load as a contributor. Other handling activities were identified including 20% who identified bending and twisting as the mechanism of injury, though a common written response to mechanism of injury was an insidious onset. Recurrent episodes of LBP were reported by 63% of the respondents. The

clinical environment also impacted with the highest being in acute care (46%) and rehabilitation (24%). Many of the respondents reported an insidious onset and a recurrent nature of their disorder which can be understood in terms of the repetition of multiple factors, at a level lower than necessary to cause immediate tissue damage but which has a cumulative effect over time. The study by Molumphy et al. (1985) took place in USA where work practice and legislation is different to UK, and undertaken in 1985 before the implementation of MHOR (1992) in UK. This could account for the most common reason for injury being treatment/patient handling, which, following 1992, in the UK should have been at best eliminated or at the very least reduced.

Bork et al. (1996), similar to Molumphy et al. (1985) also identified lifting and transferring patients as the biggest job risk factor and the least problematic factor was inadequate training. Bork et al. (1996) investigated the causes of WMSD by measuring the workers' perceptions of the physically stressful elements of their work via a list of seventeen pre-determined conditions which the participants were asked to score on a 0 to 10 Likert scale. Despite there being no evidence upon which the job-factors appeared to have been based studies subsequent to Bork et al. (1996) have tended to use the same list of seventeen pre-determined conditions, as developed and used by Bork et al. (1996), when studying these factors which inevitably means the results will be similar and restricted. It appears that an opportunity to understand the physical risk factors has been limited and is being further compounded by its continuing use.

Holder et al. (1999) reported similar causes of injury including transferring patients, lifting and responding to unexpected movement whilst lifting and twisting were factors most frequently identified by Scholey and Hair (1989). Cromie et al. (2000) modified the use of the seventeen pre-determined conditions list of Bork et al. (1996) to a 3 point Likert scale though the results were very similar to previous work with lifting and transferring patients, treating a large number of patients in a day and working in the same or awkward position identified as main contributors. Similarly, West and Gardner (2001) uncovered little additional information and Glover et al.

(2005) agreed the risk factors most commonly involved were performing the same task over and over, working in the same position and treating a large number of patients. Cromie et al. (2000), also agreed that very few felt that inadequate training in injury prevention was a major contributor.

Rugelj (2004), who did not report basing their risk factor section on Bork et al. (1996), still reported similar results for LBP especially lifting and handling of patients. Additionally Rugeli (2004) suggested that lack of strength and endurance are key factors though there was no evidence upon which to base this assumption and these two factors, though they appear appropriate, cannot therefore be confidently accepted. Adegoke et al. (2008), Campo et al. (2008) and Grooten et al. (2011) also used individually developed questionnaires not specifically based on Bork et al.'s (1996) list of factors and their results confirmed those of the other studies (Bork et al., 1996, Holder et al., 1999, Scholey and Hair 1989. Cromie et al., 2000). Nyland and Grimmer (2003) and Bialocerkowski et al. (2005) each identified an additional factor for physiotherapy students in addition to those associated with treating patients. They found risks associated with being a student, including sitting looking down, significantly contributed to the prevalence of LBP and neck pain.

In addition to the studies where contributory factors to WSD were included with study of prevalence rates studies have been completed which concentrate wholly on identification of contributory and risk factors. Waldrop (2004) identified risk factors as bending and twisting, lifting with sudden maximal load, awkward postures, repetitious movement and using high force which could be correlated to patient activities such as transfers, lifting and responding to sudden or unexpected movement by a patient which replicates what has already been identified so adds nothing new. However, its publication within the CSP's fortnightly news magazine, rather than an academic peer reviewed journal means that it was easily accessible by many physiotherapists which will have increased its impact. Passier and McPhail (2011) carried out a two phase study involving a web based survey followed up by four focus groups with a population of physiotherapists and occupational therapists in Australia which aimed to identify the most

common causes of WMSD through thematic analysis of qualitative data. Although the response rate was only 34.4%, which suggests the potential of a self-selected sample from the invited participants. Despite this research using open questions and qualitative methods, unusual in this field of study, the results showed the four most commonly identified factors were work postures, lifting or carrying, patient related activities and repetitive tasks which exactly replicate previous evidence. Recommendations to reduce the risk factors of WMSD in general, but not WSD specifically, involved behavioural change involving multi-modal interventions. It was not apparent from the study if there was any difference between the professions as each focus group included both professions and the data were pooled which diluted the findings in relation to each profession. Yasobant and Rajkumar (2014) carried out a broader investigation of risk factors for WMSD involving five healthcare professions. The results were remarkably similar to previous studies and included static postures, awkward postures and handling high numbers of patients though the use of non-validated questionnaires, the number of professions involved and the study environment in a tertiary hospital in India meant that this study added little to the understanding of risk factors for physiotherapists in the UK. Vieira et al.'s (2016) systematic review confirms the findings from the studies presented above and identified job tasks, particularly performing manual therapy, lifting and transferring patients as tasks which were commonly associated with physiotherapists developing WMSD.

Despite the limitations of the studies they present some consistently clear physical reasons as causes of WMSDs and WSDs which can be related to posture and loading. It was only Grooten et al. (2011) who identified psychosocial contributory factors and this is an area which has not been extensively researched. Other non-physical, or non-biomechanical factors might contribute to WSD and need recognition.

2.3.3 Non-biomechanical causes of WSD

Factors other than biomechanical and physical have not been well researched and this was the driver for an earlier study regarding Band 5 (entry level) physiotherapists' perceptions of manual and treatment handling

(Coales, 2010). The study used a sequential method where participants, who were all Band 5 Physiotherapists working in a variety of NHS clinical areas, kept a reflective journal for a month which were then analysed to inform and direct two subsequent focus groups. The results identified that the Band 5 physiotherapists expected to acquire a musculoskeletal disorder, most likely spinal, at some time during their career. They felt it was an inevitability considering the work that they did, and they considered this can be because the patient always came first and physiotherapists' safety was a secondary consideration. As a novice physiotherapist they felt that they could not comment on practice or ask for a change in workload if they experienced pain as they felt it may be detrimental to their professional progress. To avoid injury it was identified that they did not intend working in certain clinical areas again in the future and that they did not envisage being a physiotherapist for the whole of their career. These results show that whilst there are obviously issues around the physicality of the work there are also issues around physiotherapy culture which impact on Band 5s' perceived concerns about treatment handling. This supported Cromie et al. (2002) who showed, following interviews with physiotherapists with WMSD, the physiotherapists believed they were "knowledgeable and capable" and that they were unlikely to experience WMSD as they knew "the right way to do things". They considered physiotherapists were "caring and hard-working" which can result in them feeling pressurised to put the needs of the patient before their own. Cromie et al. (2002) suggested cultural views of physiotherapists, and of the profession, can make it difficult for physiotherapists to do their jobs in such a way as to reduce the risk of WMSD. They identified that there can be conflict between the physiotherapists' need to demonstrate hard work and caring and to show their knowledge and skill by remaining injury free. Although this study was conducted in Australia, where the healthcare system differs from the UK, the results can still give cause for concern for those in the UK as it is possible that the professional culture is similar in nature.

Concurring with Cromie et al. (2002) Graham and Gray (2005) established, from focus groups comprising recently qualified physiotherapists they

considered their knowledge and training should prevent injury. In very similar results to Cromie et al. (2002) they also identified that injury prevention strategies were often neglected due to high caseloads and in a bid to appear capable. The moral pressure to put the patient first was also considered an issue in restricting injury prevention, though it was not identified whether this pressure was generated, or perceived to be generated, from internally or externally driven factors. They concluded that there are personal and environmental aspects of working as a physiotherapist which can contribute towards WMSD over which physiotherapists have limited control. Grooten et al. (2011) identified that high psychological demands and low control of the job were considered to contribute to WMSD though unfortunately the number of participants who identified these was too small to calculate any association between exposure to the factor and resultant WMSD.

2.3.4 Summary of studies on causes of WMSD and WSD

The statistics presented in 2.1 identify that physiotherapists are at risk of WMSD and WSD at a rate which can be higher than other occupational sectors. Whilst it is not always possible to differentiate between WMSD and WSD contributory factors to WSD have been recognised to be mostly physical in nature though psychosocial contributors have been acknowledged. Whilst acknowledging the data presented and that staff health may not appear to have been a priority within the NHS there are a considerable number of policies, procedures and legislation in place aimed at maintaining and enhancing safe working practices. The data suggests physiotherapists were at risk of harm during the routine practice of the profession and, in addition to the policies and legislation related to all workforces and work environments, there are professional and legislative measures in place to assist the individual physiotherapist to work in as safe a way as possible.

2.3.5 Prevalence and causes of WMSD and WSD in other therapy professions

It was identified by Molumphy et al.(1985) and over twenty years later by Glover et al. (2005) that research in this field has concentrated on nursing and other health professions have received much less attention. The evidence presented in 2.2 shows the high prevalence rates in physiotherapy

and it is worth considering these rates in relation to other healthcare workers. Comparison to the wealth of evidence on nursing alone can be less informative due to the very different nature of work carried out by each of the different professions.

Karahan et al. (2009) conducted a study of prevalence of LBP in Turkey involving physical therapists, physicians, nurses, technicians, secretaries and hospital aides via a questionnaire consisting of both multi-choice and open questions. The overall response rate was 63% with 1600 out of 2540 hand-delivered questionnaires being returned the following day, though the rate from each staff category varied widely with hospital aides returning 81% but physicians only returning 20%. This variation in response reduces the rigour of the study and findings must be considered with caution. The prevalence of LBP was highest for nurses (77.1%) and physical therapist were second (72.7%). The lowest rate was amongst the secretaries (54.1%) and hospital aides (53.5%) though the rate for physicians was not reported. The exclusion of the physicians' rate can strengthen the confidence of the other reported rates. The contributing factors identified by the nurses and physical therapists were very similar to previous studies and were all patient directed activities, including lifting, spinal rotation when weight bearing, transferring patients and ambulating patients, to which the secretaries and aides were not exposed. Although the choice of contributory factor was pre-determined by the questionnaire's design it, nevertheless, supports the prevalence rate's relationship to patient activity.

Occupational therapy (OT), a profession which has similar aims to physiotherapy in terms of promoting rehabilitation and patient independence was involved in two studies involving the two professions (Darragh et al., 2012 and Islam et al., 2015). Darragh et al. (2012) used a questionnaire based upon previous studies (Campo et al., 2008, Holder et al., 1999) which was sent to 477 occupational therapists and 681 physical therapists in Wisconsin, USA. The response rate was 35.5%, which was low in comparison to studies previously described for physiotherapy (Molumphy et al., 1985, Bork et al, 1996, Holder et al., 1999, Glover et al., 2005), which represented a self-selected cohort of those who had experienced self-

reported WMSD possibly creating a bias in the sample. Prevalence rate was similar between the two professions at 13.5% for WMSD and over half (53%) of the self-reported injuries were associated with the low back. The highest rate of injury was in out-patient rehabilitation (38.6%) and represented thumb conditions in physiotherapists and the second was in paediatrics (19.4%). The questionnaire addressed contributory factors via pre-determined answers and open questions which identified factors similar to those previously recognised including repetitive movements, awkward postures and sustained postures, sudden unexpected patient movement and environment. The similarity could be resultant from the use of a questionnaire based on those used in previous studies (Bork et al., 1996, Holder et al., 1999). The data for both professions were combined and therefore no comparison between them was able to be made, therefore it was unable to determine if there was differences in prevalence rate and causes. Islam et al. (2015) used a convenience sample of thirty nine occupational therapists and sixty two physical therapists in urban and rural Bangladesh, 63% of whom had less than five years' experience. The skill mix of participants in each profession does not reflect that of the UK and, as such, the findings of 95% prevalence of pain, of which 89% was LBP, 70% upper back and 65% neck pain, in both professions cannot be extrapolated to UK professionals. The authors recognise the discrepancy between their study participants and those of other studies (Cromie et al., 2000, Darragh et al., 2012, Glover et al., 2005) which was related to the stage of development of the professions within their country. Alnaser (2015) studied the prevalence and response to WMSDs of OTs in Texas via a survey based upon Holder et al. (1999). Although the return rate was less than in other studies at 36%, which suggested a self-selection bias, the results were closer to results for physiotherapy than previous studies on OT. Although slightly lower than physiotherapy prevalence with a twelve month prevalence of 23% experiencing WMSDs and the low back (32 %) was the most injured body part. Response to injury was similar to physiotherapy with 21% improving their body mechanics, 15.7% limiting their area of practice and 12.3% limiting patient contact. The latter two responses can have an impact on the career opportunities for the individuals and impact on the quality of patient

care. Trigger factors reflect those of previous physiotherapy studies, which was to be expected due to the survey tool being based on a previous questionnaire (Holder 1999), and included lifting and transferring patients, maintaining prolonged postures and performing tasks repetitively. Karahan et al. (2009) showed a poor response rate from physicians in relation to other healthcare workers in their study with medical staff returning 20%, nurses 72%, physical therapists 65%, technicians 70%, secretaries 68% and hospital aides 81%. Falavigna et al. (2009) specifically studied physiotherapy and medical students' prevalence rates of LBP using a self-administered questionnaire in Brazil. Two hundred and nine participants from each student group completed the questionnaire which showed that physiotherapy students were 2.5 times more likely to experience LBP than medical students. The physiotherapy student group had a higher female proportion (81.6%) than the medical student group (40.1%) which could partially explain the difference in prevalence rate as it is recognised that females are more likely to incur WSD than men, though the large difference between the student groups can also be explained by other factors not explored in this study but extrapolated from other studies. The authors suggest that preventative measures should be taken in the physiotherapy student education but as the level of manual handling training within undergraduate physiotherapy programmes in Brazil is unknown the comparison of these results to those in the UK may not be appropriate.

Table 2 presents, in table form, the evidence about prevalence rates of WSD in the physiotherapy and other healthcare professions, from the 1980s to date, demonstrating the lack of change in prevalence of WSD in physiotherapy during those decades.

		Medical students 40% Physio students 81% (Falavigna et al., 2009)				
2010s	56% (Grooten et al., 2011) 53% (Darragh et al., 2012) 66% (Vieira et al., 2015) 89% (Islam et al., 2015)	Occupational Therapy 53% (Darragh et al., 2012) Occupational Therapy 89% (Islam et al., 2015) Occupational Therapy 32% Occupational Therapy Assistant 20% (Alnaser, 2015)	21% (Grooten et al., 2011) 35% (Vieira et al., 2015) 70% (Islam et al., 2015)		40% (Grooten et al., 2011) 61% (Vieira et al., 2015) 65% (Islam et al., 2015)	Occupational Therapy 65% (Islam et al., 2015) Occupational Therapy 9% Occupational Therapy Assistant 13% (Alnaser, 2015)

TABLE 2: PREVALENCE RATES OF WSD IN THE PHYSIOTHERAPY AND OTHER HEALTHCARE PROFESSIONS, FROM THE 1980S TO DATE

From the evidence above it remains unclear whether physiotherapists are more likely to suffer WSD than health professionals other than nurses and a further study would be beneficial to identify the extent of the issue.

2.4 The impact of WMSD and WSD

It has been well established in the literature that physiotherapists have a high prevalence of WSD and the WHO has suggested that, protecting the

occupational health of healthcare workers is critical to having an adequate workforce of healthy health personnel to care for the population (WHO, 2014). Studies (Molumphy et al., 1985, Scholey and Hair 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, West and Gardner, 2001, Salik and Ozcan, 2004, Glover et al., 2005) have identified that despite high rates of WMSD many physiotherapists continue to work whilst in pain and the impact of this is important in relation to both the individual and the physiotherapy service provider.

Campo and Darragh (2010) used focus groups and a supplementary questionnaire to explore the impact work-related pain had on nineteen physiotherapists and occupational therapists in the USA. Although the inclusion criteria was work-related pain in any region eight of the nineteen experienced LBP, six upper back pain and five neck pain. The findings from this study showed that the impact of work-related pain was for therapists to continue working with pain until a time when they were unable to perform to their professional ideal at which stage they felt they could not continue. To continue as long as possible they adapted their work habits but this caused increased work-related pain that then impacted upon their life outside of work. At the stage that their work and home life are impacted upon by the work-related pain they reconsidered their options. The impact of changes in work habits on quality of care is unknown though loss of clinicians to other work options clearly negatively impacts on patient services. Campo and Darragh (2012) continued their exploration of the impact of WMSD during a study on the impact of presenteeism (the practice of a person being present at their place of work) in physical and occupational therapists in the USA. A postal survey was sent to one thousand randomly selected members of both the American Physical Therapy Association and American Occupational Therapy Association. The 72% response rate created a wide representation of both physical and occupational therapy members in terms of demographics and work location. Although it is known that therapists work with work-related pain its presence was associated with high levels of impairment of presenteeism with between 5% and 7.5% reduction in work output for a therapist with moderate WMSD who also lost productive time.

Campo and Darragh (2012) identified that therapists would not reduce the number of patients that they see but would adapt their practice to accommodate their WMSD resulting in compromised patient care. They concluded that reductions in presenteeism of up to 7.5% could potentially represent substantial cost implications for the service provider and that methods to assist therapists to manage their WMSD could improve presenteeism.

2.5 Risk reduction

The suggestion by Campo and Darragh (2012) regarding assistance to manage WMSD should be extended to include methods to reduce risk as well as those to assist once WMSD is apparent. There are factors, both legal and professional, in place to assist physiotherapists reduce their risk of WSD though there has been limited research into the efficacy of these.

2.5.1 Professional measures to reduce risk

Practicing physiotherapists within the NHS are required to be members of the regulatory body for the profession - the Health and Care Professions Council (HCPC) (formerly Health Professions Council HPC) - and have a statutory requirement to comply with their structures and standards.

Although not mandatory when working within the NHS many physiotherapists also belong to the professional body – the Chartered Society of Physiotherapy (CSP) – and then they have a professional obligation to adhere to the CSP's rules and standards.

The HCPC requires registered physiotherapists to adhere to two strands of standards; a generic set of standards applicable to all professions regulated by the HPC (HPC, 2008) and a profession specific set (HPC, 2007). The Health Professions Council: Standards of Proficiency – Physiotherapists (HPC, 2007) have been produced for the safe and effective practice of physiotherapy and represent the minimum proficiency standards. It is clear from the Standards that the individual has a personal requirement to work within their scope of practice, need to maintain their own knowledge and skill level and apply this in a safe fashion. Within the NHS mandatory Manual Handling training allows physiotherapists to maintain currency in this field. Other aspects of continuing professional development (CPD), which is

incumbent on each individual, can involve aspects of safe working practice. Each physiotherapist is required to establish and maintain a safe working environment and to ensure that they are fit to practice although there is no definition of what these terms truly represent.

The CSP also has two strands of standards which reflect those of the HCPC aiming to address professional issues as well as levels of competency. Of the eight basic CSP Rules of Professional Conduct 2002 (CSP, 2002a) rule 1 states that “physiotherapists shall only practice to the extent that they have established, maintained and developed their ability to work safely and competently” mirroring the HCPC, and rule 5 identifies that “physiotherapists have a duty to report, to an appropriate authority, circumstances which may put patients or others at risk” (CSP, 2002a p 6). The Core Standards of Physiotherapy Practice (2005) aim to assist in the delivery of safe and effective physiotherapy to patients. The most relevant standards for manual/treatment handling are number 16, “Patients are treated in an environment that is safe for patients, physiotherapists and carers (CSP, 2005 p 42), and number 18, “All equipment is safe, for purpose and ensures patient, carer and physiotherapist safety” (CSP, 2005 p 46).

Despite the statutory and regulatory requirements it is of concern that the prevalence rate of WSD remains consistent in physiotherapy not altering substantially for almost three decades.

2.5.2 Legislative measures to reduce risk

Physiotherapists have an absolute requirement to work within the law of the country in which they practice which aims to protect not only the patient but also the physiotherapist. In the UK the law comes from European Law, Statute Law and Common Law and Dimond (2009) discusses these systems with respect to safe physiotherapy practice and identifies that the current legislation is well placed to protect practicing physiotherapists. The most pertinent of the considerable Health and Safety legislation which is applicable to ensure safe physiotherapy practice is presented in this section.

Health and Safety at Work Act 1974 (HASAWA, 1974) is the principle statute which places duties on both the employer and employee in its aim to

ensure safety. The employer has to “ensure, so far as is reasonably practicable, the health, safety and welfare at work of all its employees” (HASAWA, 1974, section 2 (1)) whilst the employee must “take reasonable care for his/her own safety and those who may be affected by his/her omission and to co-operate with the employer in performing their duties under the Act” (HASAWA, 1974, section 7a).

The Management of Health and Safety at Work Regulations 1999 (MHSWR, 1999) and the Manual Handling Operations Regulations 1992 (MHOR, 1992) are closely linked and need to be considered in conjunction with each other. The MHSWR 1999 require the employer to assess the risks to their own employees and others affected by their action and to provide appropriate training. There is, however, an onus on the employee by virtue of the MHSWR 1999 to use all equipment provided in accordance with any training and instruction. This duty placed on the employee does not lessen the employer’s responsibility but it does identify that the maintenance of safe working practices is dependent on both the employer and the employee. The MHOR 1992 apply to all manual handling and requires the employer to identify all manual handling operations carried out and establish which ones involve risk. It is inconceivable that within the practice of physiotherapy all risk can be eliminated and it is clear in the MHOR 1992 (pp 11) that, where this is the case, the employer “makes a suitable and sufficient assessment of all such manual handling operations to be undertaken”. It is clearly defined that it is the duty of the employee to cooperate with the employer to meet health and safety requirements once again emphasizing the two-way nature of safe working practices.

The Provision and Use of Work Equipment Regulations 1998 (PUWER, 1998) require employers to provide safe work equipment which is suitable for its intended use, is maintained in a safe condition and is used only by people who have received adequate training. The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER, 1998) requires the employer to ensure that equipment used for lifting people and loads is suitable and safe for its intended use and for the operator. The Reporting of Injuries Diseases

and Dangerous Occurrences Regulations 1995 (RIDDOR, 1995) call for the reporting of accidents and “near misses” to an appropriate authority.

The UK Health and Safety legislation is the most relevant to safe physiotherapy practice but it is apparent that it is not always effective in maintaining a safe working environment in which to practice physiotherapy, as evidenced by the data in 1.2 and the studies presented in 2.3.

2.5.3 Manual handling, treatment handling, physiotherapists and the law

As section 2.5.2 shows there is legislative protection which addresses issues around work-place risks which in physiotherapy can be linked to the physicality of the job. Manual handling and treatment/therapeutic handling, which are a mainstay of physiotherapy practice and contribute to the physicality of the work, are identified as risk factors for injury for physiotherapists (Bork, 1996) so it is worthwhile confirming what is meant by these terms and how they might impact on practice.

The Health and Safety Executive (HSE) (HSE, 2010) take the definition of a manual handling operation from the MHOR (1992 p 9) as “transporting or supporting a load (including lifting, putting down, pushing, pulling, carrying or moving thereof) by hand or bodily force”. MHOR (1992) advise that the regulations apply to manual handling operations defined as manual handling of loads by human effort, as opposed to mechanical handling. The human effort can be applied directly to the load, or indirectly and can relate to both the transportation and supporting of a load in a static posture.

It can be seen that if these definitions are linked to the descriptions of physiotherapy in 1.1 that, in fact, physiotherapy practice largely involves manual handling. However, physiotherapy practice goes well beyond the definition of manual handling as transporting or supporting a load (HSE, 2010 p11) and therefore further consideration of what physiotherapists are doing during practice is necessary. Handling of patients to aid in their functional rehabilitation is a core skill of the physiotherapy profession. The term manual handling is generic to all industries and services and does not specifically apply to the handling carried out by physiotherapists during the course of their routine practice therefore a term was required which identified

this specific handling operation and the term therapeutic handling evolved. This, however, is not the only term used and others such as treatment handling and rehabilitation handling can, and are, used interchangeably.

Lansdale et al. (1995 p 662) described therapeutic handling as: “The individual is encouraged, guided and facilitated to move, in order to regain postural control and selective movement, and to learn functional motor skills”. This definition is quite clear though broad in scope which might make its application in specific instances limited or difficult. The CSP (CSP, 2008) suggest that therapeutic handling could incorporate the definition of manual handling given by the (MHOR, 1992 p 9) adding to it to include “guiding, facilitating, manipulating, stretching or providing resistance” (CSP, 2008 p 18). Therefore, if this is taken into account, any treatment which involves any force being applied through any part of a therapist’s body to or from any part of a patient’s body constitutes manual handling. If this description is accepted any manual handling involved in a treatment programme can be defined as therapeutic handling and is therefore covered by the legislation regarding manual handling. However, no definitive definition of therapeutic handling is available.

2.5.4 Guidance on manual handling for physiotherapists

Hignett (1994) suggests that most situations in which people are handled should be performed in the safest possible way, but that the nature of treatment handling restricts physiotherapists from the safest handling methods. A High Court judgement in 1997 (Canterbury City Council v Howletts and Post Lympne Estates Ltd, 1997) deemed that the HASAWA 1974 was not intended to outlaw work activities merely because they were assessed as dangerous, but rather that it related to how that work was carried out. The CSP recognized that interventions and treatments involving manual handling are an unavoidable essential core skill of practice and, in a bid to inform their membership of how to practice safely within the legal framework, developed the Guidance on Manual Handling for Physiotherapists in 1998. In response to further case law, in which it was identified that public service workers sometimes have to work at higher, though not unacceptable levels of risk (King v Sussex Ambulance NHS

Trust, 2002) they were revised in 2002 and 2008. Although Guidance on Manual Handling for Physiotherapists (CSP, 2008) cannot be described as the definitive document in light of the constantly changing nature of knowledge and skills related to manual and therapeutic handling, at this point in time it is considered as the prime source of information on manual and therapeutic handling for practicing physiotherapists.

2.5.5 Evidence for risk reduction

Despite the creation of appropriate legislation aimed at safe working practice the evidence presented in section 2.2 demonstrates that the prevalence of WSD remains high. The need to reduce the risk factors was apparent as far back as 1995 when Hignett (1995) studied the postural stress encountered by physiotherapists and concluded that the ergonomic premise of fitting the job to the individual rather than the individual to the job, was unlikely to be possible for physiotherapists. Although this study may appear dated the reasons given for the inability to fit the work to the physiotherapist, those of patient anthropometrics and the need for rehabilitation handling, remain pertinent to this day. Waldrop (2004) suggested that multi-modal interventions would be required to change physiotherapists' behaviour regarding the risk factors thus reducing risk. She suggested practical preventative measures including limiting hours worked to reduce fatigue, asking for help to reduce the load and rotating patient load. Employing a specific staff member to lead the risk reduction programme and the appropriate training in the use of technology (hoists) were also suggested. Although these suggestions appear appropriate there was no evidence to support their implementation. Rockfeller (2008) also suggested the need for adequate training in the use of technology to improve safety. This study was directed at the use of hoists and other handling equipment for the safety of the patient and caregiver and was a narrative which appeared outmoded with respect to universal use of hoists and the mandatory manual handling training, which is required within the NHS. Hanson et al. (2007) identified that the physiotherapy culture was a primary factor contributor to WSD and used a social action model to investigate if culture could be altered to promote risk reduction. They felt that the model could highlight risk factors

and through its use could use a team approach to reduce them. They identified barriers to the implementation of such a model and as it was not implemented the suggested use of a social action model remains entirely theoretical. A review of injury prevention in physiotherapists (Deepak and Ajeesh, 2012) targeted studies that investigated WMSD though not WSD specifically. Of the seventeen studies included in the review all those pertaining to WMSD which included WSD have been presented in this literature. The review was appropriately conducted though its report focused more on the contributory factors than the preventative factors suggested by its title thereby missing an opportunity to inform the physiotherapy profession. The preventative factors which were identified from the review included the proper reporting of WMSD and ongoing ergonomic training.

The quality and the quantity of evidence regarding reduction of risk, and prevention, of WSD in physiotherapy is limited. This area of research which, arguably is more valuable than the identification of prevalence of WSD where research has occurred, requires attention to help inform and direct appropriate risk reduction behaviour in physiotherapists.

In summary physiotherapists in the UK work in an autonomous profession which is inherently physical and with this comes risk of personal harm. Legislation aiming to protect workers is in place and this is supplemented by professional rules and regulations, recognising that both the employer and the employee have responsibilities towards safe working practices and environments. In the case where national legislation can appear to fall short for the specificity of the physiotherapy profession the CSP has interpreted the legislation and produced its own guidelines to assist practicing physiotherapists. Mandatory manual handling training is required for those practicing within the NHS and risk assessment has been identified as a useful tool in reducing risk. However, despite these measures physiotherapists continue to be harmed by the job and the prevalence rate of spinal pain (see 2.2) has remained fairly constant for over three decades.

2.6 Summary of literature review

The prevalence, cause and response to WMSD in physiotherapy in various clinical and geographical areas have been studied (Molumphy et al., 1985,

Scholey and Hair, 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, West and Gardner, 2001, Cromie et al., 2002, Rugeli, 2003, Nyland and Grimmer, 2003, Salik and Ozcan, 2004, Glover et al., 2005, Barnes et al., 2007, Adegoke et al., 2008). Although data was collected, using self-created and/or validated questionnaires, the studies were not directly comparable as their methods were incompatible. Post-hoc self-administered questionnaires were used in all studies though the questionnaires were often different between studies. This style of administration allows access to a large sample population though return rates are notoriously low (Hicks, 1999), though in most of the studies returns were high which might suggest a biased sample, reducing the rigour of the studies. More importantly for these studies the possibility of recall bias and the use of questionnaires non-validated for the population or context can create data which are inappropriate to analyse (Hicks, 1999). The varied samples included physiotherapists, assistants and students though direct comparison of the results of each sub-population is not possible, and only Nyland and Grimmer (2003) acknowledged the different occupational roles that each sub-population can incur. The prevalence rates related to time duration e.g. annual, weekly, were not consistently studied and the type chosen can influence the interpretation. Despite these difficulties the results from all the studies were remarkably similar for prevalence of spinal (cervical, thoracic and lumbar) disorders and as such the combined data can be considered acceptable. The concern raised by this prevalence is augmented as it has not altered since the early investigation by Molumphy et al. (1985).

Work factors contributing to WSD were investigated by numerous researchers and those studies subsequent to Bork et al. (1996) have often cited Bork et al.'s (1996) list as their source of work related contributory factors reducing the scope of this area of study. However, the collective results mirror the retrospective analysis by the National Institute of Occupational Safety and Health (NIOSH, 2014).

Non-physical causes such as cultural views of physiotherapists, and the profession, can make it difficult for them to do their jobs such as to reduce the risk of WMSD (Cromie et al., 2002) which is supported by Graham and

Gray (2005) who suggested there are personal and environmental aspects of working as a physiotherapist which can contribute towards WMSD over which they have limited control.

The response physiotherapists make to injury showed consistency and included change of work practices (Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, West and Gardner, 2001, Salik and Ozcan, 2004 and Glover et al., 2005), change of work setting (Molumphy et al., 1985, Bork et al., 1996 and Cromie et al., 2000) use of additional personnel or aids (Holder et al., 1999 and Cromie et al., 2000) and reduction in patient contact hours (Molumphy et al., 1985, and Cromie et al., 2000). Condition management responses included asking a colleague to treat them or treating themselves (Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, West and Gardner, 2001, Rugelj, 2003, Salik and Ozcan, 2004 and Glover et al., 2005). Many physiotherapists did not seek medical advice or intervention (Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000 and Salik and Ozcan, 2004) nor did they tend to take sick leave but continued to work with pain (Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000). A few took sick leave (Glover, 2005) and Cromie et al. (2000) identified that others left the profession. Cromie et al. (2002) suggest these approaches to WMSD management is linked to the construct that physiotherapists are hard-working and will continue to work when injured to ensure patient care, but that this may be influenced by peer or senior staff pressure. The impact of WMSD and WSD and working whilst it is present has been studied by Campo and Darragh (2010 and 2012) which identified the negative personal and professional impact on the individual and the loss of productivity for the employer.

Although the studies' findings collectively present an unchanging situation for over three decades there is a lack of qualitative data suggesting further qualitative study would be valuable. The findings from the current study will be compared to the previous studies to determine similarities and differences.

The literature review has shown that there is a high prevalence of WSD with the low back, where most of the research is concentrated, being higher than the neck and that there is limited data on the mid-back region. The rates of prevalence do not appear to have changed over the last three decades despite the introduction of legislative and professional measures and the physical factors which contribute to WSD have, similarly, not changed. There has been limited qualitative exploration of the contributory and risk reduction factors and there is a gap in the literature. These issues support the implementation of a qualitative study of the perceptions of physiotherapists, about contributing and risk reduction factors for WSD, involving the whole spine, whilst working in the modern day NHS.

3 Methodology

This chapter explores the use of a qualitative approach to this study. Grounded theory as a concept at its inception by Glaser and Strauss, the divergence of these original grounded theorists and the evolution of constructivist grounded theory is related to this study. The supporting philosophy for the study is presented through discussion of the ontological position of the researcher and the epistemological possibilities in relation to the study design including symbolic interactionism and social constructionism. Theory is discussed and is related to the researcher's positionality. The aspects of ensuring the rigour of the study are also explored.

3.1 Methodology choice

3.1.1 Qualitative paradigm

Coffey and Atkinson (2002) comment that the research question determines the research process and the methodology and methods chosen. The area of interest was that of spinal pain in practicing physiotherapists within the NHS in the UK, more specifically in Wales. My personal interest, experience and research background suggested a quantitative study investigating kinetics and kinematics of routine clinical practice. However, at an early stage of background reading a research question evolved and was subsequently refined over time (see 1.4.1), for which a qualitative research approach was required. Qualitative research is complex and variable in nature and is shared by different frameworks (for example pragmatism and constructionism) and different methods (for example interviews and focus groups) (Creswell, 2007). Hakim (1997) explained that qualitative research is concerned with creating rich data about perceptions, attitudes and behaviours. Data generated is described as holistic and diverse and is produced through unstructured or loosely structured methods with the aim of understanding the social world through peoples' representation of it. Sayer (1992), described qualitative research as being characterized by small, comprehensive studies, is in-depth and explorative of underlying mechanisms behind social life and this paradigm was considered appropriate to answer the study's research question. The qualitative

research paradigm, with its inherent flexibility, is compatible with grounded theory (Strauss and Corbin, 1998) which was the primary framework for this study. An exploration of the development of grounded theory over time and its relevance to this study was required to enable the informed choice of an appropriate grounded theory approach in relation to the ontological stance (3.2.1), the epistemological position of the study (3.2.2 and 3.2.3) and the research question.

3.1.2 Grounded Theory

A grounded theory approach, which was originally described as a complete methodological package (Glaser, 1999), was used for this study with the aim of creating a theory regarding the contributory and risk reduction factors involved in WSD in practicing physiotherapists. Nicholls (2009a) suggested that qualitative research attempts to build theory that is generalizable to others whereas Weaver and Olson (2006) stated a pragmatic approach to healthcare research calls for theory to be designed and tested in practice. Theory design is the fundamental premise of grounded theory which seeks to develop a theory emergent from the data and the need to build theory is dependent upon current levels of knowledge of the study phenomenon requiring an assessment of the existing knowledge (Weaver and Olson, 2006). The existing knowledge regarding WSD in the physiotherapy profession involves evidence, mostly of a quantitative nature (see chapter 2) using self-reported specifically developed, though not always validated questionnaires. This evidence comes from a variety of researchers, in a number of countries worldwide and neither a cohesive body of evidence, nor an active specialised research group is apparent. These conditions limit the depth and quality of the currently accepted knowledge. The limited amount of qualitative evidence does add to the overall evidence base but as there is a restricted amount of knowledge in the field of WSD and physiotherapy, a grounded theory approach suited the study's research question in relation to knowledge.

Glaser and Strauss (1967), the initiators of grounded theory, originally presented grounded theory as an alternative to traditional methods of social

enquiry which, they argued, did not generate theories that were bound to the data. They argued that,

“...the adequacy of a theory... cannot be divorced from the process by which it is generated” (Glaser and Strauss, 1967, p 5).

Glaser, a positivist, and Strauss, a pragmatist presented the original form of classic grounded theory (Glaser and Strauss, 1967) by creating a systematic qualitative methodology, even though it was based upon a positivist quantitative background, which advocated developing theories grounded in data rather than testing hypotheses derived from already existing theories (Robson, 2002). Grounded theory is characterised by a number of distinct features most specifically the joint process of data collection and analysis, and theoretical sampling which allows the researcher to,

“move easily from what they see and hear and to raise that to a level of the abstract, and then to turn around again and move back to the data” (Glaser and Strauss 1967, p 8).

Strauss and Corbin (1998) suggested that a grounded theory researcher needed to be flexible, creative and willing to ask questions to develop the two way process between the data and the theory. They suggested therefore, that a grounded theory approach starts with an area of study, in this study that of spinal pain in physiotherapists, rather than a preconceived idea and it is likely that it can develop in different directions. Further supporting the use of grounded theory in this study Glaser (1999) suggested grounded theory is a methodology suited to Masters and Doctoral students as it can develop theories relevant to their practice, and it is also advocated within physiotherapy (Mellion and Tovin, 2002). The relevance of this study's topic within physiotherapy and in a Doctoral context supports grounded theory's suitability though, as several grounded theory approaches have developed since its inception, an understanding of the different approaches of grounded theory is required. To choose an appropriate approach of grounded theory, in relation to this study's epistemological and ontological background, the history of its inception and development is necessary.

3.1.3 The history and approaches of grounded theory

Since its inception in 1967 there has been a development of the grounded theory concept and a divergence between its two original instigators. Glaser has remained consistent with the original positivistic methodology and this school of grounded theory retains positivistic attributes including methodological reproducibility, generalizability to a wider population and an attempt to reduce researcher bias. Conversely, Strauss moved further towards a more qualitative style with interpretation and verification of data.

The divergence in grounded theory approach may be based in the individual backgrounds of the founders of grounded theory Anselm Strauss and Barney Glaser. Barney Glaser came from a strong positivist tradition background and studied quantitative research methods at Columbia University. This positivist background may have influenced his concept of the grounded theory process and, since its inception in 1967, Glaser has remained consistent with the original positivistic methodology. The Glaserian approach to grounded theory retains its positivistic attributes including methodological reproducibility, generalizability to a wider population and an attempt to reduce researcher bias. Anselm Strauss studied at the University of Chicago where he came under the influence of symbolic interactionists, including Herbert Blumer, which may have impacted on his conception of grounded theory (Jeon, 2004). Under the guidance of pragmatist John Dewey, Herbert Blumer and George Herbert Mead developed the concept of symbolic interactionism which was identified as an appropriate epistemological position for early grounded theory (Strauss and Corbin, 1998). Whilst retaining the background concept of symbolic interactionism Strauss moved further towards a more qualitative style which was enhanced by his work with Corbin who advocated this variation on the original methodology (Strauss and Corbin, 1998). Despite the shared background of symbolic interactionism the differences in approach between Glaser and Strauss, with Corbin's support, both display positivist traits with the assumption of an objective, external reliability that can be discovered and, to varying degrees advocate the use of rigorous methods to reduce researcher bias (Charmaz, 2000). However, together they developed a rigorous systematic process of

qualitative research with characteristics of both positivism and symbolic interactionism (Charmaz, 2000). The grounded theory process was instrumental in raising the profile of qualitative research as qualitative research had long been marginalised and grounded theory attempted to address the theory-research divide (Charmaz, 2002, Jeon, 2004). The divergence of the originators of the process meant that Glaser retained the idea of an unbiased researcher discovering data and generating theory whereas Strauss and Corbin acknowledged the need to give the participant a voice and that it was acceptable that the views of the researcher can differ from the views of the participant. However, despite Strauss and Corbin's (1990, 1998) leanings towards post-positivist tendencies, all three proponents of grounded theory (Glaser, Strauss and Corbin) still retain aspects of positivism (Charmaz, 2000). These approaches have been termed objectivist grounded theory, and, although they appealed to me in terms of a structured approach which, to an extent reflected my quantitative positivist research background, I felt they were too restrictive given my personal experience and knowledge of the study topic.

3.1.4 Constructivist Grounded Theory

Both Glaser's and Strauss' approaches of grounded theory, have continued to evolve as the process was adopted by researchers with different ontological and epistemological positions. A more interpretive approach was being developed further with a more flexible approach to all facets of the methodology with an epistemological background of social constructionism (Clarke, 2005, Charmaz, 2006, Mills et al., 2007, Tavory and Timmermans, 2009, Bryant and Charmaz, 2007). One significant version of the interpretive approach comes from Charmaz (2000), termed constructivist grounded theory, which she describes as: "constructivism assumes the relativism of multiple social realities, recognises the mutual creation of knowledge by the viewer and the viewed, and aims towards interpretive understanding of subjects' meaning" (Charmaz, 2000 p 510).

Constructivist grounded theory can be seen as a middle ground between positivist and post-modern thinking (Charmaz, 2000) by putting the emphasis on the phenomenon under study and considers that both data and analysis

are created by the shared experiences of the researcher and participants, and therefore the researcher identifies him or herself as an inextricable part of the process (Charmaz, 2006). Although evolved from the objectivist grounded theory approaches of Glaser, Strauss and Corbin and grounded theory's associations with symbolic interactionism, constructivist grounded theory's emphasis on meaning moves it into the realms of interpretative research. Charmaz (2000) identified that the component parts of grounded theory – simultaneous data collection and analysis, theoretical sampling, theory rather than description and comparative analysis – can still be used but will create a theory which she likens to a “painting” rather than the positivist pursuit of a theory which objective grounded theorists would liken to a “photograph”. This joint creation between participants and the researcher is reflected in the epistemology underpinning constructivist grounded theory - social constructionism (Charmaz, 2006) which is a theoretical approach based on people constructing their own social world based on meaning and motives.

Table 3 highlights the differences between the approaches of grounded theory to enable comparison.

Grounded Theory Approach	Objectivist Grounded Theory (Glaser and Strauss 1967, Glaser 1978, 1992)	Constructivist Grounded Theory Charmaz 2000, Clarke 2005, Charmaz 2006, Bryant and Charmaz 2007
Underpinning epistemology	Symbolic interactionism	Social constructionism
Role of researcher	Objective and detached	Interactive, participatory, reflexive
Analysis	Codes and categories passively <i>emerge</i> from the data	Codes and categories are actively <i>co-constructed</i> through an interpretive process
Theory	The theory is able to be <i>discovered</i> and will represent the facts of a real and external reality	A theory is <i>constructed</i> and represents a construction of multiple realities

TABLE 3: THE MAIN DIFFERENCES BETWEEN OBJECTIVIST AND CONSTRUCTIVIST GROUNDED THEORY

Although table 3 highlights the differences between the grounded theory approaches each could have been incorporated into this study though more compromise would have been required to accept the restrictions of an objectivist approach. Nevertheless the different approaches do retain similarities around the key components of a grounded theory approach which include the use of theoretical sampling, the data collection and analysis are a combined activity which occur simultaneously which drive further theoretical sampling, there is a constant comparison of the data throughout the analysis and the end results in either the theory for an objectivist approach or a theory for a constructivist approach.

3.2 Philosophy of grounded theory approaches

To establish harmony within a qualitative study the relationship between ontological and epistemological positions should be complementary and reflect both the individual researcher and the values of the chosen study design approach. This section therefore discusses the ontological position of the researcher and the different epistemological backgrounds of different approaches of grounded theory. The development of grounded theory approaches and the choice of approach used for this study in relation to ontology and epistemology stances is discussed in 3.1.2. and 3.1.3 and is subsequently presented in 3.2.

3.2.1 Ontology - pragmatism

Pragmatism was developed in the United States of America from the work of Peirce in the 1930s when it was described as a method of reflection with the purpose of making ideas clear (Crotty, 1998). Pierce's work remained relatively unknown until James and Dewey proposed a newer version of pragmatism in the 1950s. The essential difference between Pierce's view of pragmatism and James and Dewey's view was that James and Dewey's version was seen to be less critical in its approach as they considered that pragmatism was about exploring the world not criticising it (Crotty, 1998). Creswell (2007 p 22) suggested that although there are various forms of pragmatism all are based on a similar concept which is a concern with the outcome of the research rather than the antecedent conditions. Therefore what is seen as important is the problem being studied and the research

question being asked, rather than the worldview of the researcher and, as pragmatism is not restricted to any one philosophy and reality, it gives researchers freedom of choice in terms of methods to meet their needs (taken from Cherryholmes, 1992 and Murphy, 2000). This means that a pragmatic researcher will use whatever methodology is best suited to answering the posed question. The development of the research question and methodology exploration for this study identified that what was important was the topic of interest and the evolved research question rather than a specific research approach, thus fitting with a pragmatic viewpoint. Robson (2002), concurring with Bryman (2008), suggested that the pragmatic approach is very feasible as the current values of qualitative and quantitative paradigms are much more compatible than may be initially assumed. Pragmatism has many of the components of a realist viewpoint of research described as; no facts are beyond dispute, the aim of science is to invent theories to explain the real world, explanation is concerned with mechanisms in reality, laws are statements of things which are really happening, social reality incorporates individual, group, institutional and societal levels, explanation is showing how an event has occurred in a particular case (Robson, 2002). Weaver and Olson (2006) conclude that a pragmatic approach to nursing and healthcare research is appropriate as it has a commitment to what works in practice which further supports my ontological stance. As the methodology had to be able to address the question and a pragmatic ontology was meaningful for healthcare study, the appropriateness of my ontological position as pragmatism was valuable. Whilst this supported the use of grounded theory in the study an understanding of the concepts of symbolic interactionism and social constructionism was necessary to support the choice between an objectivist or constructivist grounded theory approach (see 3.5).

3.2.2 Epistemology – symbolic interactionism

As symbolic interactionism was derived from pragmatism, and is the epistemological philosophy supporting objectivist grounded theory an understanding of pragmatism in relation to a researcher and the choice of qualitative paradigm for a study must be considered. Blumer (1969)

identified that there are three premises for symbolic interactionism: human beings act towards things on the basis of the meaning the things have for them, the meaning of such things is derived from, or arises out of, the social interaction one has with one's fellows and these meanings are handled in, and modified through an interpretive process. In the context of social interactionism what a person does is constructed through interaction with others, their culture and themselves which leads to a new construction and line of action resulting in revision, acceptance or rejection of behaviour (Blumer, 1969). These interactions will only lead to change if the individual perceives this as important. In addition to the individual Crotty (1998) and Flick (2009) suggested other crucial aspects of symbolic interactionism are that the researchers, to the best of their ability, need to take the standpoint of those being studied, and that the interactions always take place within a particular contextual position. The researcher is required to put themselves in the place of those being studied and so become aware of their perceptions, feelings and attitudes. Through dialogue and interpretive analysis the meaning and intent of those studied can be derived. The context of this study was physiotherapists with WSD practising within the NHS. This study's researcher was a physiotherapist who had experienced WSD and could therefore be seen as well placed to recognise and understand the perceptions, feelings and attitudes of the participants as they evolved through the data collection and analysis stages of the study. Her positionality however, could conceivably influence both data collection and interpretation though, if the situation was acknowledged, it does not preclude appropriate process to allow her to put herself in the place of participants and so become aware of their perceptions, feelings and attitudes. Although this would have been possible with judicious use of reflexivity it would have required her to "get inside the heads" (Charmaz, 2000) of participants and attempt to accurately relay their information which could have been challenging in view of her own pre-conceived ideas and sensitisations resulting from personal experiences and knowledge. Therefore although symbolic interactionism supports the use of objectivist grounded theory and it would have been possible to adapt to its constraints it was not an ideal choice. It was therefore

valuable to consider other epistemological backgrounds related to the approach of grounded theory.

3.2.3 Epistemology - social constructionism

The underpinning epistemology for constructivist grounded theory is social constructionism. Constructivist grounded theory accepts that a study relies on co-creation between researcher and participant which is supported by Searle (1995) who suggested that things are only understood by virtue of human agreement. In this study concepts, such as physiotherapy and WSD, were understood by mutual agreement between the researcher and the participants and the wider healthcare context. Searle (1995) described other aspects as institutional as they require human institutions for their existence. In this study the physiotherapists were working within the institution of the physiotherapy profession, the understanding of which is constructed by those within and outside of it. The understanding of other factors which were fundamental to this study, including the concept of pain and injury, physiotherapists' perceptions of causes of WSD, were constructed as a result of individual's and group's experiences. Realities can be both individually and/or collectively constructed and each individual attaches their own meaning. Within this study individual constructions included the participants' construction and interpretation of pain whereas collective construction involved professional issues such as interpretation and acceptance of professional rules and intra-professional appreciation of knowledge of the profession. In this way the prevailing culture within any institution will effect and affect those aligned to it. Social constructionism reflects this and Burr (2003) described four basic assumptions which represent it. Table 4 identifies the four assumptions of social constructionism and suggests how these assumptions could be accommodated within the study.

Assumptions of social constructionism (Burr, 2003)	Interpretation of social constructionism assumption framework within the study
1. A critical stance is taken towards taken-for-granted ways of understanding the world	<ul style="list-style-type: none"> • Researcher and participants to reconsider their understandings of WSD currently based upon incomplete knowledge and assumptions. • This allows for the construction of knowledge through interaction and the use of language collectively and individually
2. Historical and cultural specificity	<ul style="list-style-type: none"> • The knowledge constructed relates to physiotherapists with experience of WSD working in the NHS in South Wales. • The larger cultural construct of the physiotherapy profession can provide some continuity across different settings • The cultural setting of the NHS can provide some continuity across different professions
3. Knowledge is sustained and generated by social process	<ul style="list-style-type: none"> • Knowledge generation is dependent on social processes. What is currently accepted is seen as the truth adding stability • The most dependent social process is language • Physiotherapists routinely use language and are a socially active group • Enables active discussion between researcher and participants and gives an opportunity to generate new understanding of WSD
4. Knowledge and social action go together	<ul style="list-style-type: none"> • Constructions created by a group invite a reaction to them. Relates to group dynamics within a population and individual and group response • Physiotherapists with WSD could involve a hierarchy of members in terms of professional status and power • Response can involve medical support sought, sickness absence and managerial response to their WSD • Relates to the potential action/s following the creation of a theory developed in conjunction between the researcher and participants

TABLE 4: SOCIAL CONSTRUCTIONISM WITHIN THE STUDY

The use of social constructionism as an epistemological stance supporting this study reflected my ontological position of pragmatism in preference to symbolic interactionism and allowed a freedom to interact with the

participants to create meaning and understanding. This epistemological position valued my previous experiences and sensitising views which were seen as beneficial to the study. This was therefore accepted as the epistemological position which directed the need to understand the approaches of grounded theory to ensure that the compatibility between ontology and epistemology extended to the choice of methodology to address the research question of this study.

3.3 Theory development and choice of grounded theory style

The aim of any grounded theory study, regardless of whether it is of an objectivist or constructivist approach, is to generate a theory regarding the topic under investigation, therefore, an understanding of aspects around what constitutes theory in relation to the approaches of grounded theory was necessary. A common criticism of GT is that it produces low-level theory (Layder, 1998) though Charmaz (2006) feels that with careful consideration of the component parts of CGT and an understanding of what constitutes theory, strong substantive theory can be developed. This section will explore these aspects in relation to this study to enable the execution of a sound study. A constructed substantive theory for the perceptions of physiotherapists regarding contributory and risk reduction factors for work-related spinal disorders within the profession will be presented in Chapter 5 section 5.4.

In the methods chapter, section 3.3, constituents of a theory were briefly explored in relation to choice of style of GT. In their seminal book which launched GT Glaser and Strauss (1967) explained that the aim of GT is to generate or discover theory, whilst simultaneously recognising that the generation of new theory had to be bound to the data and that GT did not aim to verify, as they termed it, grand theory. Kelly (2010) additionally identified that the quality of new theory requires it to be clear, structured, coherent and pragmatic in application and to provide a better understanding of the topic. It is therefore worth considering what a theory actually is. At its basis a theory involves some constructs, a relationship between them, which need not be causal but which must be plausible, and a method of

representation and Gregor (2006) suggests how these components are incorporated into GT (table 5).

Theory component	Definition	How used in Grounded Theory
Means of representation	Must be represented in some physical way – eg. words, symbolic logic diagrams, tables or graphs	Often represented by a narrative framework, diagram or statements of hypotheses
Constructs	All the primary constructs in the theory should be well defined. Construct definition can be observational, theoretical or collective	All constructs in a grounded theory come from the data. For a more coherent theory aim for one or two core constructs
Statement of relationships	Showing relationships between constructs. These may be of many types, associative, uni-directional, bi-directional, conditional or causal	Theory is often based on qualitative data and therefore relationships are not often causal
Scope	Specified by the generality of the statements of relationships	The aim is to produce substantive theory that pertains to the investigation area. Generalisability can be extended by theoretical sampling

TABLE 5: COMPONENTS OF A THEORY APPLIED TO GROUNDED THEORY (TAKEN FROM GREGOR, 2006)

In addition to the basic premise of a theory as described by Gregor (2006) a clear understanding of broad descriptions of what theory is, from wider sociological backgrounds assists in developing sound theory in GT.

Definitions of theory primarily derive from positivism which suggests it is a statement of relationships between abstract concepts covering a range of empirical observations. Operational definitions are created for the concepts from which hypothesis testing is carried out using empirical measurement. Positivist theory seeks out causes and explanations and theories which can explain and/or predict. Simplicity, generalizability and universality are the desired outcome of a theory which can be tested and used in different situations, which represents the objectivist theories produced by Glaser and, to a lesser extent Strauss and Corbin. Charmaz (2006) suggests that the frugality of a positivist theory has certain qualities including specifying and

explaining the relationships between variables, the systemisation of knowledge and the generation of hypotheses for research, although they can result in narrow explanations which in themselves generate simple points of action. These objectivist, more positivist, approaches of grounded theory require the researcher to enter the theorising devoid of pre-conceived ideas and to bring an objective view to the research even to the extent of not engaging with the literature on the phenomenon.

An alternative to positivist theory creation is found in the desire to understand rather than simply explain concepts. Exploration of interpretive definitions of theory identified their differences from those of positivism as the understanding is determined by the theorist's interpretation of the concepts without the requirement to explain the concepts or prove causality. In this way there is room for uncertainty which is based on an assumption that there are multiple realities, truth is provisional and facts and values are linked (Charmaz, 2006). As previously suggested Kelly (2010) identified that the quality of new theory requires it to be pragmatic in application which Ritzer and Goodman (2004) suggested is supported by the use of sociological theory as it has a far-ranging scope, has wide applications and deals with issues of social life and suggested that there is a strong interpretive element. In constructivist grounded theory, theory is derived from the data and remains firmly anchored in them and to achieve this rich data is required. It would not be necessary for a theory, grounded in the data to have a sample which is generalizable, as is desirable in objectivist grounded theory, but the theory itself should be generalizable to other settings (Hood, 2007). This approach goes beyond just looking at how individuals view their situation and acknowledges that the resulting theory is an interpretation dependent on the researcher's and participants' view, suggesting a cultural element may be involved.

Alasuutari (1996) added a further dimension which needs consideration when constructing a theory from a GT study – that of cultural theory.

Alastuutari (1996) suggested that the theorist (the researcher) examines the lay-persons' (the participants) concepts of the phenomenon under study and thus takes interpretation into a realm of deconstruction of phenomena in an

effort to understand that phenomenon's concepts. To him theory provides an interpretive frame from which to view realities, and recognises that the researcher's and the lay-person's frames, whilst each makes sense to them, may be different from each other.

As GT has evolved over the last five decades it is worth considering more closely how theory and its development relate to this evolution of GT. Objectivist grounded theory (OGT) has its basis in positivism and therefore considers the data to be real thus ignoring the context of the data, the influence of the researcher and the relationship between participants and researcher. In OGT a researcher assumes the data are already known in the world and that it is the researcher who discovers theory from them. This approach to GT requires the theorist to enter the theorising devoid of pre-conceived ideas (Glaser and Strauss, 1967, Glaser, 1978, Corbin and Strauss, 1990). To achieve this it is assumed that there is an external reality which awaits discovery and that the theorist is an unbiased recorder of the facts and thus careful adherence to OGT processes will produce theoretical understanding. In OGT therefore the data is treated as being separate from the researcher and that there is no influence of the theorist on the discovered theory (Glaser, 2002). He suggested in 2002 that if, by mistake, there is an influence from the theorist this can be overcome, and the data rendered objective again, by increasing the number of participants, which contradicts his earlier stance of non-representative small samples in a study. The OGT process, in ignoring the influence of the researcher, the context and the participants has the potential to discover limited theories (Charmaz, 2006, Alastuutari, 1996, Urquhart, 2013) which lack scope (Gregor, 2006). A constructivist approach however, puts the emphasis on the phenomena of the study and considers the data and their analysis as being created from a shared experience (Charmaz, 1990, 2000, 2002a, Mitchell and Charmaz, 1996). Through this it is felt that the theory is dependent upon the researcher's view and cannot be separated from it, and this enables a deeper theory which has wider scope as it is able to establish to what extent the experiences are embedded in wider situations and networks (Charmaz, 2006). CGT theorists suggest that theories created from an interpretivist

approach can be placed contextually in time, place, culture and situation (Bryant, 2002).

As has already been identified theory derived from GT studies is often criticised for its low level. Layder (1998) suggests that this may be as a result of the coding in GT starting at word-by-word or line-by-line analysis which, although aimed at accessing the richness of data, can lead to multiple low-level concepts leading to a concentrated micro-theory. Therefore, to avoid this criticism, the level of theory needs to be considered.

Urquhart et al. (2010) suggested that grounded theories existed at different levels of abstraction which have a relationship with the degree of conceptualisation that occurred in creating the theory. They suggested that the commencement of any GT study is based on a bounded context regarding the phenomena of interest, which does not come from the data – in this study my idea that physiotherapists who had experienced WSD may have opinions about why WSD might happen within the profession would represent a bounded context. Data are then collected and a substantive theory is developed from which formal theory can evolve. They created a framework (Figure 1) to represent the levels of grounded theory.

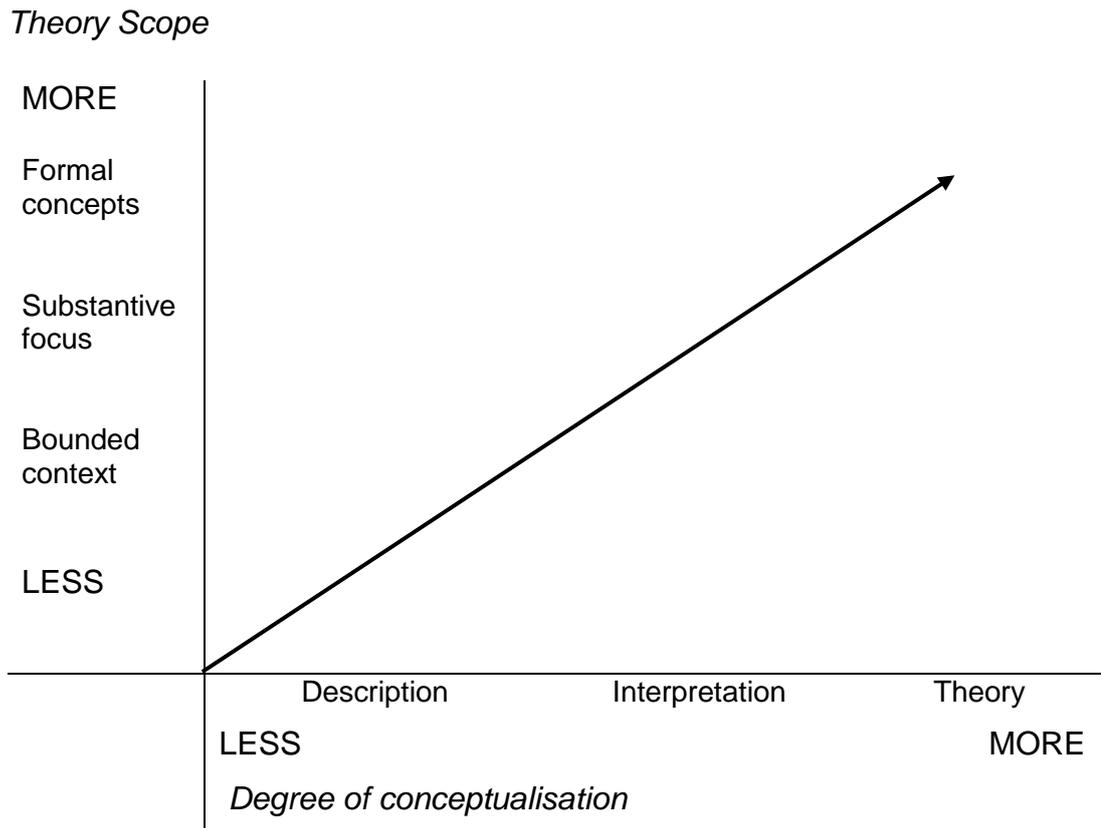


FIGURE 1: THE SCOPE AND DEGREE OF CONCEPTUALISATION OF THEORY (URQUHART ET AL., 2010)

However, Urquhart et al. (2010) advised caution when using their framework as it, in itself is a substantive theory based in information systems, which has not been tested or applied in different disciplines. However, in the absence of other frameworks for grounded theory it could be applied to this study with due caution.

Substantive theory is defined by Urquhart (2013 p 193) as “the type of theory that GT produces in the first place. It is substantive in the sense that it pertains only to the phenomena being studied and makes no claim to generalise beyond the particular phenomena”. Although their framework suggested that a substantive theory is a stepping stone to a formal concept which appears, initially, to contradict Gregor (2006) who suggested that the aim of a GT study is to produce substantive theory that pertains to the investigation area. However, accepting Urquhart et al.’s (2010) cautionary note regarding their own framework being a substantive theory, which has not been tested in other disciplines, it could be seen to agree with Gregor

(2006) who advised that generalisability can be extended by theoretical sampling.

Urquhart (2013) suggested that, to avoid Layder's (1998) criticism that GT produces micro-phenomena as a result of its coding style of bottom up, it must be recognised that the coding process is an iterative and reflective one which aims to be analytical and not just descriptive. This approach was accepted for this study and consideration of it was undertaken in the methodology. Thus, theorising starts at the coding stage in order to consider the meaning and interconnections of the codes that evolve. This is achieved through grouping the codes together, consideration of the names attributed to codes and whether they are truly representative and considering the relationships between the codes all of which is supported by reflective and theoretical memos (Chapter 4, table 8 and 9). Theoretical memos, and to a lesser extent, reflection allows a distance between the theorist and the data which enhances the abstraction by allowing distinction between the process of coding and the creativity required for theorising. Glaser (1978) suggested rules for memo writing which Charmaz (2006) developed and this overlapping of coding and theoretical memo writing is what allows the building of the theory. Bryant (2007) suggested a further criticism of theory from GT studies by suggesting that they can be de-contextualised and inductive though Charmaz (2005) counters the argument by suggesting that the constructivist approach of a CGT study would reduce this as it considers who the theorist is and what authority they have to do it (this is considered in this study in Chapter 3, 3.4). This approach would be supported by Alasuutari's (1996) thoughts on cultural theory and Neil's (2006) views on co-constructed theory. Charmaz (2005, 2006) refuted the objectivist criticism of Bryant (2007) and Layder (1998) and advised that a CGT study can construct new theory. Theorizing in CGT means stopping and thinking (Charmaz, 2006) seeing possibilities, establishing connections and asking questions of the data. Charmaz (2006 p 138) suggested that this is not a strict process, which may differ from Urquhart's (2013) view, and that "theoretical playfulness" can lead to an openness which expands the view of the study context. However, she did suggest that procedure is important and

advised the use of theoretical memos and finding relationships between constructs to aid the abstraction. Further Charmaz (1990) advised creating theoretical constructs which subsume smaller codes thus creating constructs of more significance, which Urquhart et al. supported in 2013, thus allowing a presentation of the data. Urquhart (2010) suggested a method of using integrative diagrams (Chapter 5, Figures 4, 5, 6) to explain the constructs and their relationships which can aid this abstraction to a substantive theory. Thus a stage is reached where the level of interpretation in the amount of conceptualisation in Urquhart et al's. (2013) framework is reached, and a substantive theory for the study can be presented.

Urquhart (2013) suggested that the best way to present a grounded theory is by presenting it through its creation via the stages of coding which is often best shown through the use of tables (Table 14 which demonstrated the themes, factors and sub-factors) through to the creation of diagrams to show the relationships (Figures 4, 5, 6 and 7) and to show the narrative of the data (Figure 8). Further narrative can be presented through the use of quotes from the data (Chapter 5, 5.2). The presentation of the substantive theory can take a variety of forms including a list of propositions or a list of hypotheses (Glaser and Strauss, 1967, Charmaz, 2006) though Urquhart (2013) argued that the easiest way is through the use of a diagram (Chapter 5, section 5.4 Fig 10 p 182).

In a constructivist grounded theory approach the position of the researcher is pivotal to the construction of the theory and it recognises that data and analyses are social constructions that reflect a situation in time, place and culture. It allows for understanding how, when and to what extent the phenomenon is embedded in wider networks and relationships (Charmaz, 2006). This potential for constructivist grounded theory replicated the participants in this study who worked within the wider context of their profession and the NHS allowing for enhanced analysis and greater theorising. As such the researcher must be able to reflect on how the theory evolved, to acknowledge their presuppositions and how these may influence the interpretation. This reflexivity encourages the researcher to consider their own interpretations as well as those of the participants creating a shared

construction of a theory (Neill, 2006). This differs from an objectivist approach where data are considered real and where there is no attention to how the data were produced. In the objective approaches of a grounded theory the influence of the researcher, the social context of the emergent data and the interactions between the researcher and participant are ignored (Charmaz, 2006). It was acknowledged that this situation would be impossible for me to replicate in view of my experience of the phenomenon, my knowledge of the literature, gained in applying for grants and ethics, and, therefore, the development of pre-conceived sensitising views. My positionality (3.4) was, however, suited to using my pre-conceptions and sensitivities in an interpretive way that supported the use of a constructivist grounded theory based on an epistemology of pragmatism and an ontology of social constructionism (Chapter 3; 3.1.3, 3.1.4, 3.2.1, 3.2.3) aiming for a substantive theory following an interpretive approach and taking into account a cultural context.

3.4 Positionality and insider research

It is necessary for a qualitative researcher to identify their position in relation to the research process and therefore this was another consideration in the choice of a grounded theory approach. Maher and Tetreault (1994 p 164) defined positionality as a “specific position in any context as defined by race, gender, class and any other socially significant dimensions”. St Louis and Calabrese-Barton (2002 p 19) developed the work to include factors beyond the immediate individual and defined it as “the relational place or value one has that influences and is influenced by varying contexts (social, political, historical, educational and economic)”. This suggested that an individual is shaped by their unique experiences and that these, often unrecognised, values and assumptions influence what is done by the individual in an uncontrolled manner (BERA, 2010). St Louis and Calabrese-Barton (2002) suggested that reflexivity derived from a researcher’s understanding of their own position is very difficult for novice researchers though Walford (1998) warned against navel-gazing in doctoral students and advises the doctoral researcher to consider their own importance and personal influences within the research process. St Louis and Calabrese-Barton (2002) suggested that

historical, social, political and cultural issues position individuals before they are born though other influences, including education and professional culturalisation, are important factors to be considered in relation to the study.

Grounded theory was pragmatically chosen as a methodology for this study not only because it could address the research question but, also partly, as it appealed to my tendency towards positivist methodologies resulting from my quantitative research background. However, I am a physiotherapist with a history of WSD investigating other physiotherapists with WSD which puts me in a position of collaboration (Charmaz, 2000) rather than a simple observer. St Louis and Calabrese-Barton (2002) identified that this could create issues around being “an insider” and create a particular interpretation of the data. They suggested that areas might be skimmed over or that prompts could be missed as an insider researcher might believe that they fully understand the issue. They also suggested that a researcher might want to be seen as an insider by the participants which may not be possible. Although I am a professional physiotherapist I am an educationalist and, as such, could be seen very differently by my clinical colleague participants which might distort the information revealed and its interpretation. A researcher’s position in relation to the research can influence data collection and analysis though awareness of this is likely to reduce the impact. Positively, Allies (1999) suggested that familiarisation with an area is often the drive for the research area, as in the case of this study, but that the researcher needs to consider how their position influences the process. Taking this into account I felt that ontologically the use of grounded theory was appropriate to address the research question. My personal experience of the phenomenon under study and consideration of symbolic interactionism excluded the use of objectivist grounded theory. Having considered social constructionism I felt it was appropriate to use constructivist grounded theory as I have experience of the phenomenon under study and thus my positionality as an interpretive co-creator of data and analysis in collaboration with the participants, is well positioned to construct a theory. My positionality must be acknowledged within any grounded theory but, in using social constructionism in constructivist grounded theory Charmaz (2006), this positionality can be of

assistance in interpretation. In addition to this potential asset I considered that the use of social constructionism might have been more easily accepted by physiotherapists as it is based on language, which is a fundamental component of physiotherapy practice.

It has already been established that grounded theory was appropriate to answer the research question and as a constructivist approach suited my personal position, in terms of experience, ontology and epistemology, it was therefore chosen for the study.

3.5 Summary for use of constructivist grounded theory

Each approach of grounded theory has its own merits and each needs to be considered in relation to the research question and the researcher.

Objectivist grounded theory retains positivist tendencies and suggests that there is an external world which can be described, analysed and explained. An objectivist approach would have required accuracy and detachment in order to know the truth of what the study participants meant in their interviews. This approach to grounded theory would have been difficult for me in view of my own positionality as a physiotherapist who has experienced the phenomenon under study. Conversely, constructivist grounded theory recognises the researcher's positionality and their active involvement in the data creation with the participant which results in the subsequent analysis being as a consequence of active interpretation (Charmaz, 2006). This interpretive approach would allow me to explore different perceptions and experiences of WSD with the participants which suited my own knowledge regarding the study topic and my pragmatic ontological stance. Therefore a constructivist grounded theory approach with an epistemology of social constructionism and ontological position of pragmatism was adopted for the study.

3.6 Enhancing rigour

Qualitative research has contributed a great deal to understanding the meanings, views and experiences of people within health and social care settings, however the methods used have been criticised in the past for being unscientific and anecdotal (Pope and Mays, 1999, Silverman, 2001, Holloway and Wheeler, 2002). Applying the reliability and validity standards

of quantitative research to interviews and their analysis could, however, be viewed as incompatible with the ontological, epistemological and methodological foundations of qualitative research and the integral role of the researcher in the research process (Dawson, 2009). To guide judgement of the integrity and trustworthiness of qualitative studies Lincoln and Guba (1985) suggested a gold standard of evaluative criteria; namely credibility, transferability, dependability and conformability. Applying high standards of rigour to the processes of data collection and analysis allows the data to go beyond anecdote and represent the reality of the participants (Dawson, 2009).

Credibility, dependability and conformity

Credibility (internal validity) is concerned with determining whether the research is genuine, reliable or authoritative and refers to the researcher's meticulous efforts to establish confidence in the integrity of the data analysis and interpretive findings (Carpenter and Suto, 2008). Transferability (external validity) refers to the extent to which the results from the study can be generalised or applied to other individuals, groups of people or contexts. In this study transferability was enhanced by collecting demographic data and describing the specific context and participants in the methods chapter so that the potential for applying the results to other contexts or participants (Braun and Clarke, 2013) can be considered. The study was conducted within the NHS in UK and therefore there is the opportunity to transfer the findings to other NHS establishments within the UK. Dependability (reliability) concerns how the findings - the emergent theory - fit the data from which they have been described and the possibility of generating the same results when the same measures are administered by different researchers to a different participant group (Braun and Clarke, 2013). In an interpretive qualitative research design the process and knowledge produced is inevitably influenced by the researcher. An audit trail via memos and reflections together with supporting previous evidence support the methodological decisions, and hence the adequacy (trustworthiness) of the research process (Carpenter and Suto, 2008). Dependability was enhanced by documentation of the methodological choices, sampling strategy and

methods of data collection and analysis, and by developing the theory from the data (Denscombe, 2003). Conformability (objectivity) refers to the degree to which findings are determined by the participants and conditions of the interview and not by the way that the researcher phrases questions, their choice of issues to probe or the way they categorise the answers for analysis (Lincoln and Guba, 1985, French et al., 2001). Although a semi-structured schedule of open questions was used in this study (see chapter 4) the ability for the data collection process to be flexible allowed the interview to be shaped and led as much as possible by the participant so that their unique experiences and perspectives were recorded.

Validity and reliability

Verification of the validity and reliability of the research process can be achieved by the researcher's selective and critical use of various strategies for demonstrating rigour such as member checking and triangulation. In this study the reliability of the transcriptions was confirmed by comparison of sections of the audio recordings with the written transcript, and member checking was used to ensure that results were credible and dependable, from the point of view of the participants (Braun and Clarke, 2013) (see methods 4.6). All of the participants agreed that the transcript faithfully represented their interview and no alterations to transcripts were necessary. Triangulation is a powerful strategy for strengthening the credibility of a study and is based on convergence of information from multiple sources to corroborate the data and emerging themes (Carpenter and Suto, 2008). A triangulation of methods can be used (e.g. focus groups or participant observation), data/sources (e.g. different locations) and researchers (e.g. the different perspectives of another researcher) (Carpenter and Suto, 2008). Triangulation with respect to methods was not possible due to the chosen methodology and only interviews were used as a data collection tool. Although true triangulation was not possible with other researchers owing to the Doctoral nature of the study, the emergent themes were presented to members of the All Wales Treatment Handling Group (AWTHG) and All Wales Occupational Physiotherapy Group (AWOPG) and were then discussed within each group. Although the discussions were fulsome they

resulted in no change to the identified emergent themes but acted to verify the analysis. Triangulation with respect to data/sources was attempted by recruiting a variety of physiotherapists in terms of age, gender, length of service and clinical speciality

4 Method

This chapter presents the context for the study, the ethics and governance processes which were undertaken for this study and identifies how consultation with individuals and organisations was managed. Selection of participants and their inclusion and exclusion criteria is presented. The use of interviews as a data collection tool is discussed and the development of the interview schedule described. The iterative development of the interview schedule is explained throughout the data collection process. The choice for the number of interviews to be completed is discussed. The phases of data collection for this study are described including the rationale for the use of pilot interviews and discussion on the recruitment and data analysis at each phase. The focused data analysis is described and the final outcomes of analysis presented. The methods of data management and storage are described. Extracts from a reflective diary, reflective memos and theoretical memos are interspersed to demonstrate reasoning processes that underpinned the methodological choices. Reflection points, based on diary extracts, are inset and written in italics identifying the date of the diary entry. The memos are in tabular form and the date of creation identified.

4.1 Study context

Using constructivist grounded theory (CGT) requires the consideration of the place and culture in which the study took place. This study was undertaken in one NHS Health Board in South Wales, United Kingdom (UK) and as such the evidence needs to be related to this context. Wales is a devolved country within the UK and, although it has no revenue raising powers, it has managed its own health budget since devolution in 1999. The current structure, following reorganisation in 2003, includes seven Local Health Boards (LHBs) two of which are University Health Boards (UHB) where a university teaching role is included, responsible for delivering all NHS healthcare services within a geographical area and three national NHS Trusts which operate nationwide agencies and services. The NHS in Wales follows the same universal banding system for staff as the rest of the UK with entry level physiotherapists starting on Band 5 rising through 6, 7, 8, 8a

and 8b. At Band 7 parallel titles include clinical specialist, who is a physiotherapist who specialises at a high level in a particular clinical field, and extended scope practitioners (ESP), who are those physiotherapists who have taken additional training to work beyond the usual scope of physiotherapy practice. Band 8, although not exclusively, tends to be managerial or strategic positions and Band 8a and Band 8b are almost always strategic in nature (The NHS Staff Council, 2013). The staff within the Health Board were predominantly educated within the UK, each following a programme accredited by the Chartered Society of Physiotherapy potentially allowing transfer of this study's findings to other NHS providers.

The Health Board chosen for this study, although not geographically the largest, services the highest population within Wales and houses several national clinical specialist centres and is closely linked to a Russell Group medical school. The decision to base the study within the NHS arose from the literature, where differing prevalence rates of work-related spinal disorders (WSD) in various clinical specialities had been identified (Molumphy et al., 1985, Bork et al., 1996, Holder et al., 1999, West and Gardner, 2001, Glover et al., 2005, Barnes et al., 2007). Clinical areas demonstrating high risk of WSD were rehabilitation and hospital based activities. Within the UK the NHS is the largest employer of physiotherapists and a number of the clinical areas, including rehabilitation and hospital based activities, are solely, or predominately, provided by the NHS making the NHS the appropriate institution within which to place this study.

4.2 Research Ethics and Governance

Prior to commencement of the study a vigorous series of ethical processes was successfully undertaken. The study underwent the University of Brighton's School of Health Science's two tier research ethics and governance process which is in situ to address ethical and governance issues at an early stage as suggested by Robson (2002). The initial stage was the Research Plan Approval (RPA) panel which was passed in November 2011. The second stage was the Faculty Research Ethics and Governance Committee (FREGC) where the chair and vice-chair of the committee approved the study in May 2012.

Following successful University of Brighton processes the research proposal was submitted for the external ethics approvals required to conduct the study within the NHS, via the Integrated Research Approval System (IRAS). The process for all research being undertaken in the NHS in Wales was via The National Institute of Social Care and Health Research (NISCHR) Permissions Co-ordinating Process (PCP) (WAG, 2011, NISCHR PCP, 2011). The IRAS application was submitted by NISCHR PCP to the South East Wales Research Ethics Committee (REC) for consideration through proportional review, which confirmed that proportional review of this study was appropriate and that the only approval required was that of the University Health Board's (UHB) Research and Development (R&D). IRAS (via NISCHR PCP) had simultaneously submitted the research proposal directly to the UHB and their R&D granted approval in September 2012. An interruption of studies from September 2012 to October 2013 required permission to be suspended and an application to UHB R&D was made for reinstatement, and granted in December 2013.

4.3 Consultation

To comply with requirements of ethical approval relevant individuals and organisations were consulted, both prior to and during the study, to provide an independent and critical review process.

Table 6 outlines the stages of the process when consultation occurred and the purposes of that involvement.

Stage of research process	User involvement	Purpose of involvement
Identifying topics	Physiotherapists AWTHG AWOPG	Ensure appropriateness of research aims
Designing research	AWTHG AWOPG Physiotherapists	Ensure feasibility and appropriateness of methods Development interview schedule
Analysing and interpreting findings	AWTHG AWOPG	Obtain perspectives on data interpretation
Evaluation	AWTHG AWOPG	Obtain perspectives on findings and explore further study topics
Dissemination	CSP	Ensure appropriateness of dissemination for best impact

TABLE 6: CONSULTATION IN THE STUDY

Key:

- CSP, Chartered Society of Physiotherapy
- AWTHG, All Wales Treatment Handling Group which is a group of clinicians interested in treatment handling issues which has developed handling guidelines for physiotherapists in Wales
- AWOPG, All Wales Occupational Health Physiotherapy Group which is a special interest group of the CSP

4.4 Selection of participants

To ensure the emergent theory was grounded in the data, rich data were necessary and Morse (2007) identified that to obtain rich data appropriate participants are necessary. Therefore, purposive sampling was used to recruit participants who had experience and views on the study topic. Sampling aimed to maximise opportunities to discover concepts evolving from the data and therefore was an ongoing process (Bryman, 2008) and changed with the evolution of the research (Morse, 2007).

Following the granting of ethical approval, permission to access the physiotherapy staff in the UHB was gained via the Therapies Directorate Research and Development Lead in the UHB. A wide range of staff grades in diverse clinical settings was available within the UHB and provided a

purposive convenience sample. The next stage of sampling is described by Charmaz (2006) as initial, where criteria for inclusion are established which gives the start point of grounded theory development (see section 4.4.1 for inclusion and exclusion criteria for this study). Theoretical sampling followed, which was emergent rather than pre-planned where participants were selected as directed by the emergent data analysis (Charmaz, 2006). It was not possible at the early stages of the study to identify who they would be and the rationale for theoretical sampling is therefore described at each phase of data collection (see section 4.6.3). Although not imperative it is advisable to have a wide population sample (Noerager Stern, 2007) so sampling aimed to include as many Bands of physiotherapist and diverse clinical settings as possible, whilst responding to the data.

4.4.1 Inclusion and exclusion criteria

The purposive convenience sample for this study was any physiotherapist working within the UHB and from this sample initial and theoretical sampling took place. Appropriate inclusion and exclusion criteria were established and used for recruitment of the initial, and majority of the theoretically sampled (see 4.6.4 for the exceptions), sample.

Inclusion criteria:

- physiotherapists practising within the NHS currently working in the UHB,
- experience of WSD acquired whilst working within the NHS or exacerbated by working as a practicing physiotherapist within the NHS,
- physiotherapists with experience of WSD pain or dysfunction either previously or currently, though not necessarily experiencing pain at time of recruitment or data collection.

Inclusion criteria for theoretically sampled participants was; working within the NHS and employed by the Health Board as per ethical approval, and were dependent upon the emergent codes developed from data analysis of previous participants.

Exclusion criteria:

- physiotherapists with no experience of WSD,

- spinal pain or dysfunction which was not aggravated by physiotherapy practice,
- any co-morbidity which may influence a person's ability to carry out normal physiotherapy practice e.g. chronic fatigue syndrome,
- other health staff who were not physiotherapists.

4.5 Interviews

Nicholls (2009a) identified that interviews are ubiquitous in qualitative research and therefore the main instrument for data collection is often the researcher, and as such the researcher's integrity, sensitivity and commitment to moral action is critical to ensure ethically sound quality data (Kvale and Brinkman, 2009). As the study was interested in human interactions interviews were chosen as they allowed an in-depth exploration of the topic (WSD) with a person/s with relevant experiences (Noerager Stern, 2007), and are considered a useful method for interpretive enquiry (Charmaz, 2006). Interviews were chosen in preference to focus groups, which also had the potential to collect appropriate data, due to the possible sensitive nature of the information which may have made a participant reluctant to disclose in a group situation, whereas individual interviews can encourage open discussion.

4.5.1 Interview style

Although interviewing is harder than may be realised and there is potential for ambiguity in phrasing the questions and interpreting the answers, it is a common and powerful means of trying to understand human beings (Fontana and Frey, 1998). Three types of interview are identified as structured, semi-structured and unstructured the uses of which are dependent on the desired outcome. A structured interview is based on pre-determined issues and follows a pre-prescribed format prepared in advance. Therefore, the interviewee has limited opportunities to respond and is seen as a source of information, which can limit the information gathered. Fontana and Frey (1998) and Nicholls (2009a) identified that the interviewee is passive and does not actively participate in what information is revealed or concealed. This approach therefore, would not be appropriate for the constructivist grounded theory methodology of this study where co-

construction of data is fundamental. Semi-structured interviews are based upon a pre-determined set of broad questions and themes which are less rigidly adhered to than in the structured approach. This allows for movement away from the set themes and, although the interviewer retains a certain degree of control, there is opportunity for the interviewee to add their perspective and a deeper understanding is possible (Nicholls, 2009a). Alvesson (2011) suggested the point of departure for an interview needs to be supported by flexibility to allow development of questions dependent upon emergent themes. A semi-structured interview can aid the interviewer to gain depth of data by allowing the use of a flexible schedule and by repetition of the interviewees own words, and reduces the anxiety of remembering what to ask (Charmaz, 2006, Roulston, 2010). The semi-structure interview style therefore was appropriate, not only for the CGT methodology of this study, but also would benefit the study researcher, identified as a novice research interviewer. Although Flick (2009) identified several types of semi-structured interviews the “expert interview” appeared to be the most appropriate for this study. The expert interview aims to have participants who are expert in the field under study which, for this study, was physiotherapists who had experienced WSD. The unstructured interview allows for greater depth and breadth of exploration than the other styles (Fontana and Frey, 1998) and does not follow a pre-determined interview guide and often develops from an initial prompt – in this case experiences of WSD, though Nicholls (2009a) does caution against wandering too far from it.

Taking into account the amount of previous evidence on the topic of WSD, the researcher’s status as an early researcher and the epistemology of the CGT methodology a semi-structured, expert interview was chosen as appropriate for this study. The use of semi-structured interviews fits CGT well as both are “open-ended but directed, shaped yet emergent, and paced yet flexible approaches” (Charmaz, 2006 p 28).

4.5.2 Interview schedule development

The initial interview schedule (Appendix 2 V 1), was developed for the pilot interviews based on current literature and taking into account the

researcher's sensitising concepts and pre-conceived ideas, based on personal experiences and knowledge. Charmaz (2006 p17) identified that the sensitising concepts are a "place to start not to end". This process created the early ideas for the questions to be included in the interview, consistent with the constructivist view of constructivist grounded theory. To mitigate against over involvement of the researcher's sensitising concepts the initial interview schedule was emailed to members of the All Wales Treatment Handling Group (AWTHG) and the All Wales Occupational Physiotherapists Group (AWOPG) and two physiotherapists (who subsequently were not invited to participate in the study) for their opinion of the schedule (Table 4). No alterations were suggested.

During the interview process developments to the interview schedule were made in recognition of emergent data. Therefore changes were made to the introductory phase of the schedule after the pilot interviews when version 2 was created (see 4.6.1 and Appendix 1 V2) and following interview four when version 3 was created (see 4.6.2 and Appendix 2 V3). The changes were minor but reflected the iterative and constructive process synonymous with CGT.

4.5.3 Number of interviews

How many interviews should be undertaken in a study is an issue within qualitative research about which there is a paucity of explicit discussion. Considering this is a fundamental issue for qualitative research it leaves the researcher uncertain about how many interviews is considered enough. Baker and Edwards (2013) tried to address this, in their methods review paper for the National Centre for Research Methods (NCRM), by garnering the opinion of fourteen experts, including Charmaz, and five early career researchers. As was to be expected the answer upon which all agreed was; that it depends. Further exploration upon what it depends, revealed aspects of epistemology, theoretical perspective, methodology, and other practical considerations including time and resource availability, funding and ethics committees. As all of these are unique to each study it is impossible to answer the question of how many interviews is enough per se. Additionally, several of the experts suggested that the presumed number may change

throughout the duration of the study and this can be dependent upon the quality of the analysis as well as practical aspects like access and availability of participants. Charmaz (2006) agreed and suggested that the analysis is more important than the actual number. Others within the Baker and Edwards (2013) investigation advised that it is more important that the “right person” is interviewed than the number (Baker and Edwards, 2013 p 6). A consensus between most of the experts and the early career researchers was that Doctoral students can often do too many interviews as there is a feeling that more is better. If contributory factors, described by the experts in Baker and Edwards (2013) are considered, more interviews might not be better, but that all factors need consideration when calculating whether enough interviews have been conducted. What was generally accepted by all contributors to the paper (Baker and Edwards, 2013) is that enough need to be conducted to approach the concept of “saturation” although they suggest that this level is difficult to identify. The general understanding of when saturation is reached is when the researcher hears nothing new. In grounded theory it is not just the repetition of the same themes which dictate the identification of saturation as saturation in this context also refers to theoretical saturation (Hood, 2007), a stage when gathering of new data no longer initiates new theoretical insights or categories. Therefore the identification of saturation must run concurrently with, and is dependent upon, data analysis, abstraction and theorising. There is dispute amongst grounded theorists if theoretical saturation is achievable and identifiable as it is reliant upon the ability of the researcher’s analysis. Therefore a novice might suggest saturation has been reached when a more experienced theorists would disagree. Dey (1999) suggested that categories are not saturated by data rather they are suggested by data and adds that instead of claiming theoretical saturation has been achieved the term “theoretical sufficiency” is more appropriate. Charmaz (2006) supported his view and as CGT was used in this study the concept of theoretical sufficiency was adopted. Noerager Stern (2007) advised that ethics committees are uncomfortable with the justifications for interview numbers and prefer a set number to be stated. She suggested she uses experience of what was adequate in previous studies and the number can be corrected later. The

researcher did not have the benefit of previous experience and although the exact number could not be prescribed at the commencement of the study the previously identified factors were taken into account, and there is confidence that the sixteen participants included in the study allowed theoretical sufficiency to be reached.

4.6 Recruitment of participants and data collection

The recruitment and data collection process involved three phases: phase 1 was the pilot study involving two participants, phase 2 involved the initial recruitment and included three participants and phase 3 involved theoretical sampling including eleven theoretically recruited participants in four stages.

4.6.1 Rationale for use of pilot interviews

Although not mandatory in qualitative study due to the iterative nature of the methodology (Braun and Clarke, 2013), conducting pilot interviews addresses several purposes. Their use can be controversial, though if justified can enhance the rigour of the study. Although it is desirable to enter the research ignorant of pre-conceived ideas and knowledge, it has already been established that this was unlikely to occur, and the constructivist approach can adapt to the researcher's role through reflexivity. Reflexivity of the researcher can ameliorate against their pre-conceived ideas and enhance the data quality. In addition to providing data for analysis to enhance the interview schedule development, pilot interviews offered the opportunity to practice the interview process as the interviewer, although experienced in clinical interviews, was less experienced in research interviews, and therefore pilot interviews were considered beneficial to the study for several reasons. In CGT data from a pilot study can be included in the main study (Charmaz, 2006) and as such, the data from the two pilot interviews were incorporated.

4.6.2 Phase 1: Pilot interviews Recruitment

Prior to the main study two physiotherapists, who had experienced WSD, who were aware of the study volunteered to participate for a pilot study and were recruited.

The two pilot participants were given a Participant Information Sheet (PIS) (Appendix 3) and an opportunity to have any questions answered. An interview appointment was arranged, which was scheduled at the convenience of both the interviewer and the participant (Roulston, 2010), and a reminder was sent by email 48 hours prior to the appointment. The two pilot interviews (chosen pseudonyms Sarah and Blodwen) lasted between 38 and 51 minutes, and were conducted in December 2013 in a quiet room within Cardiff University as the use of a room away from the participants' work-place can have beneficial effects: to liberate participants from perceived peer or hierarchical pressure, and encourage them to disclose information which would create rich data and to establish the researcher's role as a researcher and not as a clinician or as an insider (See 3.4).

Data collection

At the appointment it was confirmed that the participant had seen and read the PIS and had any queries answered and was then offered a further opportunity for questioning. It was explained that the interview would be audio recorded and the recording would be transcribed before being deleted. The Informed Consent Form (Appendix 4) was signed and witnessed with additional informed consent being gained to video the interview to be used as a training aid by the researcher. Permission to take field notes during the interview, to be used as an aide memoire, was verbally requested and agreed.

Prior to interview the video camera was set up distant from the interview position to reduce its impact, and both participants later verbally reported forgetting that it was there. Two audio-recording devices were switched on and the interview proceeded using the interview schedule 1 (Appendix 2 V1). At the end of the interview the participant was invited to offer anything else they wished to and then the audio-recording devices were switched off.

The taking of clear field notes from early on in the study provided an important addition to the study as thoughts were captured early and acted upon. Reflective memos were handwritten on loose paper sheets

immediately post-interview which were subsequently adhered to the interview transcript and represented personal observations and thoughts at the time. This acted to record reflections and ideas concerning data collection and immediate ideas on data content and early ideas for coding (Appendix 5).

Data analysis

The video recordings were used by the researcher to analyse performance and develop appropriate research interview skills. Following the interview the participants each watched their video and verbally reported to the researcher on the interview experience. The video recordings were then deleted.

To provide initial familiarisation and interpretation the pilot interviews were manually transcribed by the researcher (Lapadat and Lynsay, 1999). No attempt was made to clean up or edit the data with respect to slang, vernacular terms or abbreviations, and the only changes made to the words spoken related to anonymising the data. Early identification of possible codes enabled reflection on the data gathered and allowed the development of the interview schedule for later interviews (Appendix 2). Consideration of the reliability of the transcriptions was made by comparing sections of the transcription with the audio-recording (Kvale and Brinkman, 2009) and once complete the whole transcript was verified against the audio-recording. The final transcription was sent, electronically, to the participants for confirmation that it was an accurate record of the interview and to identify any parts of the interview they wished not to be used. No alterations were requested.

Coding is the core analysis process in all of the grounded theory approaches where conceptual abstraction of the data and their re-construction as a theory occurs (Holton, 2007). Coding is a way of organising the data into meaningful groups which identify a feature of the data that is interesting to the researcher and is “the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon” (Boyatzis, 1998, p 63). Within CGT data analysis is a continuous process involving coding the data as it is collected and runs concurrently with data collection as the analysis informs the data collection.

The various approaches of grounded theory are subtly different and Charmaz (2006) felt that her approach allows the researcher to shape the emergent codes via interpretation and construction and that multiple realities are possible. This style of analysis, therefore, allows for the possibility of more than one truth and therefore a theory, as opposed to *the* theory will be created from a constructivist grounded theory approach. Charmaz (2006) suggested that it is the coding which is the pivotal link between the data and an emergent theory and this repeated comparison between data collection and emergent theory is referred to as constant comparison and is a significant component of the analysis. Pattern based analysis rests on the presumption that ideas which recur across a dataset capture something psychologically or socially meaningful in relation to the research question, and represent a level of patterned response or meaning (Braun and Clarke, 2006, 2103). A code is made up of a number of sub -codes and, in identifying what counts as a patterned code and what size a code needs to be, is dependent on prevalence in terms of both space within each data item eg. the number of words/sentences in the interview, and prevalence across the entire dataset eg. the number of participants who articulate the same code across a dataset or the number of individual occurrences of the code across the entire dataset. However, the more instances the code occurs within a data item or across the dataset does not accredit that code with more importance. What is more relevant is whether it captures something valuable with respect to the overall research question (Charmaz, 2006). According to Charmaz (2006) coding consists of at least two main phases, initial and focused, each of which abstracts the data. This coding can be achieved by a variety of approaches including word-by-word, line-by-line or incident-by-incident (Charmaz, 2006). The initial analysis undertaken in this study was line-by-line, as it reduced the possibility of becoming so immersed in the world of the participant, as is possible in the case of word-by-word analysis, that the data are not considered critically or analytically. At initial phase the researcher is advised to work quickly, remain open, to create short simple codes, to stay close to the data and to compare data with data (Charmaz, 2006).

Table 7 shows the stages used by the researcher for initial coding of data and are described next.

Phase	Description of the Process
1. Familiarisation with the data	Listening and re-listening to the audio recordings. Reading and re-reading the transcribed data. Memos of initial ideas written
2. Generating initial codes	Coding interesting features of the data across each interview Same as above across the currently available dataset as each interview was completed, looking for relevance of each code (constant comparison)

TABLE 7: INITIAL DATA CODING PROCESS

Familiarisation with the Data:

To achieve immersion in the data the audio-recordings were repeatedly listened to and the transcripts frequently read as each interview became available. Early ideas for coding were made by annotating the transcript and immediate post-interview memos were recorded and attached to the transcript (Appendix 5).

Generating Initial Codes:

A two phase process for initial code generation took place. A line-by-line analysis of the transcript was made and codes for each line identified and recorded on an Excel spreadsheet. As codes relating to previous literature or repetition of codes emerged they were grouped and recorded as initial codes on the spreadsheet, thus creating a coding table for each transcript (Appendix 6). For constant comparison these codes were compared to the annotations previously made on each transcript, the immediate post-interview memo and to the coding table of previous interview transcripts. Data extracts relating to each code was available by comparing the line number of the Excel spreadsheet to the Word document of the transcript.

An integral part of data analysis in CGT is memo writing which aims to allow the researcher to analyse the data and emergent codes at an early stage and throughout the process. Lempert (2007) suggests that memo writing is

the fundamental process of researcher and data interaction which results in a grounded theory. The style of memo can be numerous and will be dependent upon the researcher and the data (Lempert, 2007). Memo writing provides a constant source of analytical and idealistic information about the data, the research process and the wider constructs involved in the study topic, enabling the researcher to increase their abstraction of the categories (Strauss and Corbin, 1998, Charmaz, 2006). Thus memos have the advantage of providing an “audit trail” of the researcher’s thinking during abstraction of the data. Therefore, in addition to the field notes and immediate post-interview memos described above, reflection on the initial data analysis allowed ongoing dialogue with the process and data. These reflections were maintained within a diary, an extract from which, below (reflection 1), shows an example, post-pilot study in December 2013 (the introduction of signposting within the thesis was added later to assist the reader). An example of a reflexive memo, created from extracts of the handwritten diary to provide a coherent process, can be seen in Appendix 7

Reflection 1 Post pilot study

Reflection on the pilot interviews (Appendix 8) helped support the changes made to the interview schedule as a result. The initial interview schedule was very brief mainly addressing the study aims and the topic of WSD and the interview itself needs a clear and succinct introduction. The introductory details at the beginning of the interviews to set the scene need to be re-written (Following analysis it is apparent that it would be beneficial to know more demographic data regarding the participant and so demographic questions need to be added to the new interview scheme (Appendix 1V2). Both participants discussed their home situation with regard to WSD and as that was a code which has not previously been uncovered through the literature it needs to be included in the schedule (Appendix 1V2). Watching the video recordings showed that I added an open question at the end of the interview which invited any further comments. This was not actually on Interview Schedule V1, but as it elicited some interesting data it should be added specifically to Interview Schedule V 2.

In CGT data from the pilot data can be included in the main study (Charmaz, 2006) and, as analysis of the transcripts demonstrated deep data, the pilot interview data were incorporated into the main study.

4.6.3 Phase 2: Initial Recruitment Recruitment

To enable a systematic recruitment process subsequent to the pilot study, it was necessary to gain support and permission from each level of physiotherapy management to access the UHB physiotherapy staff.

Following the agreement of the Therapies Research and Development (R&D) Lead a process of accessing potential participants evolved. A presentation was made to the Clinical Service Leads, which included a study information poster (Appendix 9), and they were asked for permission to paste the poster, for two weeks, on the physiotherapy notice boards across the Health Board sites. After the two week period a meeting was conducted with each Clinical Service Lead to allow for any additional queries to be answered and to give them a Participant Information Sheets (PIS) (Appendix 3). All Clinical Service Leads suggested presenting the project to the staff at individual team meetings, run by Team Leads, to obtain optimum recruitment and, subsequently, the study was presented at eight team meetings. Not all Team Leads would allow access to their staff via a team meeting stating that the staff did not have time to be involved in a research study. It was not appropriate to follow-up these physiotherapy teams and these people were lost to the study.

An explanation of the study purpose and the potential participants' required commitment level were explained to those who attended the team meetings, together with information on confidentiality and anonymity and an opportunity to ask questions. An electronic PIS was made available to the potential participants through the staff computer system which therefore allowed them as much time as they required to digest the information. All staff who attended the team meetings were invited to participate though they were not required to make a decision at the time. It was possible that staff members would prefer their involvement in the study to remain confidential so all staff who attended the team meetings were given a Participation Form (Appendix

10) to complete, at their leisure, and requested to return it via the internal mail system.

Fifty three (53) Participation Forms were returned, of which there were twenty seven (27) identified respondents who met the inclusion/exclusion criteria and who wished to participate. The 27 potential participants were contacted by email confirming that a mutually acceptable date and time for interview would be arranged. A PIS was attached to each email for their individual information. The initial sample was selected by a person, independent of the study, randomly drawing the first three folded Participation Forms out of a container. Mutually agreeable appointments for interview were arranged via email with the three individuals thus selected. All participants agreed to use text messaging for appointment reminders and a reminder text was sent to the participant 48 hours prior to the arranged appointment.

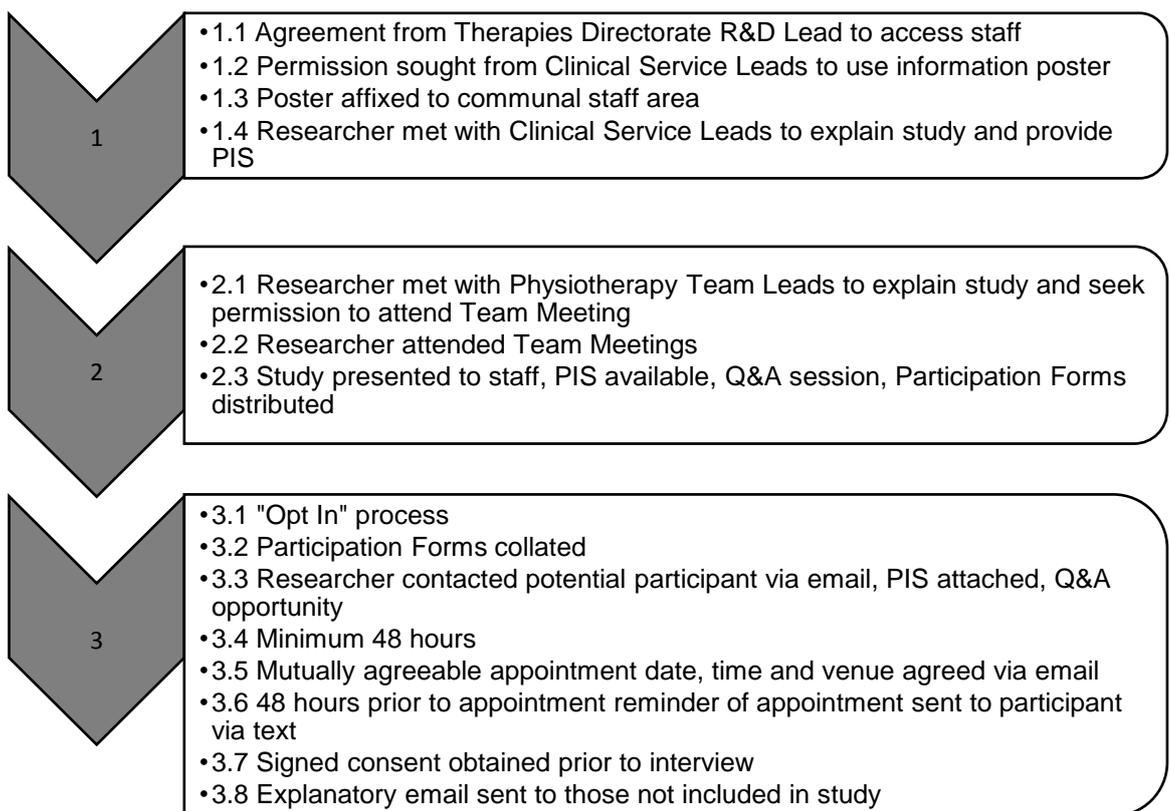


FIGURE 2: SUMMARY OF THE RECRUITMENT PROCESS

These three interviews (Dick, Louise and Tina) took place in February and March 2014 and lasted between 36 and 56 minutes. Dick's interview was

conducted in a room in Cardiff University, Louise's, due to ill health was conducted in her own home and Tina's in a quiet room within her clinical area for her convenience.

Data collection

Similar to the pilot interviews it was confirmed that the participant had seen and read the PIS and had had any queries answered and then offered a further opportunity for questioning. It was explained that the interview would be audio recorded on two audio-recording devices and the recording would be transcribed before being deleted. Informed Consent was given (Appendix 4) and verbal permission to take field notes during the interview, was agreed.

The pilot interviews had identified that a development to the interview schedule would be appropriate in recognition of emergent data reflecting the iterative and constructive process synonymous with CGT. Version 2 of the interview schedule was used for Phase 2 interviews (Appendix 2 V2). The interviews were initiated by asking the participant to choose a pseudonym to ensure anonymity and to reassure that confidentiality would be maintained. The interview proceeded with the opening demographic and work history questions which, in addition to gathering this data, put the participant at ease. Subsequently open questions were used, guided by the semi-structured schedule (Appendix 2 V2) giving the participant the opportunity to give answers in their own words, which were then followed up by the interviewer, often using the participants' words, to probe further so generating rich data (Alvesson, 2011) (Appendix 11). Follow-up questioning along with active listening, supportive gestures and silences meant that the interviewer and participant co-produced the data consistent with a CGT approach. These spontaneous reactions were not able to be included in the interview schedules and in this respect each interview was different from the others whilst still following the semi-structure of the interview schedule. At the end of the interview the participant was invited to offer anything else they wished to and then the audio-recording devices were switched off. The participants were encouraged to make contact should they have anything further to add at a later date.

Data analysis

To continue with initial familiarisation and interpretation of the three interviews they were manually transcribed by the researcher (Lapadat and Lindsay, 1999) allowing early identification of possible codes and reflection on the data gathered. Similar attention to non-editing the data was made and the only changes made related to anonymising the data. Consideration of the reliability of the transcriptions was made similarly to pilot interviews and the final transcription was sent, electronically, to the participants for confirmation of accuracy. No alterations were requested.

The early analysis of the three interviews in phase 2, which took place concurrently with the data collection, followed the line-by-line and initial coding process described in Phase 1 data analysis. As more data was collected the analysis was able to develop a further step to secondary coding by the identification of the initial codes across the whole of the currently available dataset as each interview was completed, looking for relevance of each code (constant comparison). The codes which were identified across the whole data set were recorded manually on a separate chart which expanded and developed as secondary codes as more data became available (Appendix 12). The findings helped inform the content of subsequent interviews and the direction for recruitment of theoretically sampled participants. The secondary codes were re-named factors in line with the study title and objectives.

Similar to the pilot interviews the taking of clear field notes provided an opportunity to capture early thoughts. Handwritten memos were written immediately post-interview, stored with an individual's consent form and then attached to the transcript once completed. After each interview memos were made in a logbook of points raised or ideas for development of the interview schedule for subsequent interviews, early key points which would develop into codes/factors were identified and early comparison made with other interviews. The handwritten notes were developed into tabular form expressing reflexive and theoretical components, and examples for participant Tina are presented below (Tables 8 and 9).

Memo March 2014 - Tina
<p>Thoughts immediately post interview (Tina):</p> <p>Very ready thoughts about the topic.</p> <p>Personal characteristics – see Dick.</p> <p>Increased admin, bariatric pts increasing in number.</p> <p>Early mention of effect of having children. Pregnancy.</p> <p>Access to occupational health</p> <p>More difficult to think of things to reduce risk - like Dick</p> <p>Common words from field notes:</p> <p>Therapeutic handling, treatment, increased admin, occupational health</p>
<p>Influence on data collection:</p> <p>This is band 6 but 16 years' experience so low band but high experience.</p> <p>Theoretical sampling – interview band 5s.</p>
<p>Reflexive memo following initial data analysis:</p> <p>When re-reading transcript for the line by line analysis it is obvious that I use the term “we” during questioning. This associates me with the interviewee as a physiotherapist which supports the CGT premise of construction of data. Need to be aware though not to impose my own views by insinuating them in the questions</p>

TABLE 8: EXAMPLE OF POST-INTERVIEW REFLEXIVE MEMO

Theoretical memo during analysis April 2014

Themes and links developing at initial recruitment:

Effect of home life and children see Sarah fatigue, Louise exs and fitness, Tina family

Individuals' characteristics may influence their work allocation and perceived risk – see Dick, Tina

Supportive team work – see Blodwen, Tina

Guilt about passing work to others – see Blodwen, Tina, Sarah

Personal characteristic see Dick, Tina

Personal fitness – Sarah, Blodwen, Louise, Dick

Admin increase – Louise, Dick, Tina

Poor ergonomic design – Dick, Tina

Financial - Dick, Tina

No give in system Tina, Dick's no slack

TABLE 9: THEORETICAL MEMO FOLLOWING INITIAL RECRUITMENT

Time was taken following the initial recruitment to reflect upon the recruitment process, an extract of which is presented below:

Reflection 2 Reflections on recruitment July 2014

The two pilot interviewees were Band 7 and were followed by two further Band 7s, whose role was extended scope (ESP), and a Band 6 who had been in that banding for more than 10 years. On reflection, as the evidence suggests that it is the early career physiotherapists (entry level Band 5) who are most likely to be injured, it is imperative that physiotherapists from this banding are interviewed. Therefore Band 5s need to be theoretically recruited.

4.6.4 Phase 3: theoretical recruitment

Recruitment and data collection

Recruitment of theoretically sampled participants was based on data analysis and reflection and involved four stages.

Stage 1:

It had been identified that it was necessary to interview Band 5 physiotherapists, and those in this banding were identified from the Participation Form (Appendix 10). Four Band 5 physiotherapists were recruited via the same process as 3.1 to 3.7 in figure (Figure 2) and the interview process was conducted similarly to phase 2.

These four interviews took place between December 2014 and April 2015 and lasted between 25 and 37 minutes. Interviews were conducted in quiet rooms at a convenient location for each participant.

Subsequent reflection identified issues for further theoretical recruitment (Reflection 3 below)

Reflection 3 Reflection on recruitment May 2015

Reflection on the four Band 5s interviews suggested that their limited clinical experience and time exposure restricted their views on the study topic and reduced their contribution. Note length of interview in comparison to those in Phase 1 and 2. Therefore, to deepen the data, Band 6s and 7s who had longer clinical experience, and whom it is anticipated had more views on the subject, need to be theoretically targeted

Stage 2:

During this stage of theoretical recruitment one Band 6 and one Band 7 were recruited using the Participation Form (Appendix 10) and the same process as 3.1 to 3.7 in figure 2 was followed. A further Band 7 was specifically targeted in the Participation Form due to her role in Occupational Health which had been identified from analysis of previous data. The interview process was conducted similarly to Phase 3 stage 1. Interview schedule version 3 (Appendix 2 V3) was used for these interviews, where a specific question on the use of risk assessment had been added in response to analysis of previous interviews. These three interviews, conducted in a room in Cardiff University, took place between May 2015 and July 2015 and lasted between 37 and 52 minutes.

Reflection following this stage of theoretical recruitment identified issues for further theoretical recruitment (Reflection 4 below):

Reflection 4 Reflection on theoretical sampling July 2015

The Band 6 and 7s interviews were noticeably longer than those of Band 5 and identified some similar issues but also generated other data which was not mentioned at Band 5 level. Therefore strategic/managerial level of physiotherapist needs to be included in the study.

Stage 3:

No appropriate individuals at strategic level (Band 8) were identified from the Participation Forms and therefore two individuals of the required band were directly approached by the researcher face-to-face; both agreed to participate. As no appropriate individuals were identifiable from the Participation Forms, and they were subsequently recruited independently from the original purposive sampling cohort, it was not possible to insist that they complied with all the inclusion and exclusion criteria for the study. They did, however, meet the inclusion criteria of being physiotherapists working within the Health Board, though only one met the criteria of having experienced WSD. They did meet the requirements of the theoretical sampling for the development of the data for this study. In response to the open question at the end of the interview each of these individuals later sent additional pertinent documents to the researcher.

These two interviews, conducted in the individuals' work place, took place in July 2015 and lasted between 39 and 47 minutes.

Stage 4:

At this stage the study sample included two (2) pilot participants, a randomly selected initial sample of three (3) participants and theoretical sampling included nine (9) participants. The number of interviews that were required to enable a robust study were considered and the reflection made on this topic, prior to the data collection process, was re-considered (Reflection 5)

Reflection 5 Reflections on number of interviews January 2014

The number required to ensure a robust study is dependent upon a variety of factors some which can be influenced by me and others over which I have no control. The main aim is to interview “enough” to be certain of “sufficiency”. Also need to keep in mind that although sample doesn’t have to be representative I would like to try and interview people from as wide a selection of clinical areas as possible.

Memos recorded following previous interviews were also consulted and an extract from a memo written post initial data analysis in July 2015 (Table 10), supports the concept of moving towards sufficiency and the need for further recruitment.

Reflexive memo – Clare post-analysis - July 2015
Repetition of previous themes – not so much new from this interview except availability and deployment of assistants, and space ? moving towards sufficiency after 9 interviews

TABLE 10: EXTRACT FROM MEMO POST INITIAL DATA ANALYSIS OF INTERVIEW 9 - CLARE

Subsequently two further participants were randomly recruited from the Participation Forms and the usual process was followed. These two interviews (Dave, Brooke) took place in August 2015 and lasted 44 and 33 respectively and were conducted in the individuals’ work place for convenience.

Due to the needs of theoretical sampling, which developed from data analysis of ongoing interviews, not all original respondents were subsequently appropriate to the study. As it could be considered unethical not to include all recruits to a study each person who was not included in the study was sent an email of explanation and thanking them for considering participation.

Following the recruitment process reflection on it is demonstrated below (Reflection 6).

Reflection 6 Reflection on sampling, August 2015

This process recruited a widespread range of participants which did not reflect the professional structure within the NHS Trust as there was a weighting towards the higher banded staff – Band 5 n = 4, Band 6 n= 4, Band 7 n = 6, Band 8a n = 2. As the theoretical sampling was based on analysis and because individuals with longer exposure to this study's topic could provide deep data I feel that the recruitment process was successful and created a sample which was appropriate to the aims of the study. Analysis throughout the process allows for a degree of confidence in data sufficiency.

Data analysis

The transcription of interviews six to sixteen (those theoretically sampled) was contracted out to a professional transcriber who was instructed to follow the same notation system as in Appendix 13 Table 1. To increase clarity additional notation systems were suggested either by the researcher (PC), or by the transcriber (HW) (Appendix 13 Table 2). To maintain the reliability of the transcriptions the researcher compared the professional transcriptions with the original audio-recordings. Only minimal changes were required which usually referred to medical/physiotherapy terminology or abbreviation. In all cases the required correction was obvious.

The early analysis of the interviews in phase 3 followed the line-by-line and the initial coding and the secondary coding processes described in Phase 2 data analysis and took place concurrently with the data collection. As more data were collected in stages 1 to 4 the analysis was able to develop beyond the identification of the initial codes and secondary factors across the whole of the currently available data set and a further level was added to the process (Table 11) – searching codes/factors and sub-codes/factors.

Phase	Description of the Process
Familiarisation with the data	Listening and re-listening to the audio recordings. Reading and re-reading the transcribed data. Memos of initial ideas written
Generating initial codes	Coding interesting features of the data across each interview Same as above across the currently available dataset as each interview was completed, looking for relevance of each code (constant comparison)
Searching codes and sub-codes	Gathering all data relevant to each potential code and collating sub-codes within each potential code. Name changed to factor

TABLE 11: INITIAL CODING PROCESS

Searching for codes involved reviewing the codes, and data extracts, manually recorded on the sheet and the Excel spreadsheet respectively, to identify similarity and overlap between the codes – e.g. concepts, topics or issues that several codes relate to and which could be used as a central organising concept – factors and over-arching themes. The codes were sorted and combined to form factors and sub-codes. Sub-codes were developed as they contributed towards or were components of the factor. This was created manually where the secondary factors on the chart (Appendix 14) were transferred to post-it notes which were then stuck to a larger chart in loosely similar groups dependent upon code content.

4.7 Focused data analysis

Following the initial analysis of all interview data, the focused phase of coding was implemented, involving synthesis of the initial codes giving another stage of abstraction of the data. Focused coding gave the opportunity to check any pre-conceived ideas in the initial codes.

Stages 1 and 2 in table Table12 below shows the stages used for focused analysis of data which are described below. The two stages ran concurrently each informing the analysis of the other.

Phase	Description of the Process
1. Defining and naming factors	Ongoing analysis to refine the specifics of each factor, and the overall analysis. Development of models of theory
2. Reviewing factors	Looking for relevance of each factor (constant comparison) Checking if the factors work in relation to the coded extract and the entire dataset Creation of over-arching themes
3. Producing the thesis	The final opportunity for analysis and interpretation of the data. Selection of extract examples, relating back the analysis to the research question and literature. Develop a theory. Producing a thesis enabling the reader to understand the theory

TABLE 12: PHASES OF FOCUSED ANALYSIS

Defining and Naming Codes

The post-it notes adhered to the large charts were moved and grouped repeatedly until defined themes, factors and sub-codes were identifiable. This process was fluid and several incarnations were considered before the final analysis was accepted (Appendix 14). This analysis allowed theoretical coding in which the codes/factors were compared, synthesised and conceptualised, from which a theory could emerge suggested by the data analysis (Charmaz, 2006, Holton, 2007).

Reviewing Themes:

Further reviewing and refining of the codes to ensure that data within each factor cohered together meaningfully, whilst the distinctions between factors were identifiable to create distinct factors was conducted across the whole dataset. This stage involved consideration of the validity of individual refined factors in relation to the entire dataset and whether the factors accurately reflected the meanings evident in the dataset as a whole. Data extracts supporting each factor were visited to ensure a coherent pattern and then factors were further refined and combined accordingly to create the over-arching themes. Re-reading of the entire dataset allowed for identification of any additional supporting data extracts, which were missed in earlier phases. Conceptualisation models of the emergent theory were developed and similarly evolved through several incarnations.

This process and the emergent themes and factors was presented to the All Wales Occupational Physiotherapy Group (AWOPG) and the All Wales Treatment Handling Group (AWTHG) for an independent assessment of the process and findings. Neither group suggested modification.

Producing the thesis:

The data extracts supporting each code were organised into a coherent and internally consistent account.

4.7.1 Outcome of analysis

Although the line-by-line coding is not presented in detail owing to its volume Table 13 (see page 126) shows the number and type of codes created. The line-by-line code total excludes: yes/no answers, introduction comments and repeated lines, and the ratio of the number of initial codes refers to the number of codes for contributory factors to WSD in relation to the number of initial codes which refer to risk reduction. These ratios are not exact but represent a near approximation of the numbers. Appendix 6 shows an example of an excel spreadsheet used at this stage of analysis and its corresponding interview transcript identifying the data from where the codes were evolved.

The number of line-by-line codes ranged from 107 to 425 though the number of line-by-line codes did not necessarily relate to the duration of the interview. This type of discrepancy may be reflected in the amount of input the interviewer contributed to the interview. The initial codes created from the line-by-line codes ranged from 28 to 105 and again there was no relationship between the number of line-by-line codes and the number of initial codes which were created. It was clear that there were less codes generated regarding issues of risk reduction and the ratios of contributory factors to risk reduction was universally on the higher side. The duration of the interviews ranged from 27 minutes 34 seconds to 56 minutes 51 seconds. Although the duration of the interview was no indication of the number of line-by-line and initial codes created all four of the Band 5 physiotherapists were within the six shortest interviews of the study suggesting they were amongst those who had the least to say.

The secondary factors were diverse and demonstrated the factors involved in contributing to WSD and to its' risk reduction. There were links between these factors which are shown on a chart (Appendix 12) which also demonstrates the direction of evolving factors and the early thoughts of their interconnections.

Theoretical sampling phase	Participant	Interview Duration Mins' Secs"	Number of line by line codes	Number of Initial codes	Number of new initial codes per interview	Initial Codes Ratio Causes:Risk reduction
Phase 1 Pilot interviews						
	Sarah	38'40"	172	90	90	5:4
	Blodwen	51'51"	274	105	42	3:2
Phase 2 Initial recruitment						
Random selection from sample	Dick	56'51"	174	94	33	7:2
	Louise	36'03"	165	87	11	7:2
	Tina	51'10"	238	103	14	3:2
Phase 3 Theoretical recruitment						
Stage 1 Band 5s	Dianne	37'27"	180	100	14	4:1
	Jessica	27'37"	107	45	10	4:1
	Stephen	34' 55"	250	66	6	3:1
	Margaret	28' 25"	163	61	7	2:1
Stage 2 Bands 6 & 7 + occupational health	Lucy	52' 31"	305	67	12	Unable to calculate due to interview style
	Clare	37' 45"	146	60	3	2.5 :1
	Mary	49' 02"	269	53	1	2:1
Stage 3 Band 8/strategic management	Peter	39' 41'	212	51	12	Unable to calculate due to interview style
	Katie	47' 20"	425	63	5	Unable to calculate due to interview style
To ensure sufficiency Random selection from sample	Dave	44' 43"	330	48	0	4:1
	Brooke	33' 34"	292	28	1	2:1

TABLE 13: LINE BY LINE AND INITIAL CODES

4.8 Final Themes

Three final themes evolved from the focused analysis within which eight key factors were identified with a total of twenty five sub-codes. Although individually defined in Table 14, in which the themes, factors and their sub-factors are presented, there was, inevitably overlap and links between them.

Theme	Factors	Sub-factors
The Institution	Management/Organisation	<ul style="list-style-type: none"> • NHS ethos • Management styles
	Service provision	<ul style="list-style-type: none"> • Accommodating changes in delivery • Patients • Environment
The Job	Physiotherapy practice	<ul style="list-style-type: none"> • Caring culture • Work practices • Fatigue • Increased administration • Caseload management and practice modification
	Team effect	<ul style="list-style-type: none"> • Team dynamic • Mentoring • Negative impact
	Handling	<ul style="list-style-type: none"> • Manual handling and therapeutic handling • Manual handling training
	Risk assessment	<ul style="list-style-type: none"> • Value • Use
The Individual	Physiotherapists' career timeline	<ul style="list-style-type: none"> • Youth • Through the ages • Older age
	Personal responsibility	<ul style="list-style-type: none"> • Personal fitness • Knowledge and personal care • Accessing support • Lifestyle

TABLE 14: FINAL THEMES, FACTORS AND SUB-FACTORS

Reflection 7 Reflection on initial data analysis, December 2014:

I have to acknowledge that the initial coding of the first few interviews was shaped, to some extent, by my own experience of WSD and its impact. On re-reading the dataset I need to be more open-minded and appreciate that participants had different experiences of WSD and that their views about causes and prevention might be influenced by factors that I had not experienced. This reflection allows me to understand the value of the ongoing nature, and constant comparison, of data analysis.

Reflection 8 Reflection on focused data analysis, July 2016:

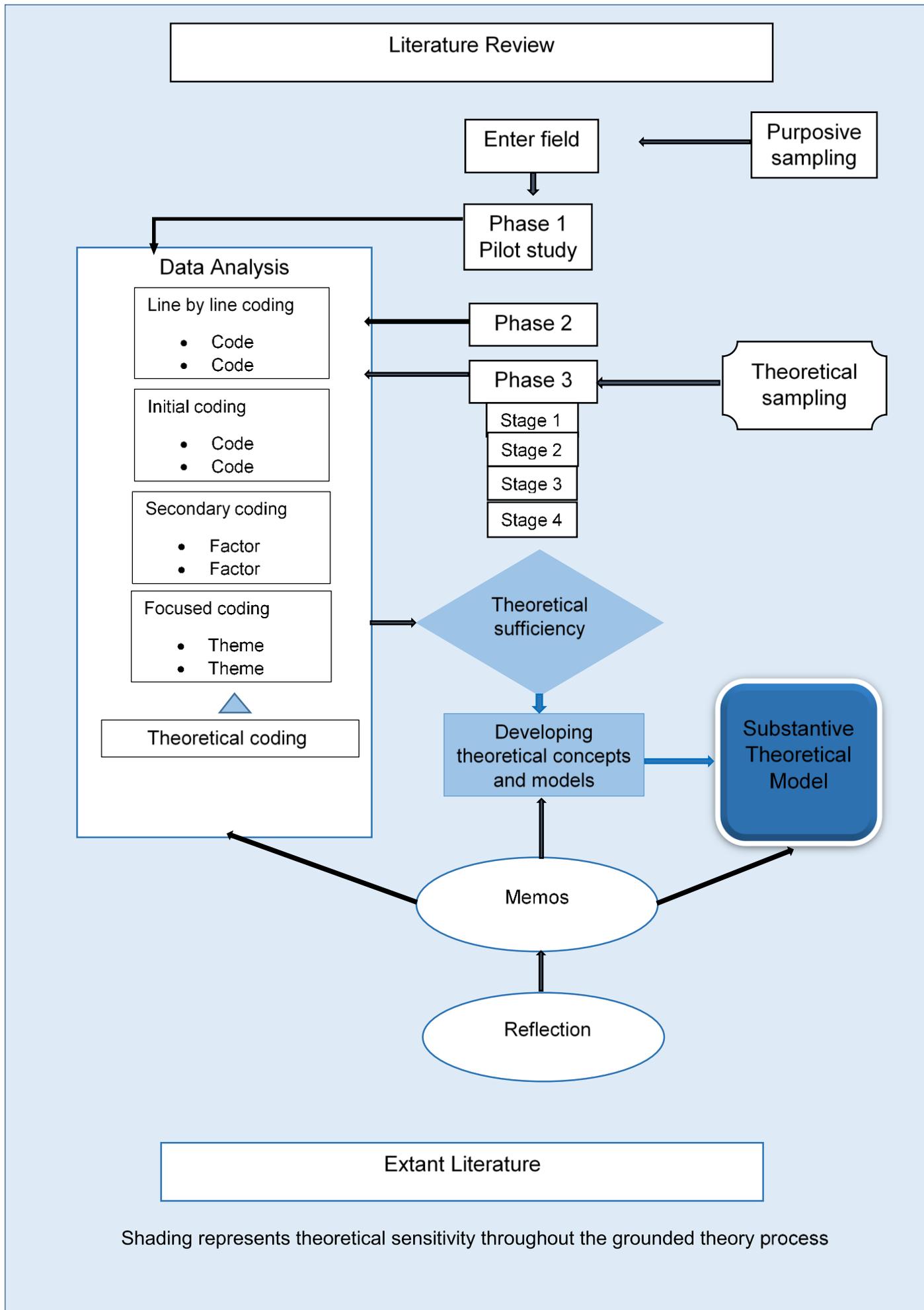
The focused data analysis where themes with supporting codes and sub-codes were created was very fluid and exciting. The arrangement of the post-it notes into loosely similar clusters was in the first instances reactive to the immediate data and felt like the initial coding of the transcripts in the early stages. I worked fast and stayed close to the data (at this stage the data was the information on the post it notes which were essentially the codes and sub-codes) as in the initial coding as prescribed by Charmaz (2006) for the initial coding and although it isn't necessarily advised for focused coding it felt right for this stage of focused coding. It was really exciting and felt very creative. The revisiting and revising of the clusters happened more slowly and it felt like I could have created a variety of differently named clusters as the sub-codes eg. the post-it notes' information, overlapped and could have been moved between different clusters equally successfully. The clusters did evolve from the data and were supported by not only the previous evidence but also my own pre-conceived sensitising views I carried with me from before the study. This was a creative process which took a long time and I became immersed in the data once again though by now it was far removed from the original transcripts. Ultimately the final themes arrived at were not dissimilar to the original loose clusters but were more coherent and based on other evidence and on my influence on the data analysis. Sometimes simply changing the name of a theme eg, from Manual handling to simply Handling, made the theme more

focused. This I think is what is meant by constructivist! I found creation of the conceptualisation of the theory difficult to ensure that it was a true representation of the data. I hope the final model shows the meaning to others.

4.9 The Grounded Theory Framework

Figure 3 diagrammatically represents the grounded theory framework within which this study operated to ensure theory rigour.

FIGURE 3: GROUNDED THEORY FRAMEWORK



4.9 Data management and storage

Three copies of the recorded interviews were made; onto a password protected network, the H-drive on a password protected computer and an external hard-drive which were both stored in a locked filing-cabinet. The files were labelled using the participants' pseudonym and allocated an identification number, eg. 2.1 identified the second participant's interview.

5 Findings and Analysis

This chapter presents the findings from the data analysis the initial codes and secondary factors and sub-factors of which were presented in 4.6, 4.7 and 4.8 in the Methods chapter. The demographic profile of participants is presented in tabular form. The focused analysis presents the themes in table form and then each theme is presented individually with evidence of the factors, using supporting quotes from the interview transcripts. The sequencing of the themes is presented from an institutional to an individual's perspective though no weighting is awarded to this sequence, which is used solely for ordered presentation purposes. Brief analysis of the findings is presented throughout and as a summary at the end of each theme and further discussion of the findings is offered in the following chapter. A theoretical model is developed throughout the findings and presented in full at the end of the chapter.

5.1 Demographic Profiles

The demographic information for the study participants is presented in table 15. To ensure anonymity it was not possible to accredit all details of the demographics to the chosen pseudonym and therefore information regarding age and qualification has been retained from the table.

Participant (pseudonym)	Gender	Years qualified	NHS Band	Clinical area at time of study
Sarah	Female	36	7	Obstetrics and pelvis
Blodwen	Female	30	7	Medical rehabilitation
Dick	Male	17	7 clinical specialist	Musculoskeletal/ rheumatology
Louise	Female	17	7 clinical specialist	Musculoskeletal/spinal
Tina	Female	16	6	Spinal rehabilitation
Dianne	Female	4	5	Stroke rehabilitation
Jessica	Female	3	5	Adult community
Stephen	Male	4	5	Adult community
Margaret	Female	3	5	Trauma orthopaedics
Lucy	Female	13	7 extended scope practitioner	Occupational health
Clare	Female	9	6	Neurological surgery
Mary	Female	17	7	Orthopaedics
Peter	Male	36	8b	Management – out-patients
Katie	Female	27	8a	Management – in-patients
Dave	Male	5	6	Musculoskeletal out-patients
Brooke	Female	17	6	Musculoskeletal out-patients

TABLE 15: PARTICIPANT DEMOGRAPHIC INFORMATION

The sample consisted of twelve female and four male participants who ranged in age from 24 years to 57 years with the oldest being at least 9 years from the current national retirement age. The date of qualification as a physiotherapist ranged from 1978 to 2012 with their length of service ranging between 36 and 3 years. Two of the sixteen had pursued previous careers, one in nursing and one in the military, one had done a previous degree, one had worked in an office and one had briefly pursued a professional rugby career whilst the other eleven participants commenced physiotherapy education directly from school. Despite the pre-entry activity only two of the participants commenced physiotherapy education as mature students, Dick and Stephen, who were both over the age of 21 years.

The participants represented the full range of physiotherapy bands from entry level Band 5 to strategic management Band 8b. There was an apparent relationship between the age of the participant and the band level they had reached. However, Tina remained a Band 6 after 16 years of experience, which was attributed to her desire to remain within the clinical

speciality in which she worked and her wish not to pursue promotion outside of this speciality. Clare and Brooke also demonstrated long experience, 9 and 17 years respectively, and also remained Band 6. Both identified that part-time work was necessary to manage childcare and that this was more available at Band 6 than at Band 7.

5.2 Final themes and factors

Table 14 in the Methods chapter identified the three themes and their key factors and sub-factors which evolved through the data analysis representing the contributory and risk reduction factors for WSD. The themes are presented using supporting evidence from the transcripts for the key factors.

5.2.1 Theme 1 - The Institution

This theme was created from two factors – The first factor was Management/Organisation and the second was Service Provision.

5.2.1.1 Management/Organisation

This factor developed from two sub-codes which were NHS Ethos and Management Styles.

NHS ethos

The perceived change in the ethos of the NHS was identified by several participants to be mostly detrimental and contributing to WSD. Comments related either to historical changes or were in relation to changes in service delivery:

One interviewee referred to a period in the mid-1980s -

I think we entered a sea change in outlook in that it became more each man for himself..... I think also we entered a culture more of a blame culture, compensation culture (Sarah lines 220 - 223).

Whereas another participant identified change since he had commenced working in the NHS -

It's a far less friendly environment than it used to be when I first qualified, a long time ago, it's a much umm / life is busier isn't it (Peter lines 397 - 398).

Participants discussed the impact of the current situation in the NHS on the pressure that they felt and the impact that this had on how they altered their practice potentially putting themselves at greater risk of WSD -

However, particularly in the current economic climate there are huge pressures on people to complete work whether it be within time frames and targets (Dick lines 62 - 63).

But also, I know in OP [out patients] we have the target of trying to see people 4 – 6 times maximum whereas you didn't use to have that sort of time pressure And if you think somethings going to be the most effective treatment, even if it's more strenuous, if you wanted to take things a bit slower, then you do the strenuous and that's a pressure of the environment, in OP anyway (Louise lines 245 - 252).

....the health care professionals, you've got accountability and justifying and proving you're worth and how many treatments and is that patient better.... That's a pressure (Peter 403 - 406).

These comments recognise that over decades within the NHS there has been an increasingly pressurised environment in relation to the NHS's expectations of the work/patient throughput with increasing need to meet imposed targets and accountability. This, in conjunction with an increasingly litigious culture, increases demands on physiotherapists which can increase their risk of WSD by causing treatment modification to meet the demands.

It was also identified that the current and future NHS ethos and direction has a negative effect on physiotherapists by increasing their workload -

We're [NHS] trying to keep people out of hospital, unless they need / you don't come in and now nearly every patient on the ward needs physio (Katie lines 429 – 435).

Yes, I think they / I think it's just going to intensify things, it's just going to grow. The number of people coming in to the NHS, it's just growing (Peter lines 431 - 432).

Although these comments appear contradictory they identify that patient numbers remain high and it is the nature of the patient which has changed as a result of policies. This is also represented as a factor regarding service provision (5.2.1.2) where it was identified that different types of patients, currently being treated within the NHS, can negatively impact on physiotherapists' risks of WSD by increasing workload, and recognises that the themes and factors are closely interlinked.

The NHS' move to keep patients in the community rather than admitting them to hospital, was recognised as potentially having a subsequent negative impact on work practice in physiotherapy -

If you [physiotherapy service] go to a GP practice, you can't guarantee they've got the right equipment there for you (Peter lines 156 - 157).

A continuance of negative impacts on physiotherapists' health was also recognised with the drive to implement a seven day NHS -

We did it as a pilot. We said it would be unsustainable because of health reasons (Katie lines 199 – 200).

The literature review identified that NHS staff health and well-being has not been a high priority until relatively recently but the perceptions of Peter and Kate suggest that changes in NHS ethos for patient care delivery, whilst potentially beneficial for some circumstances have not been adequately considered in relation to staff health and well-being. Consequential, in respect of the issues identified the participants recognised the concept of "patient's unmet needs" (patients who require physiotherapy who do not receive physiotherapy) and that this was an acceptable practice. This relatively recent phenomenon has not previously been incorporated into physiotherapy research though its negative impact on risks of WSD was recognised by participants who were in both clinical and managerial roles -

The demand is greater than they can do, every single day, there is never a day you come to work. We have, at the moment, we're just under 30% of our demand is unmet I think people get stressed (Katie lines 149 - 155).

However, recognition of the unmet need could also be used as a method of protecting physiotherapists as, by acknowledging the need, it can be used to recognise under-resourcing -

I'm happy to have an unmet need because I know that if I'm treating the patients there to what I would call a quality treatment, I don't do enough of them, then that means that we are under-resourced (Mary lines 184 - 186).

Management styles

Participants' perceptions indicated that styles of management, staff levels and practical issues had an impact either positively to reduce risk, or negatively to contribute to WSD.

Band 5 physiotherapists, those most susceptible to WSD, appreciate the support given by a more senior member of staff in reducing the risks -

There was always someone more senior about and constantly willing to help and advise you on positioning and sometimes it is finding what you prefer I think (Jessica lines 159 - 160).

When I have had a direct contact with a senior if you are in a bit of an awkward position, you will get that feedback (Stephen lines 107 - 110).

Though the participants also acknowledged that this support, for a variety of reasons, was not always available which, although not necessarily detrimental could potentially affect the opportunity to reduce the risks of WSD -

.....because I know that I've worked on a couple of wards where you don't always have that direct senior support (Stephen line 99).

Umm ... I think it depends a little bit on the personality of the senior person (Stephen line 228).

The value of managerial support at a higher level is also appreciated in aiding risk reduction -

I think there's then having the organisational support in terms of being a role that you feel supported in, you've got manager support, there's an open communication line with your manager to talk about any concerns or to talk about you know umm manual handling risks or you know whatever and to feel like you're in control of that (Lucy lines 464 - 468).

You know they feel looked after themselves. Umm and I think, you know, subtle things like that, umm, can help (Peter lines 457 - 458).

These participants' comments suggest that the style of management, at all levels, could be either supportive in reducing risks of WSD or detrimental to

safe practice depending upon how it is practised. This impacts at a local level within a NHS LHB, within a physiotherapy department down to individual physiotherapists' level. This could conceivably be extended to the management style of the NHS as an institution, which has already been alluded to where targets, time scales and working practices are imposed upon physiotherapists reducing their autonomy and the potential for safe practice.

Both of the Band 8 managers interviewed acknowledged that they use data of staff wellbeing and sickness absence as leverage for change aimed at reducing risk -

If it seems like a good idea [requests for equipment aimed at reducing risk], it's not enough, it has to be justifiedThe justification is staff need it to maintain their well-being (Peter lines 115 - 118).

A similar type of argument was used when negotiating increased service level provision -

..... was just ridiculous because health was going to / they were at risk of not resting properly and the consequences of that, so we will use health as a big issue. we would certainly be using that if it did start to pick up (Katie lines 205 - 209).

Lack of staff was perceived to be a contributor to WSD, and is discussed below, and it could be perceived that using staff health and well-being as a lever for increased staffing levels is an inefficient and inappropriate method of management. In view of the financial restrictions imposed upon the NHS this can however be an effective method where competition for funding is high.

Although management practices highlighted above could be considered negatively in relation to WSD examples of more proactive management strategies were offered. A system aimed at promoting identification of risky situations was perceived to reduce the decision making responsibility on each individual physiotherapist -

So we have / and we have very clear prioritisation tools you have a prioritisation tool that makes it very clear who you see, so you don't have to make the decision personally (Katie lines 178 - 179).

This explains a method of identifying which patients will and will not be seen in a situation of limited physiotherapists' time thereby identifying "unmet need". It was suggested by participants that these types of tools allow individuals to make reasoned decisions and supporting them to work safely, though there is no evidence of their actual impact.

In addition to its being used as a management leverage tool as indicated above, low staffing levels was frequently identified as being a major contributory factor to WSD by all bands of physiotherapist -

And then with staff shortages on top of that you soon find that your pool of people where you can rotate certain tasks around gets smaller and smaller and suddenly everybody's feeling the strain (Tina lines 142 - 144).

In fact I think that when I had my back injury one of the reasons I didn't go off for any length of time to start with was because we were losing staff (Blodwen lines 111 - 112).

This sub-factor was considered to be highly relevant to contributing to WSD and has previously been associated with acceptance of the concept of an unmet need and the consequences that that concept has on altering physiotherapy practice and the pressure it imposes on physiotherapists. It is recognised within the NHS that physiotherapy can increase patient throughput in in-patient services and assist in keeping patients in their own homes and community settings. Increasing turn-over of patients and patient complexity, discussed below, and targets discussed previously suggest that the NHS would benefit from increased numbers of physiotherapists rather than having staff shortages as identified.

Practical issues were identified by the participants which were considered could be either contributory to, or reduce the risks of, WSD.

Issues around equipment including its lack of availability, maintenance and design for bariatric use (a person with a Body Mass Index (BMI) over 40 (NHS, 2016)) were identified by several -

.....so if you know there's a piece of equipment on a ward nearby, you may end up having to go next door and potentially ask if you can borrow it (Stephen lines 276 - 278).

If it had slid nicely and the piece of equipment had been well maintained the likelihood is she probably wouldn't have hurt herself (Mary lines 48 - 49).

So you know there's still a big need for equipment to be developed in this sort of thing [bariatric] (Katie line 457).

The choice of uniform and its impact on physiotherapists' ability to do their job and potentially reduce the risk of WSD was identified -

staff have got to be free and move so those things, uniform, rears its head from time to time (Peter lines 299 - 300).

Mandatory manual handling training, discussed in the theme The Job, emphasises the use of hoists and other equipment to reduce the risk of manual handling injuries or conditions. However, it appears that the handling of a hoist as an inanimate object poses problems that have not previously been considered. The increasing number of larger or bariatric patients, also discussed below, require specialist equipment that is not available at all facilities creating delays whilst it is appropriated, increasing the risks to physiotherapists and nursing staff. Increasing need for this equipment in terms of numbers and design, poses cost implications which need to be considered within the confines of an NHS budget and staff well-being.

5.2.1.2 Service provision

This second factor in the theme of Management/Organisation evolved from three sub-codes which included accommodating change in service delivery, patients and the environment.

Accommodating changes in delivery

Changes in physiotherapy service delivery were identified by many of the participants -

I think things that are contributing have changed over the years, definitely, because certainly the way we work and the way we used to work is very different (Katie lines 51 - 53).

Umm well there's going to be a / the service is changingfor instance physio's are working more flexibly these days (Peter lines 152 - 153).

The NHS' aim of moving more care into primary settings raised concerns to many in relation to increasing the risks of WSD -

And then if there's more community if you've got more restrictions on you, and you're working in environments that you don't know, that are you know possibly more risky environments to be handling people and things (Katie lines 419 - 422).

.... the community because you haven't got the option of changing bed height or umm necessarily the space to do what you need to do. Quite often you'd get yourself in to an awkward position to treat patients (Margaret lines 75 - 77).

Despite primary care increasing the hospital care provision it was also identified as being potentially detrimental to ward staff due to the inability to control the workload -

Well I think what it is, especially in acute, we have no / it comes through the door, whatever, we don't have a set number of beds, in theory we do, but we don't, because more can come in (Katie lines 142 - 143).

I don't know, like the general ward, and bed management. They're always after beds. There's always more people coming in the front door isn't there (Clare lines 94 - 95).

.... now nearly every patient on the ward needs physio (Katie, line 429) and the number of people coming in to the NHS, it's just growing (Peter lines 431 - 432).

Participants' comments suggest the changes in the NHS ethos has an impact on the delivery of the physiotherapy service which, in the institutional scheme, may not have been considered. In accommodating to the changes and their impact in both the primary and secondary settings, physiotherapy practices have had to be modified, increasing further pressure on the physiotherapists potentially increasing their risk of WSD.

A change within the out-patient (OP) musculoskeletal department, driven by the physiotherapy profession rather than the NHS, was identified as being potentially detrimental to WSD -

A spinal clinic is much harder, spinal assessment after spinal assessment is much worse on the body than a trauma clinic (Louise lines 289 - 290).

We went in to physiotherapists being ... practitioners by body part, however, you knowslowly but surely I think we're trying to get away from it (Peter lines 55 - 61).

Whereas a mixed caseload was recognised as being beneficial -

OP particularly, its so varied, which I think is a good thing, you're not stuck in a position you're always moving in different directions so I think from my personal perspective its, however much my ongoing lower back problems I find on a day to day basis I find its helpful (Louise lines 274 - 277).

The move over the last decade towards increased specialism aimed at improving patient care was not considered in relation to the physiotherapist's well-being. It had not been identified that repetition of similar patients and the type of patient, identified in the Job theme, could impact negatively on the physiotherapist. This trend is beginning to revert to a mixed case-load to vary work activities, in response to physiotherapists' feelings of de-skilling in other areas of physiotherapy in addition to the perception of increased risks of WSD.

The introduction of technology aimed at assisting service provision was perceived to potentially be detrimental to the risk of WSD -

We've got certain admin staff who will get every single you know down times minimised..... if you could put next to / or colour code your diary that you knew you had / spines were red, necks were in blue, you could try and adjust them, that would make sense, certainly think the variety would be better (Brooke lines 365 - 374).

The increasing use of technology within the NHS can carry with it implications that have not previously been considered either within the NHS's development strategy or in the literature. The quote above by Brooke demonstrates the impact that the use of an electronic diary by an administrator has on the physiotherapist. It reduces the professional autonomy of the physiotherapist as they experience loss of control of their own diary planning, and therefore patient type and rest periods. This directly impacts on work practices and fatigue, also identified in the Job theme, but a more subtle outcome can be in relation to motivation and job satisfaction experienced by the physiotherapist due to loss of autonomy. Autonomy in relation to work and an individuals' ability to experience control over their

role is recognised as being positive in relation to the individuals' well-being, absenteeism and return after absence and loss of this has implications which can be detrimental in relation to WSD. It is often reported in the media that installation of new technologies into the NHS are fraught with difficulties and it may be that the end-user of such technologies were inadequately considered with a resultant negative effect.

More positively, improvement in the ethos towards handling and changes in physical handling styles over time was acknowledged by the older participants who recognised that poor past handling experiences were no longer practiced and therefore past contributory factors to which they had been exposed, had been reduced -

..... um but I think one of the biggest contributing factors is that as a young physio manual handling was very different..... I think we were neglected as physios in those days cos the expectation was that you just did it. So I suspect that played a contributing factor over a number of years (Sarah lines 41 - 48).

Growing up as a neuro physiotherapy we were doing a lot of manual handling and therapeutic handling techniques, some that are outlawed now, that can't be done (Katie lines 53 - 54).

Although the older participants acknowledged these changes there was considerable concern that previous poor practice had caused them harm and that there was nothing that could be altered to mitigate against those problems. They considered that previous practice had profoundly impacted on their life and career and all participants in their 50s had re-deployed their work as a result of their WSD. This clearly links to the theme Individual. The increasingly aged work-force and retirement age was considered to be detrimental to WSD as was work practices in theme Job, therefore, despite improved handling practices overtime the accumulative effect of handling continues to be of concern.

Another change in service delivery as a result of changes in nursing practice where, nowadays, all patient mobilisation was deferred to physiotherapists was perceived to be an increasing contributory factor to WSD -

Yes, yes, generally, if they've been in bed for quite a long time, we're the first ones that are maybe getting them up (Margaret lines 167 - 168).

... it is always us getting the patients out, maybe because the nurses are short-staffed and they haven't got time to get patients in and out (Jessica lines 315 - 317).

This issue can be linked to the current NHS policy of minimal handling which is conveyed in the mandatory manual handling training as discussed in the theme Job, where nursing staff are required to use handling to minimum levels and use hoists and equipment as required. Physiotherapy therapeutic handling requires that patient handling occurs and it is perceived that this is their role and is therefore unavoidable, putting them at risk.

An issue that was considered could either contribute to safer practice or increase risks of WSD was that of the increase in flexibility in working within physiotherapy -

Its having that flexibility to keep people in work then you need to provide that support to keep them in work. Reasonable adjustment should be providing that sort of support I think. That's the sort of thing that would help (Blodwen lines 391 - 398).

Ironically good working practices, in terms of flexible working, being kind to the staff which is good. In my view what it does, it actually encourages people to cut down their lunch break so they can gain time.....That means longer working days. So some of that actually comes from what is good employment practice (Dick lines 100 - 106).

This anomaly between the desire to provide a good working environment where work/life balance and individuals' choices are supported and the negative impact that this can have on their well-being, has been recognised by management and there were strategies which had been implemented to monitor the situation -

.... and the other thing we're bringing in, is looking at job planning as well and really looking at peoples roles and you know how much clinical they should be doing (Katie lines 560 - 561).

Although the concept of job planning is a desirable one the effect of NHS ethos, financial constraints, changes in service delivery and staff shortages

suggest that it can be difficult to implement effectively to improve staff welfare.

Patients

Despite a number of strategies aimed at risk reduction there were aspects around the patient that were felt by participants to impact negatively upon WSD over which physiotherapists had little or no control. These included change in patient type with increased patient complexity, numerous comments were made regarding the increasing size of patients, the number of bariatric patients and patient unpredictability -

Totally more complex because they've got more co-morbidities basicallythe inpatient population is a much more complex population than it was you know a few years ago, for a variety of reasons..... So it's a very different population (Katie lines 426 - 435).

We're seeing more bariatric patients.....We have to rely more on equipment and making sure we've got multiple staff available and timing it so that we're not just two people going, as we normally would, to a first up patient, there might be four (Mary lines 274 - 285).

We've had quite a few instances cos obviously with patients getting heavier as well um, you've got more verging towards bariatric patients as well, I know we've maybe gone to do something and we've maybe sat down afterwards and said – it's too hard (Tina lines 125 - 128).

More so the unpredictability and heaviness of some patients I think has been the most contributing factor (Jessica lines 48 - 49).

In the factor; accommodation of changes in delivery, it was identified that there has been an impact on the type of patients who are located in the community or admitted to hospital care. Here it was identified that the patients now seen by physiotherapists are increasingly complex with multi-pathologies, and are generally increasing in weight. Handling these more complex patients put the physiotherapists at greater risk of WSD especially when unpredictable behaviour results in unexpected activity to which the physiotherapist must immediately react without planning. The increased risk associated with complex heavy or bariatric patients has not previously been associated with physiotherapists' well-being.

Environment

An environment not suited to current physiotherapy practice, in respect to patient and physiotherapists' needs, was identified by participants as contributing to WSD -

This hospital wasn't designed for the equipment that it now houses (Mary line 500).

But also our department has swollen and swollen and swollen so we are having to shoehorn desks, we are stuffed in terms of changing that layout (Dick lines 362 - 364).

The previous two extracts identified that the design of the hospital has not kept pace with the current throughput of patients. This is clearly outlined by two of the participants who identified how this impacts detrimentally on safe physiotherapy practice in both an inpatient and an out-patient environment -

You look at bed spaces, umm, you can barely get a locker in the side of it and maybe a chair..... And then you bring a hoist in that's this big..... you know they're working in very confined spaces which means that you give all this training on what posture to be in, what stance to have, to move things and you're thinking, well, I can't see how you can do that (Katie lines 283 - 288).

..... but also because of lack of space. If you're in small cubicle you've got a patient, maybe a relative of theirs in, two chairs, you've then got the plinth, and then you've got the chair that you're on..... there's not really room to bring in a little desk or anything like that. so I used to write, I used to have a little clipboard and just write my notes on my lap in that very hunched over position (Dave lines 160 - 167).

The constraints on the environment were also identified by participants as impacting negatively on the part of physiotherapy practice which is not patient hands-on which included patient note writing and areas for rest rooms -

We haven't changed the chairs since I've been here, 13/14 years, and you can't adjust the height they just don't have the equipment that possibly could help you (Brooke lines 246 - 250).

One thing is having chairs in staff rooms which are conducive to actually giving your back a rest when you're having a break..... Or having a staff room at all..... But that might be something that might make a difference if you are fatigued just to be able to have 20 mins, or

whatever it is, to relax. Might prevent further injury (Sarah lines 315 - 322).

The unsuitability of the working environments can also be linked to issues discussed above including the change in NHS ethos and the change in service delivery associated with it, the impact of this factor on the well-being of physiotherapists' WSD has not previously been identified. The type of patient treated and the turn-over that is now required of physiotherapy practice is hampered by the environment in which they must operate. It is of concern that the designs of new hospitals built recently in the vicinity do not adequately address this as corridors are wide enough for bariatric equipment to be manoeuvred but space around beds remains limited, office space for physiotherapists to write their notes is incorporated but staff rest rooms are not provided on wards or departments. Appropriate environmental design is recognised as being valuable in creating not only a safe environment but impacts on job satisfaction which can be linked to absenteeism and motivation to return to work after absence. Inappropriate environments experienced by participants increase their risk of WSD and potentially increases absenteeism and delayed return.

Summary of theme 1

This theme identified factors that contributed to the possibility of WSD and opportunities to reduce risk. An increasingly aged and complex patient population, increased demand and financial constraints has caused a changing ethos and priorities within the NHS. This change has resulted in changes in physiotherapy service provision which increase the risks of WSD. Management styles are able to partially mitigate against these factors but physiotherapists are obliged to work within the changing system and in inappropriate environments. A loss of autonomy associated with increased technology and an inability to influence the changes in ethos and delivery can impact on job satisfaction influencing WSD, absenteeism and return from absence. Figure 4 shows a diagrammatic representation of the factors of theme one on work-related spinal disorders in physiotherapy.

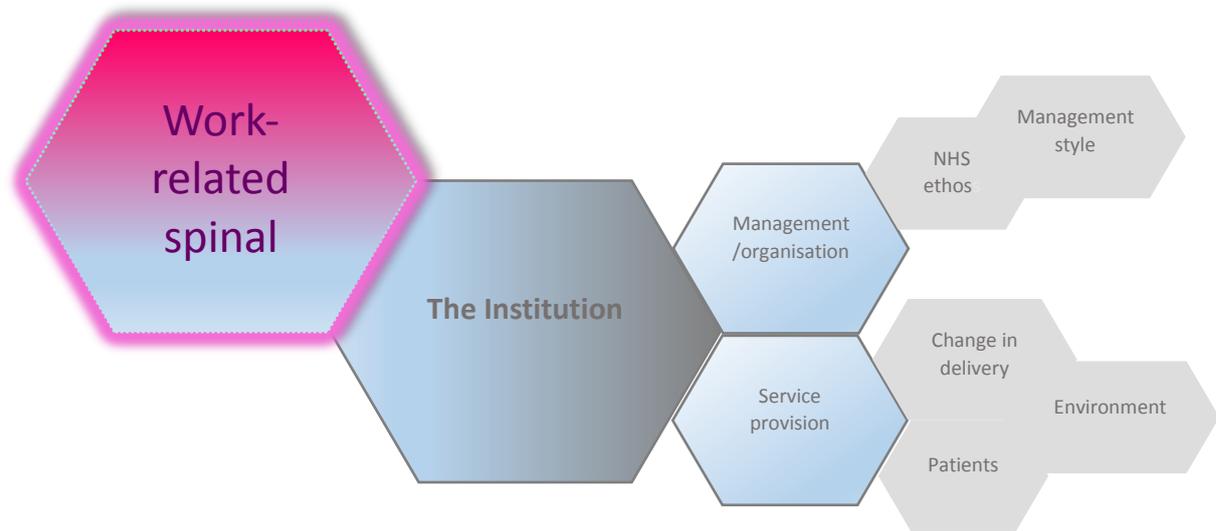


FIGURE 4: DIAGRAMMATIC REPRESENTATION OF THEME 1

5.2.2 Theme 2 – The Job

This theme was created from four factors – Physiotherapy Practice, The Team Effect, Handling and Risk Assessment.

5.2.2.1 Physiotherapy Practice

This factor evolved from five sub-codes which included the caring culture, work practices, increased administration, fatigue and caseload management and practice modification.

Caring culture

Participants identified that physiotherapists were caring people which was why they entered the profession, who put the patient first and who carry on regardless of pain, often to their own detriment in relation to WSD -

We are a caring profession we come into this because we want to help people (Dick line 135).

They always prioritise the patients, so I just think it's a general thing and whether that is because of the type of personality, health care professionals tend to be (Katie lines 134 - 135).

You don't really worry about the positions you're putting yourself in because you want tomake a difference to the patient it's putting other people before yourself really (Dave lines 185 - 187).

..... because people think, you know I've just got to get on and do it. The last thing we need to worry about is my back, so I think it's the nature of most physio's is that they just carry on regardless (Katie lines 100 - 102).

To do well but actually to do best by the patient..... that was the driving force and that our own health probably came 2nd. . . . (Sarah lines 156 - 158).

The participants' perceptions reflect findings in previous literature and was therefore anticipated.

Work practices

Work practices involving static, prolonged or awkward postures were recognised by participants as contributing to WSD -

..... which is a prolonged period of time to be in that static position, so I think a lot is postural kind of pain that people get as well (Dave lines 52 - 53).

Over the bed was quite an aggravating factor. You know doing that for quite lengthy periods of time (Sarah lines 91 - 92).

I think you're often in compromising positions (Lucy line 80).

The repetitious nature of certain practices, which has previously been recognised in the literature, and the accumulative effect over time, which was not strongly demonstrated in the literature, was another factor perceived by participants to contribute to WSD -

... even if you do do things as safe as you possibly can, there is still that repetition, that kind of doing that movement quite a few times, there's still that kind of repeated stress of doing it quite a lot, (Stephen lines 360 - 362).

.... and its not the once the twice the three times it's the repetitive (Dick line 188).

What we do is manual, is physical to quite a great extent and is sustained over days, weeks, months and years (Dick lines 350 - 351).

Following Dick's comment the physicality of the practice was also identified by the majority of the participants -

.... you do have to move them, you do have to support heavy parts of the body, so I think there's a huge risk to the physiotherapist (Brooke lines 38 - 40).

..... it is a manual job, it is a heavy job, and if you're doing that day in, day out, repetitively, anyone with a fantastic back is going to then compromise their own back (Dianne lines 611 - 612).

However, it was identified that it was possible that undergraduate physiotherapy applicants were not fully aware of the physicality of the job and the impact this might have on commencing their career in a fit condition to practice into the future -

I think prior to admission to the course I am not convinced that people are always aware of exactly how much the job involves and whether somebody is going to be fit....(Sarah, lines 359 - 362). And actually starting off your career fit to practice I think is importantif you start off at a disadvantage that's a tough one isn't it. Where are you going to be a few years down the line? (Sarah lines 344 - 346).

I think though the only contact I'd had, apart from a bit of work experience in departments, would have been having physio myself....I wouldn't be worrying about what job I'm going to go in to, because of injuries, I wouldn't be thinking that ... I'd be looking forward to getting in to an occupation that I was interested in rather than thinking, right, well, actually, that looks quite demanding, I wonder if that's going to exacerbate my back pain (Dave lines 311 - 323).

The caring nature of individual physiotherapists and physiotherapy culture has previously been recognised and it is often the driving force for entering the profession. This caring allows effective treatment to be implemented though this can be to the detriment of individual physiotherapists as they prioritise the patient above their own safety. It is not clear why this prioritisation occurs though it was identified in previous literature that physiotherapy cultural norms required it and that it was passed from generation to generation without necessarily considering the impact on WSD. The physicality of physiotherapy practice has also been previously recognised and has formed the basis of much previous research. The lack of knowledge by pre-entry and undergraduate individuals is newly identified as a contributing factor though the desire to enter the profession may obscure their interpretation of the impact.

Fatigue

The fatigue caused by the physical nature of the job, together with inadequate facilities to rest appropriately were considered by participants to contribute to WSD -

..... there is far less slack in the system if you like for people to rest, to break from sustained postures (Dick line 75).

.....so my back went into spasm as I had no rest periods. Cos I had to be on the hoof constantly as we had so many patients. And so I think intensity of work load without adequate rest (Blodwen lines 252 - 254).

In contrast it was identified that the acceptance of patient's un-met need, discussed in Management/Organisation factor, allows clinical staff to take breaks regularly to reduce risk of WSD -

.....you know there is no point in someone saying I'm staying late tonight to clear that, because it's not going to make any difference tomorrow, so it means that we have a staff group that do take breaks, you're not going to achieve what you need to achieve if you stay a little bit later, so you might as well look after yourself (Katie, lines 170 - 174).

The detrimental impact of fatigue on WSD has not previously been identified as contributing to WSD despite its apparent prevalence. In the theme Individual, female participants recognised that their multi-role requirements in work and home situations left them with little personal time so increasing the possibility of fatigue above that caused solely by the physicality and pressure of the physiotherapy work.

Increased administrative activities

Participants identified the increase in administrative duties required by physiotherapists, and the lack of appropriate facilities in different environments in which to carry these out safely, as contributing to WSD -

.....static positions when you're doing your paperwork, things like that, there is obviously a lot more admin nowadays than there ever used to be (Tina lines 76 - 78).

Maybe writing notes on wards where you're just trying to find any form of space that you can write your notes on the nurses' station or standing and leaning, or doing it on your lap (Dianne lines 265 - 267).

I mean the desk set ups. I mean everything is just crammed into a room that I wouldn't say is at all ergonomically designed. The seating is whatever seats you have available. I would say that side of things isn't supported from a health and posture side of things (Tina lines 230 - 233).

.....so there are issues with people sitting over a desk and spending long periods of time doing that, so there will be shoulder and neck issues attached to some of that, and probably some back as well (Peter lines 109 - 111).

This phenomenon is newly recognised as impacting on increased risk of WSD. The changes in physiotherapy service provision in response to the changing NHS ethos already discussed, together with an increasingly litigious society suggests that this new phenomenon will continue to increase and act as an increasing risk factor for WSD.

Caseload management and practice modification

A variety of methods to mitigate the contributory factors, and so reduce the risks, were identified by participants and included caseload management. A method often used to achieve caseload management was prioritisation of patients -

.... you have to prioritise and that you have to break your day down to know that when there's going to be another colleague that can help you see another patient (Dianne lines 560 - 562).

So we have very clear prioritisation tools (Katie line 176).

Additional to caseload management a number of practice modifications were identified by participants in a bid to reduce risks of WSD either in response to a specific spinal condition or in a bid to preserve ongoing safe practice -

.... when my back was particularly tender I tried to avoid treating (Brooke line 93).

We certainly have divisions in our work where there are certain tasks I would say – I can't do that – but I know that person can. Perhaps they have a longer reach or just a little bit stronger (Dianne line 102).

Umm, again, I'd have to say most people adapt their workload to cater to what they need to do (Peter lines 327 - 328).

Informal caseload management and practice modification have been identified in previous evidence as being routinely used to reduce risk of WSD though usually in response to ageing practitioners. This response in the ageing workforce was also identified in the Individual theme below. The formality of identifying and using these methods to reduce risks of WSD, which have developed from informal practices in response to health and safety awareness and/or litigation, appears to be newly recognised and benefits the physiotherapists by recognising their use in risk reduction.

5.2.2.2 The Team Effect

This second factor was created from three sub-codes – the team dynamic, mentoring and the negative effect of the team.

Team dynamic

The importance of the team, and team working, was identified by the majority of participants and was considered to be potentially both supportive and unsupportive in reducing risks of WSD. Positive team dynamics included caring for each other -

We just got on well as a team. I think it was just everybody pulled together and worked togetherso therefore we looked after each other (Blodwen lines 86 - 89).

It was the culture..... People were supportive of each other (Sarah lines 164 - 165).

All physio teams that I've worked in, have been quite tight knit and I think you always look out for each other (Margaret line 271).

..... so we're always making sure each other's alright, even if you've got a new member of staff make sure that they're happy with what they're doing as well (Clare lines 210 - 212).

Umm / I think because we work very closely as a team, and everybody knows the time pressures and the patient caseload we've got, you want to support your other team members (Mary lines 225 - 226).

The value of established teams was also recognised as being beneficial -

..... because I've been there a long time and worked with the same people for a long time so I don't know how tricky it would be if you weren't in an established team that you knew very well (Tina lines 114 - 116).

We do all work together quite a lot so you know when I think if you are in a position where you're getting more load, we'll kind of keep talking to each other and swap around if we need to, and you know, if anyone can't do a certain position for whatever reason, then we'll make sure that they're in the right place (Clare lines 198 - 201).

Good communication within the team was seen as necessary to allow an environment where all members' are valued in the identification and reduction of risk of WSD -

If you do try and create an environment where people can give their opinions, say what they think, no matter what level they are at... that's going to create a better team environment to be able to make decisions safer because you should really be considering everybody's safety (Stephen lines 307 - 310).

I'm generally quite lucky I think, where I've worked I've always got on well with the team that, if there was a problem, I would say, you know, like I said the other day, when I was helping with a patient, I was like this is too heavy, I can't do this, I can't lift the leg and things, and it's fine, you know, no one would ever be like well that's ... why can't you, you know, that's not good enough and things (Dianne lines 605 - 609).

And, having spoken to umm juniors, seniors... they've experienced similar things as well and it's only when you start talking to them that you can think of little strategies to overcome that and to make sure that you've got a good posture and working position during the day (Dave lines 173 - 177).

.... they are much more aware [manual handling] and people comment you know whatever grade of staff you are they feel that they can comment if someone else is doing it wrong, which is good (Katie lines 308 - 310).

In contrast less positive dynamics were sometimes encountered, usually around the impact of the team leads' character and poor communication, which are not enabling for safe practice -

.....even when I've spoken out or someone else has spoken out, and other people have backed it up, it's still gone down the way the more senior member of staff has kind of decided it was going to go this obviously doesn't happen all the time, but inevitably the more senior member of staff will put themselves in a position that is less stressful,

kind of put everyone else in that position where they are more likely to kind of potentially cause a bit more damage or cause a bit more stress to themselves and a bit more awkward (Stephen lines 333 - 342).

.... and then there's the whole expectation of seniors could be a factor I suppose umm again more negatively now in terms of you might think oh they're doing this, therefore I have to do this, I'm only the junior member of staff, this is the expectation (Lucy lines 169 - 171).

The value of team working is commonly acknowledged in many work environments and is of particular importance within the NHS where much, though not all, of physiotherapy practice involves team working. The participants who identified teams as being beneficial for risk reduction all related to experiences within the ward or community environment and no mention was made about teams from those within an out-patient environment. This difference reflects the different working practices within the clinical settings and suggests that certain factors will be setting specific. The team dynamic has been shown above to be perceived to reduce the risks of WSD and the caring nature of physiotherapists make them conscious of extending that care to their colleagues despite, at times, not caring for themselves. This dichotomy between self and colleagues is newly identified by these participants.

Mentoring

The mentoring of more junior staff, whether generally for safe practice or specifically for risk assessment, was seen by participants as being valuable in reducing risks -

Now that's [mentoring] something I'm already doing..... so every time I see that that member of staff is putting themselves into a compromised position, I'll be saying and I'll be reminding, so it's that constant cue (Dave lines 251 - 253).

..... a junior would work together on their [senior's] wards. That sort of thing would be useful. As I say the junior coming in that risk assessment isn't there. And unless they learn that from a more experienced member of staff it's very difficult to do (Blodwen lines 476 - 482).

Mentoring is recognised and routinely implemented within physiotherapy as a method of staff development though it is usually applied to clinical

expertise rather than safe practice. This discrepancy is recognised in relation to manual handling and risk assessment, factors discussed below within this theme, where mentoring was seen as a possible method of reducing risk of WSD.

Negative impacts of team working

Although it has been identified previously in the findings that aspects of team working were perceived to be very positive in the reduction of risk of WSD, there were also perceptions from participants, regarding possible negative impacts of this mode of working. Guilt about loading other members of the team if doing reduced activities or off sick was regularly mentioned -

As I said it's quite a small team that have been together for quite a long period of time. Yes I felt bad as people would take on the positions that were tricky for me or I would say I don't feel comfortable doing this..... But then you do worry if they are doing more (Tina lines 371 - 374).

I think umm a lot of the staff feel they need to come back from sick leave early rather than, if they have a bad back, come back before they could be 100% ready to come back. Umm because they don't want to feel that they're letting the team down (Mary lines 217 - 218).

The Band 8s also identified that the teams tended to continue to manage problems within the individual teams and it was not until the situation had deteriorated that the issues were taken to a higher management level -

If you've got a good work team they support each other, they would know amongst themselves and they'd discuss it amongst themselves. It might not find its way to me straight away (Peter lines 243 - 246).

..... most physio's they just carry on regardless..... because many a time I've had people that come to me and say, oh yes, I had it all last week and it's got, you know they come at the crisis point of which they can't work anymore people do work very well together and what you do find is but it's often another person that tells me they're muddling through, they've got back pain, people want to just get through (Katie lines 112 - 114).

The negative effects of working within a team, which may result from the caring nature of physiotherapists in relation to their colleagues as well as

their patients as previously recognised, are newly identified as a contributory factor for WSD.

5.2.2.3 Handling

This third factor was created from two sub-codes – manual and therapeutic handling and manual handling training.

Manual and therapeutic handling

The use of handling as a basic component of the physiotherapists' role has already been established in the physiotherapy practice factor, though many participants perceived that there was a difference between manual handling done by all healthcare professionals and therapeutic handling carried out by physiotherapists during rehabilitation -

The manual handling is this is how you use the machine to get a patient from here to there for maybe what nurses or other professions need to do. Whereas therapeutic handling you're using it for a patient to start to learn to walk again, whereas no one else would need to do that (Dianne lines 342 - 345).

The concept of treatment handling, referred to interchangeably as treatment, therapeutic and rehabilitation handling, was frequently considered to pose increased risk of WSD -

I think the whole aspect of manual handling in terms of your pushing the limits of manual handling in order to facilitate a patient doing something so where manual handling slips into therapeutic handling, you're often times pushing the boundaries on that and potentially putting yourself I think you're often in compromising positions (Lucy lines 75 - 81).

....so from the therapeutic handling perspective, it was quite a lot of demands (Dave lines 47 - 48).

..... therapeutic handling with a mixture of static postures as well as the heaviness of regular hoisting and regular assisting them therapeutically as well (Tina lines 50 - 52).

This identified that ward and community based physiotherapists segregated their understanding of handling into two clear categories. Manual handling is perceived to be carried out by all healthcare professionals and was protected by legislation, while therapeutic handling was the domain of

physiotherapists. It was perceived by participants that therapeutic handling required the physiotherapist to stretch the boundaries of the patients' abilities consequently increasing loading on themselves and thereby contributing to WSD. The perception that therapeutic handling could be operated beyond the boundaries of manual handling, despite being identified as a contributor to increased risk of WSD, could relate to the caring nature of physiotherapists who wish to do their best by the patient, or, it might suggest that physiotherapists are protective of their perceived role within a rehabilitation team and are willing to increase their personal risk to maintain that perception. It was apparent that participants who were from an out-patient clinical background did not perceive this differentiation of handling suggesting a clinical setting difference similar to that of the team effect.

In manual and therapeutic handling of a patient the use of equipment was recognised by the participants though it was perceived it could be both potentially beneficial and detrimental to WSD. There was a general consensus that the use of equipment to move patients and facilitate rehabilitation was beneficial to physiotherapists by reducing the load -

.... a piece of equipment, or technique that stops you having to put strain on your body lumbar spine (Louise lines 179 - 180).

Though it was also acknowledged by participants that using the equipment could, in itself, be a contributory factor -

Hoists, stand hoists, sling hoists and also things like slide sheetseven though you're doing it in the correct technique, that's still really hard work (Dianne lines 84 - 86).

I know it's a worry for some of the staff, is using these lovely big pieces of kit in the confined spaces that we have, is potential risk all the time (Katie lines 273 - 276).

The increased time taken using equipment was thought by participants to be detrimental as they perceived there was not the time available -

You can use hoists and things like that to give you that security but time pressures. You don't have time to use the hoists (Louise lines 206 - 208).

Time issues were also suggested as a contributory factor in relation to limited access to equipment. Accessing equipment or waiting for equipment

shared between wards meant that the delays incurred, potentially, lead the physiotherapists to attempt risky activities -

You cannot spend time getting hoists out You just have to think maybe I should, but you just can't (Louise lines 208 - 209).

.... and try and do it without that piece of equipment, then you will have a go doing it without that piece of equipment (Stephen lines 208 - 282).

A frequently voiced opinion was that there was inadequate equipment resources leading to moving of inanimate loads over distances, potentially endangering the physiotherapist -

....so you might not be able to get the equipment you want and then you might have to move it half way around the hospital first, which obviously, in itself, is a bit of a manual handling event (Clare lines 291 - 293).

Sometimes you're going from ward to ward to get hoists or anything like that, so you're dragging that hoist half way down the corridor to then bring it in to get the patient out, to drag it back again (Jessica lines 239 - 241).

The use of hoists and other equipment is now a fundamental aspect of physiotherapy practice, and although it was generally considered to be beneficial for staff, participants' perceptions of their value was varied. It was considered that the hoists, in their own right, posed a risk which could be reduced with better availability and maintenance reflecting the financial pressure on the NHS and the subsequent negative impact this can have on physiotherapists' risk of WSD. The negative impact of equipment use shows evidence counter to the commonly accepted understanding that equipment reduces risks of WSD.

Manual handling training

Manual handling techniques were considered by the older participants to have been different in their early careers potentially putting them at risk -

.... but it was when we still had the Australian lift and things like that still in vogue (Blodwen, line 77). We used the recognized lifts. But they were still lifts then (Blodwen line 91).

And it was lifts. I think we used sliding boards but we didn't have hoists, didn't have ...did we? (Blodwen lines 136 - 137).

Manual handling training, now mandatory within the NHS, was also perceived to have changed over the decades, from older participants identifying poor training through good and improving training to current students and early career physiotherapists being exposed to good manual handling training -

.....there's a combination of factors um but I think one of the biggest contributing factors is that as a young physio manual handling was very different (Sarah lines 40 - 41).

I think I was taught to a reasonably good level about manual handling ... I think it's become a lot more formalised. Hospitals recognise how much time is lost due to MSKDs but back pain in general... and they realise you have to invest in manual handling so there is much much more (Dick lines 260 - 263).

Umm there's education about it in university. The whole way through our placement and through all of the clinical teaching sessions that we had at university, we were constantly being told about our position and the best techniques to treat patients, not just for the patient, but also for us, so it's something you have an awareness (Margaret lines 221 - 225).

I've noticed in the students.... I think there is greater awareness of manual handling of their own positioning (Lucy lines 182 - 184).

I think the way they're [manual handling] trained now it's so black and white and specific that they are much more aware (Katie line 308).

Although manual handling training was perceived by participants to have improved through the decades the content and delivery of current manual handling training was perceived not to be relevant to physiotherapists' handling requirements, potentially contributing to WSD risks -

I just did the general manual handling and I don't think they account for the unpredictability of some of the patients, and just the way you sort of ... in different positions where you need to be, I don't think it's always accounted for (Jessica lines 128 - 131).

.....it does probably need to involve a physio specific manual handling (Stephen line 242).

I think some of it because it's for everyone isn't it, it's not physiotherapy specific (Margaret line 258 - 259).

.....it's very generic so mandatory training and manual handling, yes, umm, the difficulty is it's not very physio-specific (Lucy lines 192 - 193).

This issue has, apparently, been recognised though it was unclear whether this was by the manual handling training service for the LHB or by the physiotherapy service. As a result therapy specific manual handling training was identified as now being available which was perceived by some of the participants who had been exposed to it, as being beneficial in risk reduction -

Umm they have changed the format slightly. They were just doing the same kind of thing for all of us, but now they do like a therapies only one, which is better, targeted for us (Clare lines 249 - 250).

.... so it's a bit more specific to you, rather than just going through manual handling training as a generic thing (Dave lines 260 - 261).

The preferred method of training to reduce risk identified by participants was to have it embedded in clinical practice -

Yes, making any training as embedded within clinical practice as possible is the ideal (Lucy lines 212 - 213).

Well obviously your manual handling training I think it's more relevant on the job (Clare line 222).

....you're being shown on a regular basis by staff in a real life scenario, I think that would reduce the risks massively (Mary lines 472 - 473).

Several suggestions were muted to improve training embedded in practice -

....so having assessments by your peers in the work space, as opposed to in the manual handling unit, with patients who aren't real (Mary lines 447 - 449).

....but I think having someone within the team who can almost sort of run audits and can almost sort of run in-service training sessions, that I think would help to keep it a bit more specific to physiotherapy (Stephen lines 402 - 405).

....there will be differences in the way perhaps you would approach your kind of manual handling and therefore kind of approach your

overall back care and health, so maybe just having someone who is perhaps a Back Champion (Stephen lines 409 - 411).

The general consensus in the participants about the lack of specificity to physiotherapy of manual handling training suggests its relevance is insufficient to physiotherapy practice to encourage physiotherapists to adopt good handling practices, increasing their risk of WSD. The participants' perception that they know more than the manual handling trainer adds to lack of engagement with the training and can be linked to the attitude towards WSD identified in the Individual theme, below, where a feeling of invincibility in younger physiotherapists was recognised. Embedded training whilst untenable within the current resources would be valuable to be incorporated into mentoring as previously recognised in the mentoring factor previously discussed.

However appropriate the manual handling training was participants' attitude towards it, and the value with which they regarded it puts them at risk of WSD -

When you see with the students, when they are having all this education about looking after their backs some of them are just not interested (Louise lines 118 - 120).

Between you and me I'm not sure that people have the right attitude to mandatory training.....I think it is not seen as the most important part of your job. It's very easy just to see it as a check box (Margaret lines 243 - 245).

I think because it's something we do every day, we can arrogantly think that we know how to do it (Margaret lines 253 - 254).

But a lot of the time we're obviously using all the equipment and everything day to day, so it's not necessarily teaching you anything new (Clare lines 271 - 273).

Subsequent to manual handling training many participants identified that lack of implementation of its strategies puts physiotherapists at risk of WSD -

.....it's just I think the regard for it, I think people just don't make the effort to do it how they should (Margaret line 268).

....my strong opinion is that, from manual handling, its things we are taught, we just don't put in to practice ourselves (Dave lines 240 - 241).

....it's not that it's gone out of your mind, it's just that you're not putting it in to practice (Dave lines 255 - 257).

The attitude towards manual handling training can be associated with the perceived relevance to their practice and their relative knowledge. The reasons for the limited implementation of training can also be associated with relevance but could also include aspects of factors discussed in theme Individual regarding personal strength and invincibility. To increase the value of mandatory training its relevance and implementation in relation to the profession needs consideration to make it effective in reducing the risk of WSD.

5.2.2.4 Risk Assessment

This fourth factor was created from two sub-codes – value of risk assessment and use of risk assessment.

Value of risk assessment

Despite risk assessment being an integral part of manual handling training many participants did not mention risk assessment until prompted, at which stage they identified that risk assessment was useful in risk reduction -

.....and I think they are good and used correctly they are good (Jessica lines 175 - 176).

If you've done your risk assessment properly then as soon as you feel there is something that is happening that is going to be out of your control then you stop (Blodwen lines 276 - 278).

Although generally considered valuable some participants' attitude towards risk assessment can make them more at risk of WSD -

So we all know who is going to be a high risk patient, who needs extra measures (Mary lines 327 - 328).

It is protecting you beyond anything and still staff don't fill it in (Katie line 107).

The conflicting perceived value of risk assessment was an area that could easily impact upon the risk of WSD especially as the manual handling

training discussed above is based entirely upon its use. If risk assessment is perceived not to be greatly, or variably, valued it will impact upon its use, or lack of use, and decisions made by physiotherapists regarding handling activities which can be detrimental to WSD.

Use of risk assessment

The variable perceived value of risk assessment highlighted above was surprising as across Wales there is a national system of risk assessments for physiotherapists aimed at reducing risk of WSD. The apparent limited awareness of this system identified by participants was a reason contributing towards the perceived value of risk assessment -

You can say the words and they'll register in my mind but I wouldn't be able to tell you anything else (Dave lines 409 - 411).

Despite the ignorance of national guidelines many participants identified that risk assessment was carried out though very often on an informal basis -

Informal risk assessments. I never do a formal risk assessment (Margaret line 300).

So it's not a formalised risk assessment, it's me informally looking at that patient and knowing what my procedure involves and making a judgement call on whether I can do that or not (Lucy lines 232 - 234).

I think you do a lot of risk assessments in your head without writing it down (Clare lines 323 - 324).

Informal risk assessment is of concern for increased risk of WSD if, as identified by participants, it is often carried out after a risky event rather than preventatively prior to the activity -

Again very informally. It may be every now and then if you happen to put yourself in a bit of an awkward position (Stephen lines 213 - 214).

The use of risk assessment, whether formal or informal, was identified by many participants as being inconsistently applied -

Well, in theory, they are meant to be for every patient is risk assessed..... They are not used as thoroughly as they should be used (Katie 233 - 236).

It's done on some rotations, I wouldn't say all, I wouldn't say it's consistent throughout (Dianne lines 526 - 527).

They're quite hot on it. In certain hospitals or certain departments it does vary (Dave lines 416 - 417).

Reasons for inconsistency was identified as being due to the perceived risks within the clinical speciality or the perceived risks around an individual patient -

yes, but then I think neuro, it's understood that almost all the patients are a kind of a more of a manual handling risk whereas orthopaedics might just tick the top box to say that they're at no risk (Dianne lines 526 - 531).

I think if there's someone you know is going to be difficult to handle, then a risk assessment's done, but it's not used as a key (Jessica lines 180 - 182).

Several participants suggested reasons why risk assessment was carried out in an informal and selective way -

....but because a lot of the time you were filling it out and it came to there's nothing to worry about here, umm, they can start to fall by the wayside (Margaret lines 312 - 313).

.....people tell you they don't have time to do any more paperwork (Katie lines 238 - 239).

I don't think they're used as much as they should be. Time being some of the essence of it (Jessica lines 169 - 170).

The behaviour around risk assessment was perceived to be an area which, if improved, could reduce the risk of WSD -

.....it should be a very very basic standard thing and everyone should do it, you should always kind of risk assess everything including yourself and what you're doing, that is one of the very very basics.....I realise there's perhaps one area ... not necessarily a weakness, but something that just needs kind of reminding a little bit more (Stephen lines 204 - 211).

The variability in perceived value of risk assessment, its informal use and erratic implementation was of particular concern as all manual handling training is based on the use and implementation of risk assessment. This can suggest that there is a link between risk assessment and the attitude

towards manual handling training highlighted above. Physiotherapists' perception of the relevance of the manual handling training content, together with the relative knowledge of the manual handling trainer may extend towards their engagement with risk assessment. The current engagement with risk assessment identified by participants potentially increases their risk of WSD.

Summary of theme 2 - The Job

This theme has recognised previously attributed factors contributing to and reducing the risk of WSD and identified new factors. The previously recognised caring nature and culture of physiotherapy and the work practices of the profession, caseload management and practice modification were affirmed. Newly identified factors included increasing administrative activities, formal recognition of caseload management and practice modification.

The value of team working has previously been recognised in many situations though its specificity within a clinical setting is newly identified. The negative effects of team working which can be related to the caring nature of physiotherapists, has not previously been recognised in the literature but has been identified as part of this thesis.

The understanding of manual and therapeutic handling is quite disparate though the reason for this can only be speculated. Clinical specificity of differentiation between manual and therapeutic handling is newly identified. The perceived relevance of mandatory manual handling training, physiotherapists' attitude towards it and its implementation is newly recognised as a contributory factor to WSD and warrants investigation to improve its value in reducing risk of WSD. The perceived value of risk assessment and its use and implementation was newly recognised as being contributory to WSD and can be linked to perceptions of manual handling training. These potential links require further investigation to ensure the best impact of manual handling and risk assessment in reducing risk of WSD in physiotherapists.

Figure 5 shows a diagrammatic representation of the factors of theme two showing the increasing multi-factorial nature and the interconnectedness of those factors.

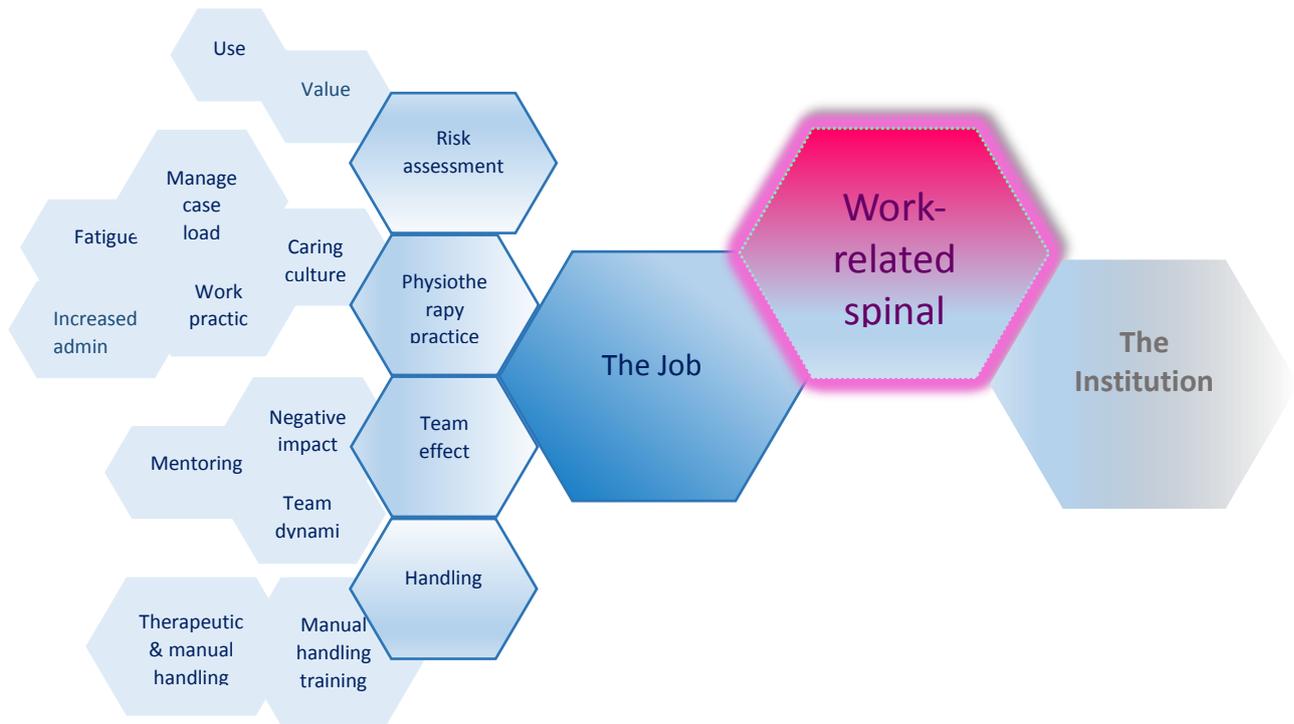


Figure 5: Diagrammatic representation of theme 2

5.2.3 Theme 3 – The Individual

This theme was created from two factors - physiotherapists' career timeline and personal responsibility.

5.2.3.1 Physiotherapists' career timeline

This first factor evolved from three sub-codes which included youth, through the career and older age.

Youth

The term youth, upon which the participants reflected if they were no longer within this career stage, incorporates practice as a physiotherapy student and in an early career stage. During these times participants identified issues which were detrimental to safe working practice which were perceived to contribute to WSD.

The most pervasive comments regarded the infallibility of youth and the thought that WSD would not happen to them which has already been identified above as being linked to the inconsistent use of risk assessment to reduce risk of WSD -

..... we had this belief as we were all in our 20s – the common saying was “we could walk a dead horse between 2 physios”. Because we felt we were infallible (Blodwen lines 56 - 59).

..... when you are younger you don't want to necessarily think about what you are doing. Because we don't think it will happen to us (Margaret line 214).

..... you might be tempted to do it thinking it's not going to happen to me, it will be fine (Mary lines 74 - 75).

In addition to the lack of consideration of WSD in their youth highlighted in the previous series of quotes the participants identified that there was little or no consideration of the future impact of their behaviour -

Umm / I don't think very many juniors are very switched on to how to look after themselves in the workplace and I think the younger we are the more frivolous we are with it..... think that, if we don't have problems now, we're not very good at thinking about how to prevent problems in the future (Margaret lines 209 - 212).

I don't think we really stopped to think about the impact. We felt we were doing everything right. It didn't hurt at the time so therefore you carried on (Blodwen lines 62 - 63).

I was putting rehabilitation as a priority and didn't see it necessarily as a direct ...because I was strong enough and big enough to do that. What I wasn't taking into account which was something I did know which is the accumulative effect (Dick lines 212 - 215).

.....but then don't necessarily think actually, long term, if I did this over a sustained period of time, that probably isn't going to help my back (Stephen lines 67 - 68).

The perception demonstrated by participants that physiotherapy students are generally fit people contributed to the possibility of increased risk of WSD and was clearly linked to perceptions that WSD would not happen to them as student and early career physiotherapists because they were strong, fit and sporty -

.....if you are sporty, you're strong, fit those sorts of things.... When we are educating students I will talk to them and I will say- just about every physio I have spoken to has had a bad back at some point. And they will look at you and I will say - you will all believe it won't be you – there's a reason as these are fit people who have ended up with bad backs and part of it is because you think you are big and strong(Dick lines 429 - 433).

Just because they [students] are fit and healthy and strong. Often it's a thing with human nature until a thing becomes a problem you're not so aware about dealing with a problem until you've got it (Louise lines 126 - 127).

The attitudes and behaviours of student and early career physiotherapists, recognised from the last three series of quotes, were perceived by participants to change during the transition from being a student to a qualified practitioner a phase which was perceived to be contributory to risk of WSD -

I think going in to something where, from being a student, where you are doing monthly placements whereas when you get in to the clinical environment, as a qualified, where you're working most of the time without that rest, it's more than a month, I think the demands catch up on you a little bit andI didn't realise how physically demanding the job was, when I went in to that first rotation, and I think that's where I suffered (Dave lines 96 - 102).

Following the transition from student to a qualified band 5 physiotherapist, highlighted by Dave, was further recognised as a period during which the impact of the behaviours adopted as an undergraduate and as a new graduate could have detrimental effects in relation to WSD. The limited clinical experience of early career Band 5 physiotherapists was also perceived by participants to potentially increase their risk of WSD at that stage of their career -

I think when you are a band 5, particularly new, just starting out, you do perhaps think a little bit more about your patients and less about your own safety. And then with that you don't necessarily then have the experience of knowing what is that optimum position to be in for the handling and also for looking after yourself as well (Stephen lines 86 - 90).

It was my first job.... I didn't know whether it was a normal thing or not ... so for me it wasn't normal, but was that normal to get a bit of a backache when you're in that job environment (Dave lines 126 - 130).

[as an experienced practitioner] *as soon as you feel there is something that is happening that is going to be out of your control then you stop. I think that comes with experience and I think our students are more vulnerable and juniors are more vulnerable (Blodwen lines 277 – 280).*

My neuro handling definitely isn't as good as the senior members of staff and I was like, I can't do this, this is too hard, too much heavy lifting, mainly because I was probably making quite hard work of it as well (Dianne lines 408 - 412).

....there is an element of you don't always necessarily know what is the best position to put yourself into because of the experience of being a Band 5, so obviously if you've been doing it for years and years, you have a bit more of an experience of well, actually, that is a good position to be in (Stephen lines 81 - 85).

In addition to the limited clinical experience of the band 5 physiotherapists, highlighted above, participants felt the rotational nature of the work to which band 5 physiotherapists were exposed contributed to an increased risk of WSD at that career stage -

[rotations] *I don't know the work as well, I'm umm not thinking about myself, I'm thinking about everything that I'm trying to pick up (Margaret lines 85 - 86).*

I think the other thing is is when you're a more junior member of staff you're rotating. Umm means that you try, or you do things that you possibly wouldn't otherwise do. So ifyou're only there for three months, you may try things, but if you think I've got to do this year on year out, for the next 40 years (Lucy lines 161 - 168).

There is robust evidence in the literature which recognises that the most vulnerable physiotherapists, susceptible to WSD, are early career physiotherapists within the first five years of their career. The perceptions of these participants therefore reflects this trend. Few studies have included students however participants in this study clearly identified that they perceived physiotherapy students to also be at an increased risk of WSD similar to that of early career physiotherapists. Although lack of clinical experience was promoted as the main reason for the increased risk it could feasibly also be related to all of the factors under the theme Job, where the impact of physiotherapy practice and the team influences the early career

physiotherapist. The early career physiotherapists' understanding and values attributed to handling and risk assessment was influenced by exposure to more clinical settings and different teams and colleagues impacting on their risk of WSD. The rotational nature of band 5 physiotherapy roles and its subsequent perceived impact on increasing risk of WSD has not previously been recognised.

Through career

The consequences their behaviour in their early career has on their spinal condition as they aged was identified by participants as impacting on WSD during their progressing career -

I am aware around the age of 30, arthritic changes, I'm probably hitting that stage already. I've probably got arthritic change. That is going to worsen with time but I'm doing everything that I can possibly think of to manage the problem (Dave lines 436 - 441).

I certainly see a massive trend amongst people I know as being, yes, 35 to 40, as having back pain, developing, if it's not new onset, certainly a severe bout (Brooke lines 238 - 239).

My back might ... I might not last 40 years (laughs) with my back. And I might have to look at not necessarily a career change, but a different environment for me, within physiotherapy (Dave lines 456 - 459).

As identified in theme 2 physiotherapy practice and team effect support with respect to safe physiotherapy practice was available and usually constant for early career physiotherapists. However, there was a variable perception of the support regarding safe practice and reducing risk of WSD, for staff beyond their early career -

.....you really have to get the position right, but I certainly think that once you qualify, nobody is really looking at your position and it's not assessed, it's not sort of / we don't see it as much of an issue if I watch somebody, as long as they're getting the job done (Brooke lines 301 - 304).

I think if you've gone through that situation it brings it to the forefront of your mind for you to pass on that information because you don't want to see one of your colleagues in the same situation (Dave lines 452 - 454).

Though more positively, the increased experience and ability to adapt their practice was thought by many participants to reduce the risks -

Umm I think awareness that I'm not bionic and invincible, so having experienced some level of discomfort and weakness and being more aware of my limitations, so that's come through experience (Lucy lines 157 - 159).

....but I would think the skills of a mature umm clinician in the work force, they've learnt a lot of things that aren't written down on paper, and they've managed to..... adapt their working day (Peter lines 338 - 342).

I think they get wiser (Peter line 330).

The increased risk of WSD in early career physiotherapists is well established though the effects of early career behaviour and its impact on the potential for WSD, through early spinal ageing and possible increased potential for WSD, has not previously been recognised. It is clearly demonstrated that Band 5 rotational roles are perceived to be detrimental to safe practice though consideration of the stages of a career and its effect on risk factors for WSD has not been previously made. In mitigation, increasing experience through a career span was perceived to reduce the risks and can be linked to factors within physiotherapy practice identified in the theme Job. It is possible that there will be contradiction between these factors as increased fatigue and increased administration activities, identified as increasing the risk of WSD, can increase through a career's progression.

Older age

In addition to the positive effects of clinical experience developed through a career span further adaptations made to enable a long career as a physiotherapist were noted by participants, though longevity was itself identified as being a contributor to WSD -

I would say you learn to pick your patients as you become more experienced of what you will and won't do and things (Dianne lines 417 - 419).

..... and also that I was getting older um I then had more considerable lower back problems – prolapsed disc and then the recovery from that (Sarah lines 84 - 86).

Of real concern to many participants was the impact that an ageing working population and later retirement had on the risks of WSD -

[Retirement 65 +] It's quite an endeavour. Even as a manager, never mind as a clinician with physical challenges, umm, and people expect more from physios. I can only see that is going to be a growing challenge for the future (Peter lines 349 - 351).

.... but in our department here, I'd be the oldest by some way, as a manager. Clinicians, you know, in their 40's, most of them, that's the oldest (Peter line 359).

We are actually being asked to work longer,and our job is physically demanding and this is one of the arguments we have put against people working into their 60s and 70s (Dick lines 442 - 444).

.....the effect of that could be as people work longer ... you'll therefore have a workforce which is older and not so fit and strong just because age has taken its toll – therefore what effects will that have on their colleagues? Actually if they are then doing the less physical things, which they might well be if you cut the oldies a bit of slack, therefore by definition the younger people will have a proportional rise in the physicality of their job. And so we go on.Doomsday (Dick lines 457 - 463).

..... and people are staying put. so you know, we do have a lot of people that have been in Band 6 roles a while and things like that, there's not the opportunities for them to go and do other types of work and things like that, we will have people doing those clinical roles (Katie lines 403 - 407).

Though for some participants this anxiety was managed through humour -

.... and you know with all this we're supposed to work till we're 68 and I just / the patient's going to get to the treatment room quicker than I am (Lucy lines 123 - 124).

I can't see me doing an inpatient manual handling job at 67.....Going up to a patient with my own Zimmer frame demonstrating how they should walk with theirs. I can see it coming! (Mary 360 - 365).

Previous literature has suggested that physiotherapists adapt their practice to ensure longevity in their career and this is reflected in the perceptions of the participants. The impact of an ageing population and the changes in

retirement age inevitably results in an ageing workforce which has an effect on the individual physiotherapist and potentially their colleagues.

Anecdotally, currently older physiotherapists are infrequent in the workforce and if present are unlikely to be working in a clinical capacity which is reflected in the participants the oldest of whom were 57 years, who retired on health grounds 6 months post interview and 56 who, nine years away from retirement age, was in a managerial role. This issue is a fairly recent phenomenon and the ramifications on the workforce, the service and the individual are as yet unclear and will clearly be a future research area.

5.2.3.2 Personal responsibility

This second factor was created from four sub-codes all of which were closely interlinked – personal fitness, knowledge and personal care, accessing support and lifestyle.

Personal fitness

The physiotherapists' personal fitness and its ramifications was identified by all participants and, depending upon the context, was considered to potentially contribute to, or be a means of risk reduction for, WSD.

The individuals' fitness levels was considered as important to reduce risk and participants felt that the physiotherapy population was fitter than the general population which was necessary for safe practice –

Umm keeping yourself quite fit and healthy helps I think. I mean we're all, as physio's, generally quite active people. I think that probably helps (Clare lines 485 - 486).

Umm I think they need to remember that it's a physically demanding job and they need some element of personal fitness to be able to maintain longevity in this kind of role.....it's demanding and the body needs to be able to cope (Mary lines 414 - 418).

There was a perception amongst the participants that decreasing fitness in the younger population can put students and early career physiotherapists at greater risk, although this contradicted the perception previously presented in the comments about youth, that undergraduates' high fitness levels also makes them more vulnerable -

.... lifestyle of today's youth and our students, even if they are fitter than average in my opinion at a lower level of fitness (Dick lines 250 - 253).

.... that we actually were fitter perhaps than the therapists todaywe were just fitter in handling patients because we did it more (Katie line 265).

The general perception that physiotherapists were quite sporty brought with it issues around sport activities making people more susceptible to injury which can then predispose WSD -

I think they're a very fit group in that they do so many sports and we have so many injuries (Katie line 262).

..... perhaps some sporting injuries contributing to it (Sarah line 58).

And with that feeling of fitness came a potential for physiotherapists to feel immune -

There's a bit of kind of invincibility about people umm because you know a large proportion of physio's are fairly fit and active (Lucy line 84).

..... we are physically fit we will often feel we are a bit indestructible (Dick line 178 - 179).

Almost all participants saw the importance in maintaining fitness for the job and actively worked at it -

.... so it's maintaining the physical fitnessYou can't just assume somebody's fit to do it. They have to do things, stretching and preparatory and maintenance work themselves (Peter lines 74 - 77).

.....they have quite a kind of high level of responsibility of self-health care management, maintaining their own fitness and health (Lucy lines 85 - 86).

....[lumbar pelvic control exercises] so this is what I've been addressing outside of work and its helping now in work, to the point where I don't get any problems during work (Dave lines 342 - 343).

.....I know, if I don't go to the gym, I then start to get more back painSo, yes, I do try and protect myself (Jessica lines 101 - 102).

And I'll know if my fitness isn't good enough. I'll know that I'll notice that in work. It means I have to do it [exercise outside work] (laughs) it's a chore (Dianne lines 301 - 302).

This consideration of the individuals' responsibility has not previously been recognised in the physiotherapy literature but has been identified as part of this thesis. It was clear that fitness levels were considered important in helping to reduce risks of WSD and that it was the individual's responsibility to maintain that level. The necessity to exercise specifically for fitness to work was recognised, though the impact of lifestyle on this is presented below in the section on lifestyle. There was recognition that the perceived reduction of fitness in the general population was reflected in the younger physiotherapist population.

Knowledge and personal care

The responsibility to care generally for self, which was recognised by all participants, has not previously been identified -

It's taking individual responsibility for your own health really and it's highlighting, when you think something's not right (Mary lines 406 - 407).

.... I think you should take responsibility for your actions (Jessica line 277).

There is definitely an individual responsibility to looking after yourself, definitely (Stephen lines 439 - 440).

More specifically in taking personal care there was a perception that there was a lack of application of knowledge which participants had about WSD, resulting in poor work practices -

So actually there are lots of physios with back pain so knowing what to do doesn't stop you from getting it (Louise lines 151 - 152).

..... they say, I know all this, I just don't put it in to practice (Dave line 238).

Being able to apply knowledge of WSD required that participants actually had the knowledge to apply, though many participants felt that this

assumption, that physiotherapists had the knowledge, was not always true, potentially putting people at risk of WSD -

I think they assume that we know how to look after ourselves, especially because we're physiotherapists and we know all about backs (Margaret lines 203 - 204).

.....lot of physio's, will not have that knowledge on why they are getting the back pain and what they can do to address those problems (Dave lines 380 - 381).

Once WSD was present it was felt by participants that often physiotherapists treat themselves, regardless of their knowledge level, or ask a colleague to treat them informally therefore reducing efficacy and increasing risk -

I managed my condition because I had a physio head on (Blodwen line 212).

Yes, well I'm a physio, so I've done all my core stability exercises, and things (Clare lines 345 - 346).

..... just have a quick look, will you just quick manip my back and that's not good for you, as a professional, and it's not helpful for the person who is seeing you because often times they haven't got a proper history, they haven't got proper notes (Lucy lines 331 - 334).

The idea of physiotherapists taking responsibility for their own care has been recognised in literature with regard to physiotherapists' treating themselves, and each other, once injured. It is newly recognised with respect to general self-care and the assumption of appropriate knowledge with which to do this successfully.

Accessing support

Despite physiotherapists often self-managing or treating their WSD, the availability of an Occupational Health department was seen by many participants to be a valuable service in managing and reducing the risk of WSD -

...when you come and see me [occupational health] you're formally going, right, this has become a problem to the point that I want to see some independent objective advice I'm going to, you know seek advice (Lucy lines 327 - 329).

Yes, and I know that if it gets to a point that ... I know that I'll just go to occi-health and then I would be treated by a physio there (Jessica lines 575 - 576).

..... occupational health is there all the way through that, for advice or for treatment consulting occupational health, so it's quite good to support the staff in that environment (Peter lines 185 - 187).

Unfortunately, the uptake of accessing Occupational Health was limited for a variety of reasons -

I don't see any purpose of going to occi-health for physio because they're going to tell me what I need to do which I already know (Jessica lines 595 - 597).

Perhaps they feel like they shouldn't have it would be one thing, you know, seems a bit of a weakness (Peter lines 190 – 191).

The main reason for not accessing occupational health services was around the concept of fear of disclosure of WSD and the impact that could have on their career. Lack of disclosure of WSD can potentially further increase individuals' risk of WSD-

...a loaded environment in terms of you're then questioning their ability to do their job and does this mean I'm not going to be able to work and, if it's on my record, will this penalise me in some way, shape or form (Lucy lines 343 - 345).

....the ultimate thing is is this going in some way mean I can't progress through my career or umm yes, affect my ability to do my job, if I access occupational health (Lucy lines 349 - 351).

Fear of disclosure due to a perceived negative impact on career prospects could be linked to the current NHS ethos where there is an apparent blame culture with a policy of whistle blowing on colleagues' behaviour. Within the constrained financial climate it could be considered that to fund staff support services, which staff feel unable to access, as inappropriate. The one occupational health physiotherapist participant identified that there was a high uptake of the service by nursing staff which suggests that not all staff feel that disclosure of WSD could be career detrimental and investigation of this discrepancy warrants further exploration.

Lifestyle

It has already been indicated that sports injuries incurred by physiotherapists outside of work, could predispose them to WSD but other lifestyle issues were identified.

Pregnancy was recognised by female participants as having a negative effect on their, and others', potential to work safely -

I suppose there's quite a lot of females, there's a lot of them getting pregnantso then you've obviously got to be extra careful with them about what position you put them in, so other people might like have to take a bit more strain (Clare lines 419 – 423).

I think for me children was my issue and then having children, then carrying children strain on the lower back (Tina lines 185 - 186).

....there's no cover for maternity leave, most of the time. So there is nobody else to pick up your job other than your other team members who are already doing their jobs (Mary lines 233 - 237).

Comments on the effect of pregnancy were only made by female participants despite pregnant physiotherapists working within teams including male colleagues. Consideration by male physiotherapists of the impact of working whilst pregnant did not appear to be considered by the male participants.

It was apparent that risk assessments were done for pregnant physiotherapists, to reduce the risks of WSD, but that returning to work post childbirth was less well managed -

....we do risk assessments with pregnant therapists, so you know, as soon as we know someone's pregnant (Katie lines 490 - 491).

[on return from maternity leave]yes, you just go back in to the team I guess (Clare line 427).

So the person coming back [from maternity leave] will normally just pick up something that they would do. So we don't take the work off them, we just change what it is they're doing (Mary lines 262 - 268).

Once birth had occurred the impact of a family and the work-life balance, in relation to time for self- fitness, part-time working and finances, was recognised by many of the female participants as being detrimental to their

spinal health though was not mentioned by any of the male participants suggesting that the burden of family care predominantly remains with the female. The impact of a family on time to maintain fitness, previously established as being valuable to reduce risk of WSD, can make these physiotherapists more at risk of WSD -

No, you've got to find time for yourself to do it [exercise] but I finish work at three and pick the kids up 10 past three so there is no down time. There's no leeway (Brooke lines 113 - 115).

....its finding the timeto find the time to do some exercise, fit in some things to help with health and fitness (Tina lines 269 - 271).

I think you can anticipate that life takes over as you get olderso with family and things you just have less time to do it [exercise] ...certainly without the family, you have more time to dedicate to activity (Louise lines 90 - 94).

Part time and unsociable hours working was recognised by women, though not by men, as impacting on the individuals' health and wellbeing in various ways potentially leaving them more susceptible to WSD -

Part-time working - you end up staying later to do that. And then you're rushing around to go and get the children (Tina lines 282 - 284).

Yes and working part-time and the days you have off are not just days off because you spend that day catching up on things at home. But then, you know, working one in four weekends, you are adding another eight hour shift, which is a bit of a killer (Brooke lines 143 - 147).

Um, I think probably in the days after I had had children it would be my life style during the days. Because I worked evenings when my children were small I would have had a day with a toddler, a baby all that that involves and then an evening's work. So you start work tired (Sarah lines 133 - 135).

It was apparent that part-time working highlighted previously can often be outside of normal working hours, including evenings and weekends, and therefore following a day of family care. This has already been suggested as a reason for commencing work fatigued which was identified by participants as an increased risk factor for WSD. The reason usually suggested by participants for part-time and unsocial working hours was to avoid the costs

of childcare and the negative impact of financial pressures was recognised by some -

But financial pressures, you know, and not getting pay rises, you have to do more I've extended my hours so I literally have no down time (Brooke lines 149 - 151).

The lifestyle factors have not previously been identified within physiotherapy. The main lifestyle issues recognised highlighted the difference in the male and female role within a family and work situation and impacted more on female participants than male thus increasing the risks of WSD in female physiotherapists who constitute the majority of the profession.

Summary of theme 3 - The Individual

This theme affirmed previously recognised factors and highlighted new factors. The vulnerability to WSD of early career physiotherapists is well established in the literature though the detrimental impact of the rotational nature of early career positions was newly recognised. The influence of career stage and the ageing workforce was newly recognised as impacting on WSD risks. The impact of personal fitness and the need to maintain fitness specifically for work and the perception of the impact of decreased fitness in the general population on physiotherapists in early career was newly recognised. Self or colleague treatment of WSD reflects previous literature though it is newly recognised that there is an assumption of appropriate knowledge with which to do this successfully.

Although the idea of physiotherapists taking responsibility for their own care has been recognised in literature with regard to physiotherapists' treating themselves, and each other, once injured the responsibility for self-care and appropriately accessing care support has not previously been identified. The issues around lifestyle impacts on risks of WSD are newly identified.

Figure 6 shows a diagrammatic representation of the factors of theme three demonstrating the increasingly multi-factorial nature and the further interconnectedness of all factors.

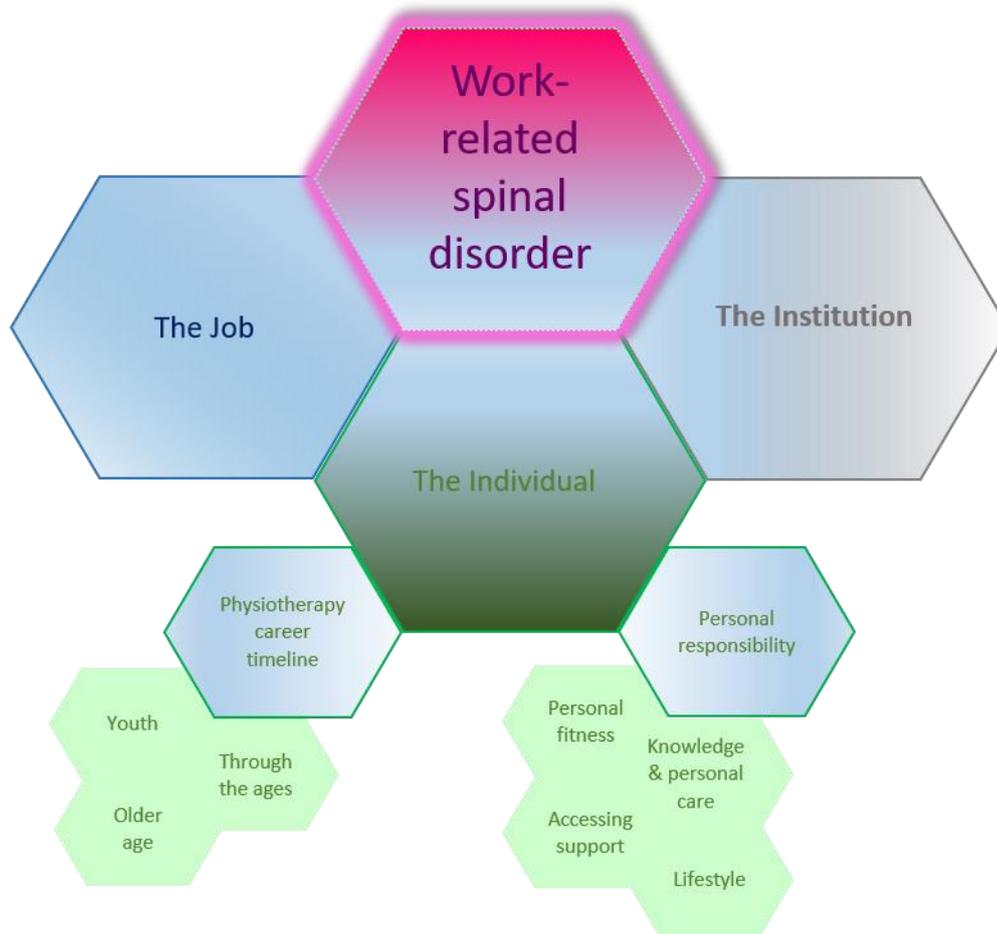


FIGURE 6: DIAGRAMMATIC REPRESENTATION OF THEME 3

The development of the themes as demonstrated via figures 4, 5 and 6, shows the increasingly complex and multi-factorial nature of contributing and risk reduction factors. Figure 7 shows a diagrammatic representation of the whole data set.

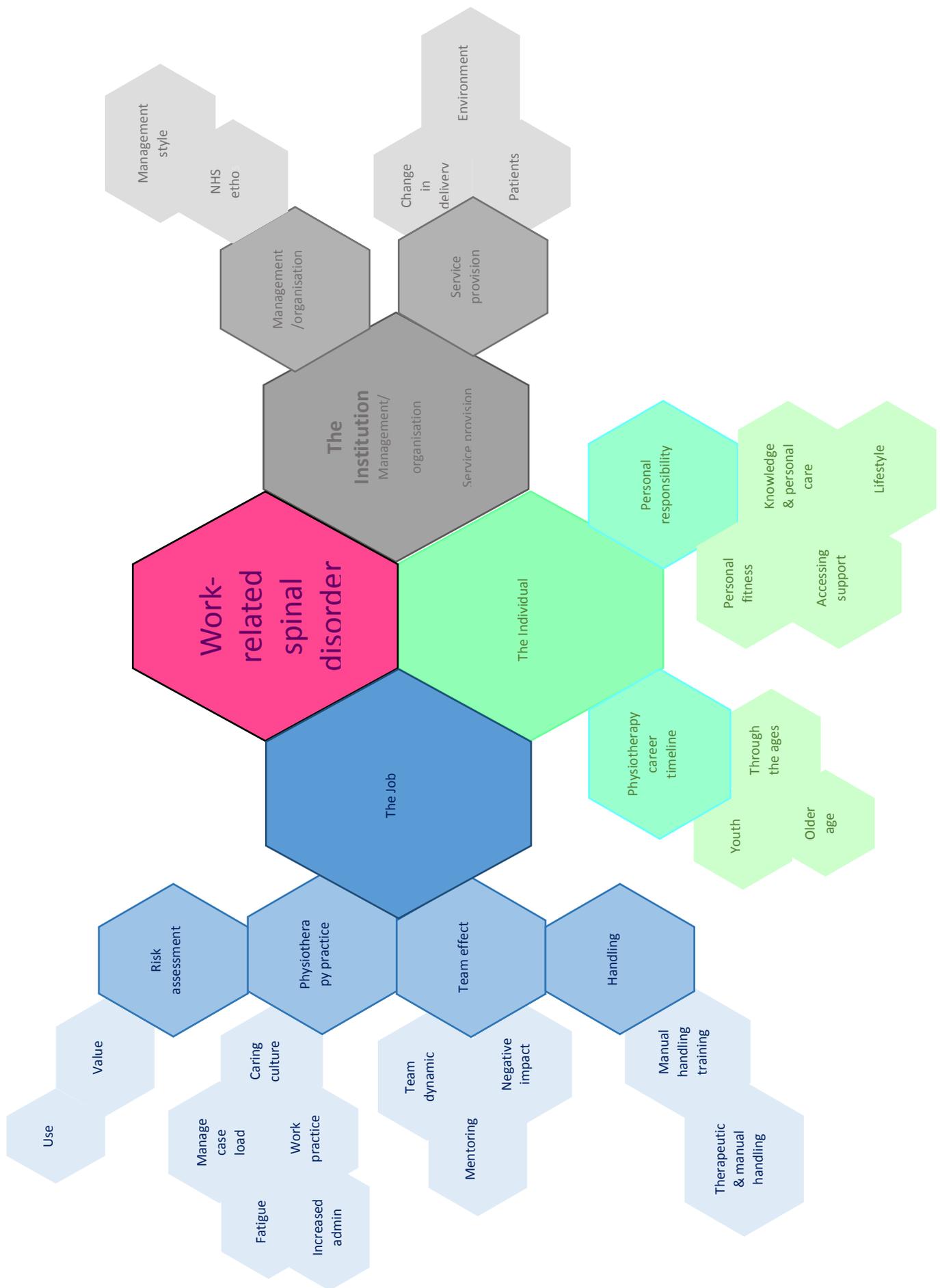


FIGURE 7: DIAGRAMMATIC REPRESENTATION OF WHOLE DATA SET

Figure 7 demonstrates the three themes, their factors and sub-factors and the use of the hexagonal shapes show the jigsaw piece components of the contributing and risk reduction factors. They show the relationship of the component parts in relation to the central premise of this study - work-related spinal disorders in the physiotherapy profession – reinforcing the recognition of the multifactorial nature.

5.3 Model based on the narrative evidence

Although figure 7 demonstrates the multi-factorial nature of the factors affecting WSD and acknowledges that the themes and factors are interrelated it is not able to demonstrate the extent of the interconnections. However, this representation of the whole data set (figure 7) was the basis of the evolution of a model based on the narrative evidence for the contributory and risk reduction factors for WSD within the physiotherapy profession. It was identified in the methods chapter (table 14) that although three distinct themes were identified each with recognised factors and sub-factors, the themes, and especially the factors, were inextricably interlinked and it was for this reason the themes, factors and sub-factors were represented in figures 4,5, 6 and 7 as linked hexagons. In exploring these interconnections and highlighting the different strengths of the interconnections a model based on the narrative evidence from the data evolved as represented in figure 8.

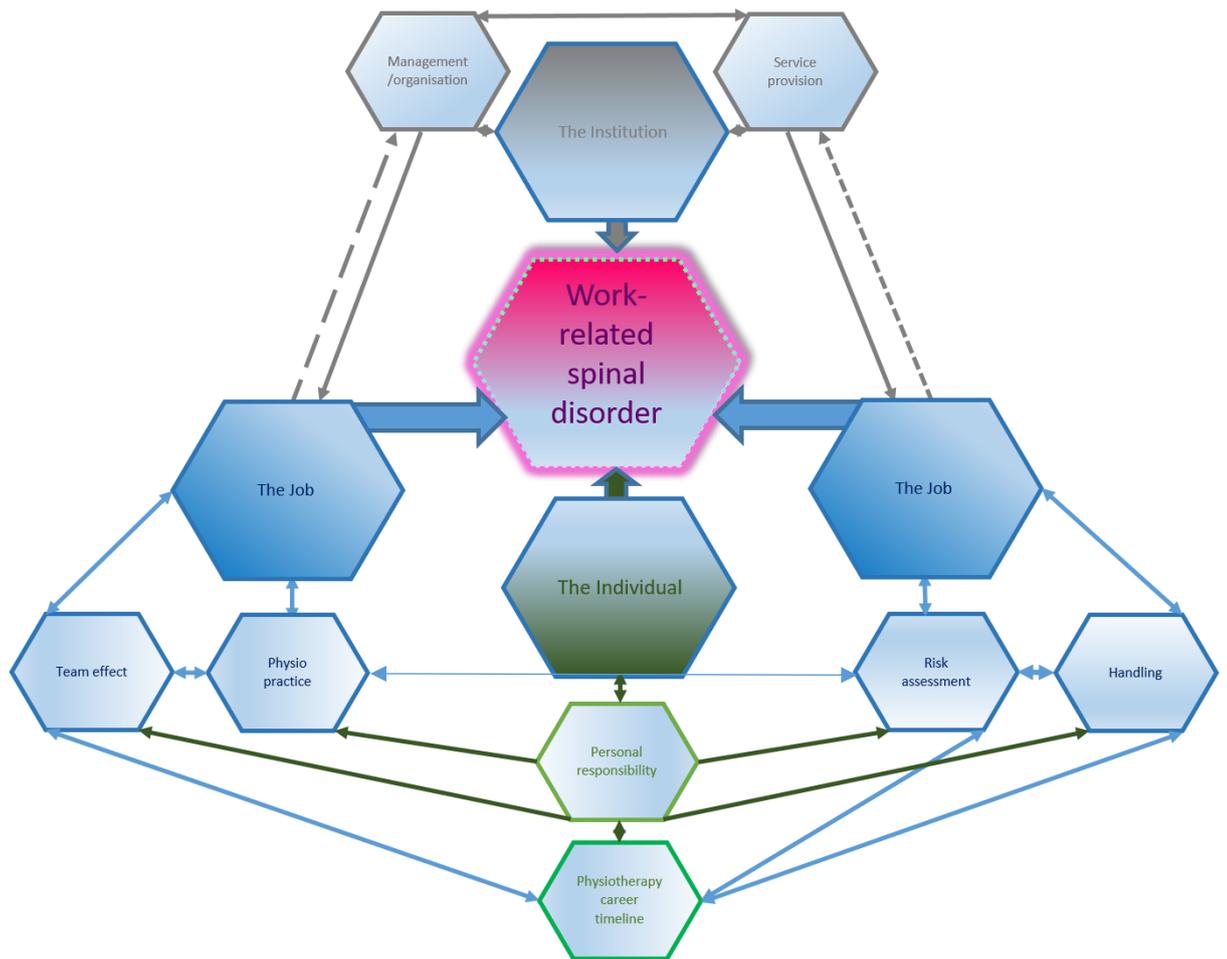


FIGURE 8: MODEL BASED ON THE NARRATIVE EVIDENCE OF CONTRIBUTORY AND RISK REDUCTION FACTORS FOR WORK-RELATED SPINAL DISORDERS IN THE PHYSIOTHERAPY PROFESSION

The model shows that there is a relationship between the factors of management/organisation and service provision and that the interactions are two-way as shown by the direction of the grey two-headed arrows. Both factors also demonstrate a two-way interrelation with the Institution which further interrelates directly to WSD as demonstrated by the thick block arrow. The one-way nature of this interaction suggests that there is a direct impact of the Institution and its factors on WSD.

The Job theme has been divided into two for the sake of the model to demonstrate the impacts of the component factors by siting risk assessment and handling together to emphasise their closeness to each other and their inherent interaction with each other. The double headed arrow linking the two

Job hexagons indicates that risk assessment and handling also relate to the other Job factors of physiotherapy practice and team effect. These four factors impact directly on WSD as highlighted by the blue block arrow. Other interactions with the Job theme come from the Institution theme though it can be noted that these interactions are uni-directional as indicated by the grey one-way headed arrows as the possibility of the impact is less when moving from the Job to the Institution. The management/organisation and service provision factors interact directly on the Job theme and thereby on to WSD. However, the Job can only partially interact with the management/organisation factors and thereby onto the Institution as represented by the broken lines. The width of the broken lines highlight that there is less impact from the Job on management/organisation than there is on the service provision factor. This suggests that physiotherapists feel that they have limited ability to impact factors within the Institution which impact on WSD.

The Individual theme impacts directly on WSD as represented by the green block arrow via the two factors of personal responsibility and the physiotherapists' career timeline which also have a two-way relationship with each other. The physiotherapists' career timeline factor also has a two-way relationship with all four factors within the Job theme. The personal responsibility factor however, has a one-way relationship with all four factors within the Job theme as this requires an individual's personal commitment.

This model represents the complexity of the factors and their inter-relations as they impact upon WSD in the physiotherapy profession and highlights that any intervention to increase the safe practice of physiotherapy, and to reduce the prevalence of WSD in physiotherapists, would need to be multi-factorial in approach requiring involvement of the whole range of contributors from the NHS as an institution to each individual physiotherapist.

5.4 Theory Development

This study has so far reached the first level of the framework (Figure 1, page 87) bounded context - by the creation of the diagrammatic representation of the whole data set (Figure 7, page 184). It has moved towards the interpretation level in its creation of the model based on the narrative evidence (Figure 8, page 186), where relationships between constructs (Gregor, 2006) have been recognised. The construction of a model based on the narrative evidence (Figure 8) for this study has followed the conventions for theory creation in general (Figure 1, page 87) (Urquhart et al, 2010), and in CGT specifically (Table 5 page 83) (Gregor 2006). To avoid Layder's (1998) criticism that GT produces micro-phenomena as a result of its coding style of bottom up, Urquhart (2013) suggests that the iterative and reflective nature of the coding process, which aims to be analytical and not just descriptive, must be recognised. Thus, theorising began at the coding stage in order to consider the meaning and interconnections of the codes that evolved, grouping the codes together, considering the names attributed to codes and whether they are truly representative of the data and considering the relationships between the codes. This analysis approach was supported by managing participant selection by theoretical sampling, the use of reflective and theoretical memos (Chapter 4, tables 9 and 10), and abstraction using an interpretive and cultural approach.

Gregor (2006) suggests that a theory model should have a small number of constructs and therefore a further depiction of Figure 8 for this study, with two main constructs and demonstrating relationships between them, is presented in diagram form in Figure 9.

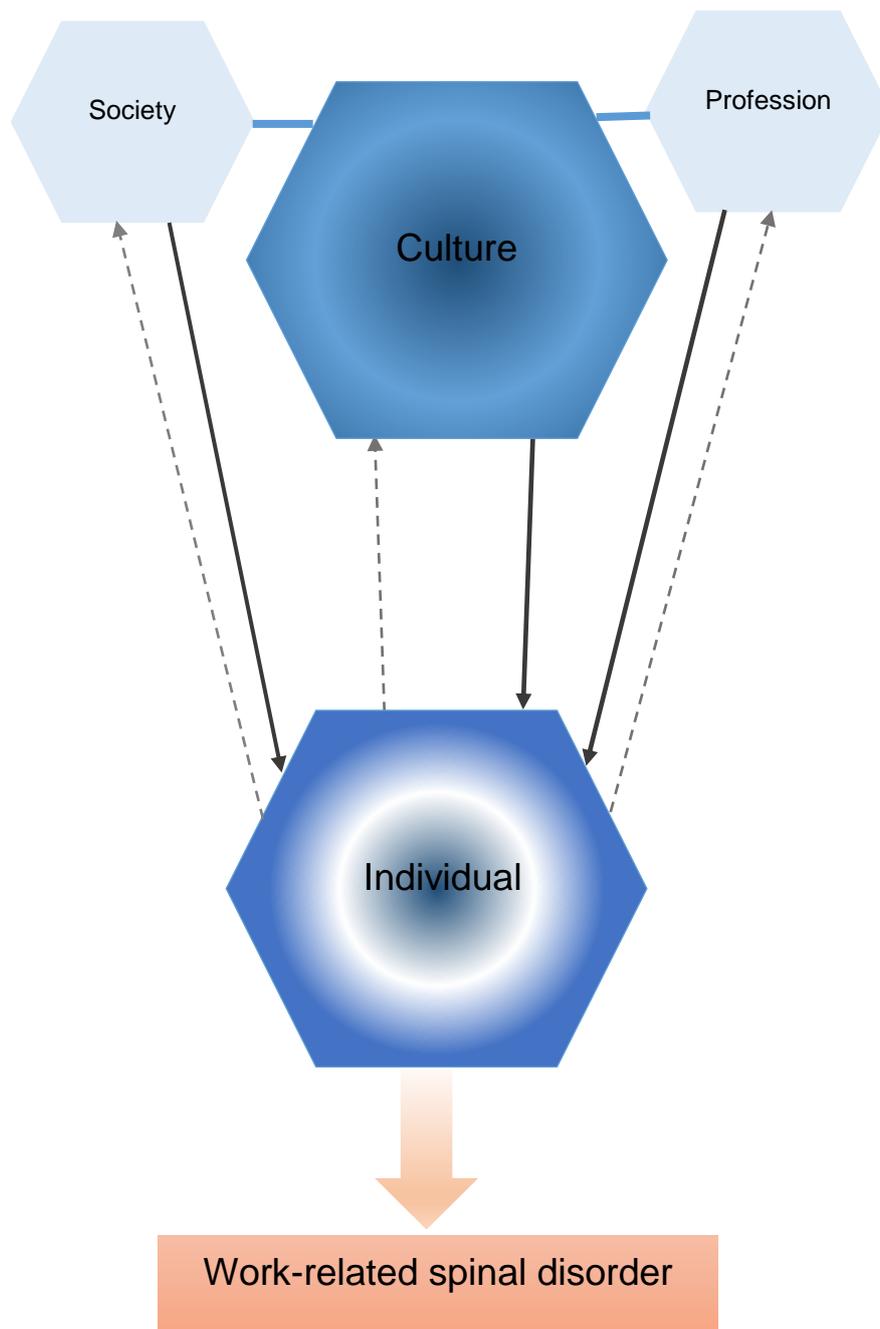


FIGURE 9: A SECOND DEPICTION OF A MODEL FOR CONTRIBUTORY AND RISK REDUCTION FACTORS FOR WORK-RELATED SPINAL DISORDERS

It is advised (Urquhart, 2013, Charmaz, 2006) that the core constructs of a theory should be defined to enhance comprehension of the theory and its modelling. Therefore in this model Culture is defined as the philosophy of the construct which is enriched by its ethos, values, principles and beliefs. Thus

the contributing elements to the cultural construct are professional culture, which is defined as the culture pertaining to a specialised, qualified expert in a given field (in this study physiotherapist) and by society culture which is defined as the culture pertaining to a wider community or shared collective (in this study physiotherapy, NHS, Wales and the UK).

The construct of Individual is defined as a particular person, who sits within the culture about which the theory alludes (in this study each single physiotherapist).

The relationships between the constructs also needs to be defined and thus the solid lined arrows demonstrate definite impact of one construct upon another and its strength and direction. The broken lined arrows demonstrate a lesser ability for the impact of one construct upon another whilst recording the direction of the impact.

Figures 8 and 9 represent a graphic illustration based on the narrative of the data and thus remain at the level between bounded context and substantive theory in the conceptualisation theory proposed by Urquhart et al. (2010) (Figure 1). The three themes – The institution (figure 4), the Job (figure 5) and the Individual (figure 6) – and their factors and sub-factors are represented in Table 14 and Figure 8, where the interactions are represented by double and single headed arrows, indicating the direction of the interactions, and by different levels of full and broken arrows, indicating the strength of the interactions. These representations describe the narrative of the data and to establish a theory further abstraction of the themes and factors is necessary. Urquhart (2013 p 193) defines substantive theory as being “... substantive in the sense that it pertains only to the phenomena being studied and makes no claims to generalise beyond that particular phenomena”. The phenomena of interest for this study was work-related spinal disorders in the physiotherapy profession in the NHS and thus the substantive theory for this study only pertains to those phenomena and does not claim to relate to other professions in other cultural situations. However, to raise the narrative model to a substantive theory further conceptualisation was required to create a small number of constructs that are abstract, and

grounded in the data, to represent a theory. As undertaken for the representation of the narrative based on the data following advice from Urquhart (2013) and Charmaz (2006) the core constructs of a theory should be defined to enhance comprehension of the theory and its modelling. Gregor (2006) whilst agreeing with Urquhart (2013) and Charmaz (2006) also identifies that a theory not only requires that its constructs are defined but that the relationship between them is recognised.

Therefore, further abstraction took place making sure that the abstraction remained rooted in the data, connections were considered and a graphic representation of a theory for the contributory and risk reduction factors for work-related spinal disorders in the physiotherapy profession was devised (Figure 10).

5.4.1 The Mixer Theory for Contributory and Risk Reduction Factors for Work-related Spinal Disorders in the Physiotherapy Profession

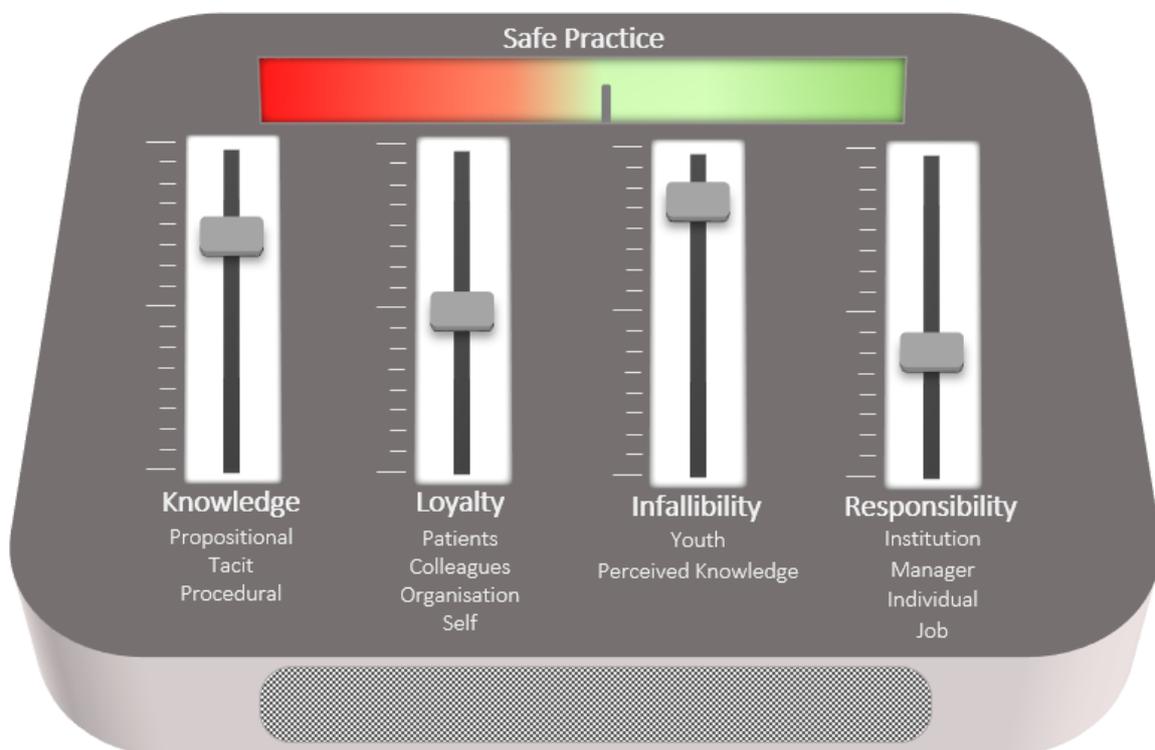


FIGURE 10: A MIXER THEORY FOR CONTRIBUTORY AND RISK REDUCTION FACTORS FOR WORK-RELATED SPINAL DISORDERS IN THE PHYSIOTHERAPY PROFESSION

The mixer deck analogy uses the concept of bass, treble, harmony etc to represent the core constructs of the theory, knowledge, loyalty, infallibility and responsibility, each with equal value in the production of a certain “sound” which in the theory is safe practice. The quality of the sound produced will be dependent upon the level of the component constructs and will be variable at any given time. Prior to abstraction for theory development the emphasis had been on the bounded context (Figure 1 Urquhart et al., 2010) of the study – that of work-related spinal disorders within the physiotherapy profession – and this had been considered the endpoint. The theory development from the narrative based on the narrative of the data allowed consideration of the data in a more abstract vision and resulted in the desired outcome of safe practice of physiotherapy rather than specifics of work-related spinal disorders within the profession. It was of note that definitions within the literature of safe practice within health care were related to the delivery of safe clinical practice for the benefit of the patient, and was not related to safe practice in terms of the clinician delivering the care. This emphasis supports some evidence within the data that the patient comes first and that the clinician is less considered – *“make a difference to the patient it's putting other people before yourself really (Dave, line187)*. Although the definition of safe practice accepted for this theory was derived for numerous work environments and is not specific to health care or physiotherapy it is suggested as a good working explanation for this study’s theory - Safe Work Practices and Safe Job Procedures are a means of mitigating hazards identified through the hazard identification, assessment and control process (H&S.gov, 2018). Once safe practice was embraced it was clear that there were levels of safe practice and that there are constructs, abstracted from the data, which impacted on increased or decreased safe practice. The constructs which emerged were Knowledge, Loyalty, Infallibility and Responsibility. Any number of perturbations of each, or all, of these constructs result in a level of safe practice at any one time, which would be individual to each physiotherapist, and which is reactive to change dependent upon changing circumstances and perturbations of the constructs. The individual physiotherapist will have variable influence over each of the constructs, as demonstrated by the arrows in Figure 8.

The construct of **Knowledge** abstracted from the data as knowledge underpins the practice of physiotherapy (CSP 2002) and is apparent in its different types throughout the data set. Propositional knowledge is defined as knowledge gathered via education (Theory of knowledge, 2018) and is discussed in the data in relation to undergraduate and postgraduate knowledge regarding the theoretical understanding of manual handling theory, risk assessment theory, anatomy, MSK conditions and their treatment – “ *I think the way they're [manual handling] trained now it's so black and white and specific that they are much more aware (Katie, line 308), “So actually there are lots of physios with back pain so knowing what to do doesn't stop you from getting it” (Louise, lines 151 - 152).* It was evident that despite acknowledging their acquisition of this knowledge which, especially in the case of undergraduate education, was recognised by participants as being invaluable to physiotherapy practice they did not, or were not always able, to implement it – “*Well, in theory, they are meant to be for every patient is risk assessed..... They are not used as thoroughly as they should be used “(Katie, 233 - 236).* Tacit knowledge is defined as knowledge acquired through life and difficult to teach another person (Theory of knowledge 2018). This was evident in the data in relation to comments on professional behaviour, the use, or not, of risk assessment and levels of clinical experience which were considered to be inherent in the reporting participant and about which they had not thought until prompted to do so by virtue of participation in the study – “*Informal risk assessments. I never do a formal risk assessment” (Margaret, line 300).* This lack of overt awareness of tacit knowledge, some of which may mitigate against increased risk to the individual, meant that it was not passed on as a valuable resource to other colleagues. Procedural knowledge is defined as knowledge acquired by doing (Theory of knowledge 2018) - *My neuro handling definitely isn't as good as the senior members of staff I was probably making quite hard work of it as well (Dianne, lines 408 - 412).* This type of knowledge is prevalent in physiotherapy as many physiotherapists tend towards kinaesthetic learning styles, and was apparent in the data in relation to comments on the application, rather than the theoretical knowledge, of manual handling and risk assessment application and the individual's clinical experience. Many comments referred to having

good theoretical (propositional) knowledge but a mixed ability to follow and/or implement good procedural knowledge with some restrictions being out of the individual's control – “... *I had no rest periods. Cos I had to be on the hoof constantly as we had so many patients. And so I think intensity of work load without adequate rest (Blodwen, lines 252 - 254)*. In view of the fact that the practice of physiotherapy is a predominantly practical procedure the limitations on ability to conduct procedure could have a high impact on the ability to have safe practice for the individual.

The construct of **Loyalty** which is defined as - a person who feels *loyalty* to a nation, cause, or person feels a sense of allegiance, commitment, dedication toward them (Vocabulary.com. 2018) - abstracted from the data which revealed loyalty to a number of entities as being an important component of professional physiotherapy practice. The most prevalent comments in relation to loyalty were those made in relation to the patient where it was apparent that the care, rehabilitation and safety of the patient was of paramount importance even to the detriment of the physiotherapist – “.....*to do best by the patient..... that was the driving force and that our own health probably came 2nd. . . . (Sarah, lines 156 - 158)*. Loyalty to colleagues was demonstrated through comments regarding team working, taking care of each others' work practices, the guilt felt if others need to cover workload and thus taking limited sickness absence and returning quickly to work if sickness absence was taken - “*I think because we work very closely as a team, and everybody knows the time pressures and the patient caseload we've got, you want to support your other team members (Mary, lines 225 - 226)*. There was an apparent loyalty of the organisation to the staff at a local level demonstrated through the comments made regarding the management style of staff to reduce risky exposure - *If it seems like a good idea [requests for equipment aimed at reducing risk], it's not enough, it has to be justifiedThe justification is staff need it to maintain their well-being (Peter, lines 115 - 118)*.

Counter to the local level the participants demonstrated a lower degree of loyalty to the NHS as a whole as they reported limited or no ability to influence strategy which may impact on them. Repeated comments were made regarding the individual's loyalty to themselves around issues such as

exercising to ensure fitness to work, the impact of their home life and life decisions and their use, or not, of the occupational health service - *“There is definitely an individual responsibility to looking after yourself, definitely”* (Stephen, lines 439 - 440). The construct of loyalty therefore has the potential to be either positive in reducing risk factors or negative in allowing some unsafe work practices.

The construct of **Infallibility** which is defined as - incapable of failing when used to describe human capacity for error (Vocabulary.com, 2018) – was abstracted as participants’ own infallibility was recognised across the data which could be divided into a number of aspects. The arrogance of youth was identified when comments were made regarding their strength to do all aspects of any physiotherapy practice. Youth was also identified as contributing to the perception and the belief that “it won’t happen to me” when discussing the possibility of developing a WSD – *“..... when you are younger you don't want to necessarily think about what you are doing. Because we don't think it will happen to us”* (Margaret, line 214). This perception decreased once something had happened to them, which was not dependent upon career duration or age but was dependent upon the acquisition of the WSD. Additionally there were numerous comments regarding the effect that their perceived knowledge regarding MSK conditions may have in protecting them from injury and in facilitating self- management suggesting that as they know about MSK conditions and how to treat them they are more likely to be immune – *“I think they assume that we know how to look after ourselves, especially because we're physiotherapists and we know all about backs* (Margaret, lines 203 - 204).

The construct of **Responsibility** which is defined as - the state or fact of being responsible, answerable, or accountable for something within one's power, control, or management (Vocabulary.com 2018) - was abstracted due to participants’ comments regarding the impact on physiotherapy practice of varying levels of personal responsibility. They perceived that in addition to their own responsibility to the job, to themselves and to the institution the institution and the managers had a responsibility towards them – *“I think*

there's then having the organisational support in terms of being a role that you feel supported in, you've got manager support (Lucy, lines 464 - 468).

However, it was evident that levels of responsibility were variable and were often beyond the control or influence of the individual physiotherapist or physiotherapy service which limited in their ability to practice autonomously. Some issues which influenced the lack or limited responsibility of either the individual or the service were recognised as patient numbers, patient types, workload, the environment and staffing levels which could lead to compromised professional autonomy – *“However, particularly in the current economic climate there are huge pressures on people to complete work whether it be within time frames and targets (Dick, lines 62 - 63).*

Compromised professional autonomy has the possibility of further reduction in responsibility in each individual potentially compromising safe work practice. Once again when considering the impact of the institution (the NHS), there was a perception that the individual had limited ability to influence the acceptable responsibility level offered by it to its employees. There was a perception that this directional power relationship, with limited ability for the individual to influence it, could lead to compromised safe practice.

In the theory graphic (Figure 10) the vertical slider mixers suggest the inter-related nature of the constructs and how one may influence another whilst still acknowledging that they are also separate issues. The effect of one, or any combination of the constructs have an end result of a good quality sound - of the ability to perform safe physiotherapy practice - and thus the theory suggests that any changes in any one or combination of the constructs can influence the level of safe physiotherapy practice “sound”. Manipulation of the sliders has the ability to alter the sound generated which represents different levels of safe physiotherapy practice. It is clear that physiotherapists’ perceptions are that the ability to work in as safe a personal way as possible is not simply just about themselves but that it is also about other issues. Further perceptions suggest that managing the perturbations of the constructs to establish as safe working practice as possible can only in part, be influenced by each individual or by the physiotherapy service. It is the ability, or lack of ability, to manipulate each of the constructs which can enhance or

inhibit safe working practice eg good tacit and procedural knowledge can mitigate harm whereas good propositional knowledge and poor procedural knowledge could increase the risk. There are an infinite number of perturbations of the constructs which puts each individual at a different level of risk at any one time, resulting in variable levels of safe practice.

At this stage the theory for this study has reached the substantive theory level of Urquhart et al's. (2010) conceptualisation theory (Figure 1). Glaser and Strauss (1967) in their objectivist approach to GT felt that substantive theory should be raised to formal theory and more recently Urquhart et al. (2010 (Figure 1) also identify that formal theory is a possibility for grounded theory study, though it need not be the final aim. To raise this substantive theory to a formal theory it is suggested that the constructs of the new theory should be transferable to other contexts, be related to literature appropriate to the new constructs and be compared to other theories in the field (Glaser and Strauss 1967, Charmaz, 2005, 2006, Neill 2006, Urquhart 2013). Thus to enable the substantive theory to reach a formal theory, further work, beyond the scope of this study, will be required for it to be transferable and tested in different contexts and so this substantive theory cannot be raised to the level of a formal theory at this stage. However, other aspects of assessing the quality of the theory can be implemented at the substantive theory level in preparation for the future work. As suggested, the findings of this study, and its "mixer" theory, will be discussed in relation to previous and new literature in the next chapter. Comparison of the mixer theory to other theories was explored to enhance this study's theory. However, although there are many examples of grounded theories in healthcare situations (Glaser and Strauss, 1965, Strauss et al., 1982, Andrews and Waterman, 2005, Laws et al., 2009, Lindgren et al., 2012, Clausen et al., 2017), following a post-theory literature search there appears to be minimal examples of grounded theory in relation to work-related musculoskeletal or spinal disorders within healthcare professions with Wiitavaara et al. (2007) considering the musculoskeletal problems encountered by nurses. Wiitavaara et al's. (2007) study concentrated on the concepts of health and of wellbeing and the "striving for balance theory" that was created by the study reflected little of what this study uncovered and it

was thus difficult to make any meaningful comparisons. Therefore, despite this study's mixer theory meeting all the criteria for grounded theory development (Table 5) consideration of other theories with a wider remit than healthcare and work-related musculoskeletal or spinal disorders was necessary. An integrated model of theories of work-related musculoskeletal disorders, which had been created from other theories across different workplace environments and populations (Karsh, 2006), was found and related to this study's theory.

Karsh (2006) felt that the numerous theories about the causation of work-related musculoskeletal disorders may be useful to those who wished to use ergonomic interventions to help control WMSDs. However, he identified that up to twelve theories have been proposed but they have not been compared to establish a useable theory for the assistance of ergonomic interventions. He therefore selected nine theories to compare, excluding those theories which considered only psychological factors. The nine were chosen as they were derived from a variety of work populations and environments and considered both biomechanical, behavioural and psychological factors. The chosen theories ranged in date from 1993 to 2001 and considered WMSDs including predominantly neck, shoulder and upper limb disorders and to a lesser extent low back disorders. In this respect the theories are not specific to spinal disorders as in this study, though this is comparable to much of the literature on the topic. It was exciting to note that each of the theories had components which were relatable to the data from which this study's mixer theory was created. Armstrong et al's. (1993) Dose Theory can be related to the comments on increasing work load and numbers of patients which were perceived to increase the risk of WSD. The Generic Factors identified by Hagberg et al. (1995) included posture, supervision and static positions all of which were identified by this study's participants as being perceived as affecting the risk of WSD in physiotherapists. Sauter and Swanson's (1996) Ecological Theory identified that work organisation factors and physical demands of the work directly and indirectly affected both physical and psychological strain which was also recognised in this study and was aimed to be mitigated through appropriate management strategies and practice

modification. In the Work-style Theory suggested by Feuerstein (1996) three behavioural mechanisms were highlighted including awkward postures and increased forces used, cognitive issues including feelings of lack of control of the job and physiological issues of increased muscle tension and static loading all of which were also recognised in this study. Carayon et al's. (1999) Job Stress Theory suggested the work organisation, the design of the job the work environment and technology were contributory factors to WMSDs which, once again, were all recognised as factors in this study. Kumar (2001) proposed four different theories Multi-variate Interaction Theory suggested multiple genetic, morphological, psychosocial and biomechanical factors interact on the musculoskeletal system of an individual which were also recognised to a greater or lesser degree by the participants in this study. The Differential Fatigue Theory suggested loading in work was variable and thus differential fatigue of different aspects of the musculoskeletal system occurred and that unless loading was changed to reduce fatigue it could cause WMSDs which was recognised in this study in aspects of the job of physiotherapy where altering loading was considered a means of reducing risk. The Cumulative Load theory suggested that repeated loading of tissue can lead to degradation of that tissue leading to WMSDs which physiotherapists in this study also recognised as they considered repetition of loading was an issue in physiotherapy practice. Kumar's (2001) fourth theory the Over-exertion Theory suggested that force, duration, posture and motion which exceeded the limits of the tissue could cause WMSDs which was recognised by the physiotherapists when related to the unexpected aspects of physiotherapy practice such as when a patient falls. In 2001 the National Research Council/Institute of Medicine model identified three interacting workplace factors, external loads, organisational factors and social context, could directly impact on development of WMSDs. It can be seen that there is overlap of many of the factors identified within the nine different theories despite different names allocated to the factors. Thus Karsh's (2006) comparison and combination of them all, from which he created an Integrated Model of the causes of WMSDs seems a reasonable approach to create an overarching, though not definitive, model.

The Integrated Model which Karsh (2006) created was complicated but he suggests that it reflects the evidenced or hypothesised relationships. Simply interpreted The Integrated Model identifies that workplace factors such as work organisation, the social/cultural context of the workplace and its environment can directly impact on physical and psychological work demands. These in turn can reciprocally impact on the individuals' characteristics which can cause physical and/or psychological strain or demand. These factors are then considered in their effect on physiological responses of tissues leading to pain and WMSDs.

It is immediately apparent from the discussion above that, despite the differences in nomenclature, there is considerable similarity between the factors identified in the Integrated Model of Karsh (2006) and those from the data supporting the theory for this study (Figure 8). If it is considered that the Integrated Model is valid as it was created from nine other theories the positive comparison to the narrative model for this study is favourable in giving credence and rigour to this study's mixer model.

However, there are obvious differences between the Integrated Model as per Karsh (2006) and the Mixer Theory as per this study which mean that the Mixer Theory moves theoretical thinking regarding WSD into uncharted territory. The most obvious difference is that the Mixer Theory of this study has been created out of data gathered from the perspective of physiotherapists who have experienced the phenomenon under study, that of WSD. No previous theory has considered this demographic group and therefore the Mixer Theory adds to understanding of factors affecting safe practice within the physiotherapy profession in the NHS. As the Mixer Theory is a substantive theory pertaining only to the physiotherapy profession it is unlike that of Karsh's (2006) Integrated Theory, which was developed out of other theories relating to different work environments and occupational groups. Additionally Karsh (2006) considered predominantly neck shoulder and upper limb disorders and to a lesser extent low back pain. The Mixer Theory concentrated on spinal pain exclusively and included cervical, thoracic and lumbar regions and therefore the Mixer Theory is specific to spinal disorders in the physiotherapy profession which has not previously been

studied. Furthermore, Karsh (2006) only considers causative factors whilst this study has explored factors which are positive in terms of risk reduction as well as causative factors. The Mixer Theory identifies that each of the core constructs of the theory, knowledge, loyalty, infallibility and responsibility, depending upon where on the slider scale they are could be either a contributor to WSD or could be used as a risk reducer. It is the interplay of the variability of the level of each construct which allows an infinite level of safe practice which can, to a greater or lesser extent, be managed by the individual and/or the service. Finally, Karsh's (2006) integrated model has been related to issues around symptomology and considers biology, physiology and pathophysiology whilst this study has considered broader aspects and has not narrowed the application to tissue or cellular level. The absence of consideration of this symptomology level leaves the Mixer Theory more likely to be able to be raised to a formal theory, by application to other contexts, and renders it a useful theory in considering levels of safe practice in physiotherapy and ultimately in other healthcare workers. The use of the Mixer Theory can be used to identify areas of work practice within physiotherapy which are beneficial to the individual and those which are detrimental and allow for the development and implementation of work practices which have a positive effect on safe practice based on sound theoretical evidence.

6 Discussion

This chapter considers the findings of this study in relation to the literature. Each theme will be presented and discussed with regard to previous literature and any new evidence that was not highlighted in the literature review (chapter 2) and linked to the study's substantive Mixer Theory. As the findings of the study were not pre-empted appropriate literature and evidence was incorporated into the discussion chapter in response to the emergent themes where necessary.

6.1 Demographic profile

Although a representative sample of a population is not necessary for a qualitative study it is, nevertheless, worthwhile considering the demographic profiles of the participants in the study.

There were twelve female and four male participants demonstrating a 25% male:75% female participant ratio which reflects the female dominated physiotherapy profession (HCPC, 2016). The study cohort reflects the male female discrepancy as identified by admissions into physiotherapy education at Cardiff University, which is the only physiotherapy education provider in Wales, at 24% male:76% female in 2014 and 23% male:77% female in 2016 (Cardiff University Admissions, 2016). The Chartered Society of Physiotherapy (CSP) (CSP, 2015), whilst acknowledging the male female divide, also identified that in the last decade there has been a steady increase in male applications to physiotherapy with a peak in 2014 entry at over 30%. The study cohort therefore was an accurate representation of gender within the profession at the time the study was conducted.

The age range of the participants was from 57 years to 24 years with five participants in their 20s, six in their 30s, two in their 40s and three in their 50s. Although there is apparently no evidence regarding age distribution within the profession this sample appears to reflect the workforce, as experienced within an NHS Health Board, with the majority in their 20s and 30s, demonstrating a tendency towards a younger workforce. As may be expected, the entry level Band 5 participants were the youngest group with ages from 24 years to 27 years. The apparently young workforce does not correspond to Katie's

perceptions of an ageing workforce which can be associated with comments regarding a lack of expectation of working until normal retirement age (Mary), though others (Dick, Clare) commented upon the increasing age of retirement which, in the future, will cause an increased percentage of older physiotherapists within the workforce. The Band 6 group showed an age distribution of 27 years to 39 years and the Band 7 group from 35 years to 57 years demonstrating that professional progression is not necessarily related to age or length of service. The generally higher ages of the Band 7 participants whilst reflecting professional promotion could also suggest that there is limited opportunity beyond Band 7, which remains a predominantly clinical role, as suggested by Katie who expressed concerns that there were limited opportunities beyond Band 7 which will impact on an ageing workforce. It has been identified that to remain in work a coping mechanism for physiotherapists with WSD was to re-deploy into a less physical or more managerial role within the profession (Molumphy et al., 1985, Scholey and Hair, 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, West and Gardner, 2001) with only a few who were required to leave the profession (Cromie et al., 2001). The two participants who were in managerial Band 8 roles were aged 47 and 59 which suggests that in this sample movement away from a clinical role into a managerial role was not age dependent. It was also clearly evident none of the participants were aged close to the current retirement age of 65, though two did represent the oldest physiotherapy staff within the Health Board suggesting that there is a discrepancy between the actual retirement age and the age at which physiotherapists actually leave the profession.

Participants qualified as early as 1978 and as late as 2012 and demonstrated a range of length of service as a physiotherapist between 3 and 36 years. The majority entered physiotherapy education direct from school thus qualifying aged between 21 years and 22 years. Two followed a prior qualification, one as a nurse and the other another degree, and then moved into physiotherapy qualifying aged 22 years and 24 years respectively. One followed a prior career and was aged 32 years on qualification as a physiotherapist and another commenced physiotherapy following administration/office work and

qualified aged 27 years. Despite those qualifying later in life all of the participants had experienced all, or the majority, of their working life within the physiotherapy profession. Prior to 1992, when physiotherapy education in the UK became an all degree entry programme, physiotherapy programmes followed a syllabus set by the Chartered Society of Physiotherapy (CSP) whilst subsequent to 1992 each university degree programme was individual though still accredited by the CSP (CSP, 2016). It was therefore probable that early physiotherapy educational experience of the participants would differ dependent upon date of entry and educational institution, with 3 following the CSP programme and being awarded a Diploma in Physiotherapy, and 13 studying a degree programme at various institutions. Although the Health and Safety at Work Act 1974 (HASAWA, 1974) was implemented prior to the commencement of physiotherapy education of all of the participants, the Manual Handling Operations Regulations 1992 (MHOR, 1992) were not implemented until after four participants (Sarah, Blodwen, Peter, Katie) commenced their physiotherapy education. The MHOR (1992) coincided with the date that physiotherapy became an all degree profession however, the teaching of manual handling across each accredited programme, whilst attaining the level for CSP accreditation, was unknown. Apocryphal evidence suggests that prior to the 1992 all-graduate education manual handling training was limited or absent during physiotherapy education and that manual handling learning occurred in the clinical situation based on the norms of the period. Although the only provider of physiotherapy education in Wales, Cardiff University, has consistently provided manual handling training at undergraduate level and, since its introduction in 2013, it has adhered to the manual handling ascribed nationally and all qualifying undergraduates attain the All Wales Manual Handling Passport (NHS Manual Handling Passport, 2003). The passport pertains to all healthcare workers within the NHS in Wales and makes no differentiation between professions, aiming to attain a consistent and replicable training for all.

The clinical areas in which each participant currently and previously worked was of interest as it has been identified that certain areas are more likely to cause WSD (Molumphy et al., 1985, Bork et al., 1996, Holder et al., 1999,

West and Gardner, 2001, Glover et al., 2005, Barnes et al., 2007). Clinical areas demonstrating high risk of WSD were rehabilitation and hospital based activities and it was for this reason that the study was placed in a NHS Health Board where these areas, and a broad spectrum of clinical areas, were provided. Without exception, all the participants commenced their clinical physiotherapy career by working through rotations across numerous clinical areas. The duration of the rotations depended on Band level lasting between 4 months for a Band 5 and up to 10 months for a Band 6. Following rotations participants became static in a chosen clinical area in which they then continued to develop. The impact on WSD of the rotational nature in the early career is discussed in section 5.2.3.1 where it is discussed in relation to the physiotherapists' career timeline. Two participants (Sarah, Blodwen) moved out of their chosen clinical area due to WSD, and two (Peter and Jackie) moved into management. Of the remaining 6 participants who had reached a static position all had remained in their chosen clinical area. The other 6 participants continued in rotational roles. A wide spectrum of physiotherapy practice was demonstrated within the study cohort, including those considered risky for WSD, and included musculoskeletal out-patients, rheumatology, neurology, stroke and medical rehabilitation, spinal injury rehabilitation, orthopaedics both elective and trauma, critical care and surgery, respiratory, neurological surgery, neurological psychology, paediatrics, occupational health and community based physiotherapy.

Although it was not the aim for the study to recruit a specific physiotherapy demographic the study's recruitment process did create a study population which represented a wide spectrum of the physiotherapy profession within one Health Board.

6.2 Theme 1 – The Institution

This study was set within the context of the National Health Service within the UK particularly a University Health Board in Wales. There has been very limited studies within the UK with only Scholey and Hair (1989) and Glover et al. (2005) concentrating on prevalence rates of WMSD and WSD and Graham and Gray (2005) considering the perceptions of newly qualified physiotherapists regarding WMSD. None of these three studies identified any

factors specifically relating to the NHS as an institution within which physiotherapy was practiced. Similarly studies conducted in other countries did not identify issues around the employing institution and although the practice of physiotherapy as a profession has similarities worldwide the differences in healthcare institutions and systems across countries makes information relating to this factor only relevant to the individual context. Therefore, the findings from this study in relation to the NHS in the UK as an institution, and the evolved factors relating to WSD are unique to date.

6.2.1 Management/Organisation

The current ethos of the NHS and the changes experienced over time, suggested by several who had been in NHS employment for up to thirty six years having experienced several NHS re-organisations, were demonstrated to impact negatively on WSD with many factors increasing the perceived risks. It is regularly reported in the UK media that the NHS is continuously under pressure and was described by the British Medical Association (BMA) as being “at breaking point” (Guardian, 2017) as it tries to accommodate the ever increasing demands of an increasing and ageing population and the expectations of the service users. The financial pressure under which the NHS functions and strategies adopted to provide a good and efficient service, including increasing community management of patients, reducing patient admittance to hospital and aiming towards a seven day service were perceived to be putting the physiotherapy staff under pressure resulting in increased risk of WSD. The participants of this study identified that they were required to adapt to the restrictions imposed by the NHS but felt they had only limited ability to influence the NHS’ decision making either now or into the future (Figure 6). It has recently been highlighted that physiotherapists should be involved in strategic NHS decisions moving into the future in England (Hitchcock 2017) and, despite the differences in the NHS between England and Wales, it is not unreasonable for that involvement to also be appropriate in Wales. The feeling an individual has regarding limited control they have over their own job is recognised as being, in itself, a factor increasing the risk of WMSD (Carayon et al., 1999, Devereux et al., 2002) which, when added to

the direct impact of NHS decision making on WSD highlights a perceived area of increased risk of WSD within physiotherapy not previously recognised.

It was identified that management style had a perceived impact on the risk of WSD. The type of impact on the perceived risk of WSD could be either positive where it was perceived that the management style was felt to be supportive, or negative where it was felt to be un-supportive. The perceived risk was similarly considered at whatever level (Band of physiotherapist) the management style was implemented. Supportive styles were considered to be an open and accessible two-way relationship. Several negative aspects were considered to be an abuse of authority, a reactive rather than a proactive or strategic management style and pragmatic micro-management within a team (see 6.5.2.2). Within physiotherapy a good workplace culture has been recognised as being beneficial generally (LAMPS, 2015, Allen, 2015) though it has not been related to WMSD or WSD specifically.

The relationship between management style and the perception of WMSDs, though not specifically WSD, has previously been recognised in numerous occupational settings (Carayon et al., 1999, Faragher et al., 2005, Hagberg, 1996). In these studies WSD was incorporated into the over-arching term of WMSD though it is not unreasonable to extrapolate the combined data to WSD specifically. Although the relationship between management style and the prevalence of WMSD is well established it has not previously been highlighted in relation to physiotherapists working within the NHS as identified by the findings from this study.

One proactive management strategy recognised as being used to reduce risk of WSD was the acceptance of a patient's un-met need (patients who require physiotherapy who do not receive physiotherapy) thereby reducing the immediate pressure on the physiotherapist. The reason usually given for the un-met need from participants in this study was a lack of staff to fulfil the physiotherapy service provision which is impacted upon by the number of aged, complex and/or obese or bariatric patients (see 5.2.2.1). The need for safe staffing levels has been understood by the CSP and they have actively campaigned nationally for this to be recognised including parliamentary

lobbying and membership debates at the Annual Representative Conference (Chartered Society of Physiotherapy, 2014 a, b and c). In March 2016 Wales became the first country in Europe and one of only a small number of countries worldwide, to legally instruct hospitals to calculate nurse staffing levels on acute medical and surgical wards. In March 2017 a consultation process was opened on a new bill, Nurse Staffing Levels (Wales) Act. Since prior to the development of this bill there has been active lobbying of the Welsh Government by the CSP's policy officer for Wales (Chartered Society of Physiotherapy, 2015a) who advised that consideration of safe staffing levels cannot apply only to nursing and should not be considered in isolation to other factors and that a wider remit for planning was required. This unilateral recognition of nursing over other healthcare provision has the potential to cause contention between the professions working together within the NHS and between different healthcare settings other than acute medical and surgical wards. Despite the prospect of causing dissent the bill does acknowledge the concept of lack of staffing of the NHS in Wales though, regrettably the concern is directed at patient care alone and no consideration of the impact of low staffing levels on the staff is considered.

6.2.2 Service provision

There was an interaction between management/organisation and the service provision where physiotherapists were expected to accommodate to the change in NHS which impacted upon aspects of the physiotherapists' work including the type of patient seen by physiotherapists and in which settings the patients were managed. The changes in manual handling training will be discussed in 6.3.3 though it was generally accepted in this study that the development of changes in handling and handling training had reduced the risk of WSD in physiotherapists over time. The use of technology within the NHS has been seen for years to offer an opportunity to both improve the patients' experience and reduce costs (Kings Fund, 2008) despite repeated evidence within the media of poorly implemented and thus expensive computer systems (Guardian, 2013). It has already been established (5.2.2.1) that an individual's loss of control of their work practices has a negative psychological impact which increases the risk of WMSD in a variety of work

situations (Carayon et al., 1999, Devereux et al., 2002). The impact of distancing the physiotherapist from control over their own practice through the use of computerised appointment booking systems, as identified within this study, has not previously been considered. The lack of control over their own diary not only increased negative psychological aspects of work, contributing to increased risk of WSD, but also resulted in inappropriate physical loading of the individual physiotherapist in relation to severity and type of patient leading to fatigue and subsequent increased risk of WSD.

Another factor which was felt to impact upon the service delivery of physiotherapy that could have a negative bearing on WSD was the perception of the changes in patients currently seen by physiotherapists. There was a perception that as a result of the NHS' ethos to increase community care and reduce admissions to acute hospitals those patients who were admitted were more complex in nature and the more straight forward patients remained within the community setting. The perceived outcome of this was that almost all patients admitted to an acute hospital would require the attention of physiotherapists whereas previously this had not been the case. The physiotherapists working in the ward environment identified increased demand on their time and resources due to almost all in-patients now requiring their intervention. The increased complexity of patients admitted often required the attention of two or even three physiotherapy staff to safely execute the rehabilitation. This style of working increased fatigue (see 5.2.2.1) and subsequently increased risk of WSD. The increased demands and complexity of the patients required increased use of hoists and standing equipment to enable rehabilitation with the inherent problems of equipment used as discussed in 6.3.3. These issues highlight the connection between the factors of service provision, physiotherapy practice and handling. In addition to the perceived increased complexity of in-patients there was a consensus that there was an increasing number of over-weight and bariatric patients. Evidence suggests that physiotherapy has been well recognised as being valuable in the rehabilitation of bariatric patients with respect to respiratory function (Forti et al., 2009, Barbalho-Moulim, 2011) and exercise (Livhits, 2012, Wiklund et al., 2011) and the CSP advocate the involvement of

physiotherapists in bariatric care (CSP, 2012, 2013). However, there have been no studies which have investigated the impact of treating and handling bariatric patients has on the physiotherapist, either physically or psychologically though the increased risk of all types of WMSDs, including WSD, which has been recognised in nursing. Choi and Brings, (2016) reviewed twenty two studies of nurses' activity with overweight and obese patients which recognised that the risk of WMSD increased with patient moving and handling activities. Although Choi and Bring's (2016) review referred to nurses the riskiest activities were identified as activities that physiotherapists undertake during rehabilitation and as such could be considered applicable. However, as this study identified perceptions of increased risk of WSD as a result of managing the increasing number of overweight, obese and bariatric patients within routine physiotherapy practice in the NHS, this provides unique evidence and a recognition that further research is required.

The environment in which the physiotherapists worked was considered in many cases to be detrimental to the ability to perform the job safely thus increasing the risk of WSD. As physiotherapy services have developed they have outgrown the facilities within the hospital both in an in-patient and an out-patient setting. It was felt that older hospital design is no longer suitable for the style of physiotherapy now delivered with the main issue being complaints of lack of space and cramped conditions. This is not a new phenomenon in physiotherapy as Cromie et al. (2001) developed guidelines for safe practice of physiotherapy in Victoria, Australia which included the suggestion that ergonomic guidelines for space, equipment, furniture and environment should be mandatorily incorporated when designing workspaces for physiotherapists. These types of guidelines cannot be implemented on building stock already in situ though would be valuable when designing new premises. However, it would appear that there are no such guidelines in the UK relating to NHS physiotherapy workspaces and therefore this study presents new evidence within the NHS in the UK. It remains an area of concern as it is apparent that new builds within the last five years in the UHB used in this study, demonstrate work-spaces specifically designed for

physiotherapy practice which are inappropriate for the safe delivery of physiotherapy care.

In summary this theme has identified evidence not previously recognised in relation to contributory and risk reduction factors for WSDs in the NHS within Wales in the UK. New issues were identified around the impact of the NHS as an employing institution and the limited ability for physiotherapists to feed forward concerns, the impact of the style of physiotherapy management, the loss of control of their own work practices due to computerised booking systems, the increasingly complex nature of patients especially bariatric patients and the environment in which the physiotherapy service is delivered. These issues were found within the data (chapter 5 section 5.2.1) which was further abstracted for the development of the Mixer Theory. They were incorporated into the constructs of Loyalty and its sub-constructs of patients, colleagues, the organisation and self, Responsibility and its sub-constructs of the institution, the manager, the individual and the job and Knowledge and its sub-constructs of propositional and tacit knowledge. The sub-construct of tacit knowledge and the construct of Infallibility do not present themselves in this theme.

6.3 Theme 2 – The Job

6.3.1 Physiotherapy practice

The participants in this study identified that the people who entered the profession were essentially people who cared about others, which led to the caring nature of physiotherapists and their desire to do the best for the patient. Their need to demonstrate these attributes meant that they behave in ways that put themselves at increased risk of WSD. There was also concern that there was a culture that the patient came first and that the physiotherapist came second thus increasing their risk of WSD as, once again, their behaviour to achieve this being detrimental to their own safety. This has previously been recognised by Cromie et al. (2002) in an Australian population of physiotherapists and they concluded that the cultural values of the physiotherapy profession make it difficult for physiotherapists to do their job in a way that minimizes the risks of WMSD and WSD. This study comes more than a decade after that of Cromie et al. (2002) and suggests that

despite the massive changes in healthcare during that period, the culture within physiotherapy has not fundamentally altered. Whilst it may appear laudable to put the patient before the physiotherapist this is inappropriate when the impact of WSD on the individual, the physiotherapy service delivery and the institution as a whole are considered.

As it is accepted that culture has an influence on aspects of physiotherapy practice in relation to WSD (Cromie et al., 2002) it was clearly identified in this study that there were physiotherapy practices which were detrimental to the risk of WSD. Static and awkward postures and repetition of activities were highlighted as being a threat to the risk of WSD which reflects previous studies (Molumphy et al., 1985, Scholey and Hair, 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, West and Gardner, 2001, Salik and Ozcan, 2004, Barnes et al., 2007, Adegoke et al., 2008, Vieira et al. 2015) and, as discussed in the literature review 2.2, although there were methodological issues with previous studies the overwhelming consensus was similar and is supported by this study which therefore offers nothing new on this topic. The physicality of the job is well recognised and the overloading of the physiotherapists' musculoskeletal system was examined by Truszczynska et al. (2016) in young physiotherapists in Poland using a survey methodology which was therefore unable to measure actual loading of the system. Although they suggested the study population was young physiotherapists the actual ages ranged from twenty five to thirty five years which, in the UK, could represent up to fourteen years of clinical practice. Nevertheless, Truszczynska et al. (2016) identified that there was a positive correlation between WMSDs, including WSD, and the number of years worked and the number of hours per week worked. However, this study highlighted that there appears to be a lack of knowledge regarding the job's physicality in students pre-entry to undergraduate study, and despite Truszczynska et al.'s (2016) study on young physiotherapists and Graham and Gray's (2005) investigations of the perceptions of newly qualified physiotherapists to WMSDs there is no previous evidence regarding undergraduate or pre-entry physiotherapists' understanding of the physicality required which suggests future study of this would be valuable to try to

highlight the physical nature of the physiotherapists' role within healthcare as early as possible in an individuals' career.

The physicality of the job was recognised by many participants as leading to fatigue which they perceived increased the risk of WSD. This has been recognised in other healthcare workers and Gardner (2016) carried out a systematic review which, although it concentrated on nursing also included radiography, laboratory technicians and surgical theatre staff but did not include any studies on physiotherapy. Although the impact of shift work was a main contributor to fatigue in the review the physical nature of the work in nursing and surgical theatre was also identified as a factor (Gardner 2016). It was identified in the review that fatigue could mean that health care workers who are fatigued may not have the capacity to determine whether they are able to work safely. This lack of self-awareness due to fatigue is clearly of concern as it increases the potential risk of work-related injury, and applies to physiotherapists as well as the other professions included in the review and study of fatigue in physiotherapists could be beneficial as this study newly identifies that fatigue is perceived to increase the risk of WSD in physiotherapists.

In contrast to the physicality of the work being perceived as a risk factor for WSD this study identified that the increased administration duties, including as an example paperwork for discharge planning and patient note and record keeping, which physiotherapists were required to do put them at increased risk of WSD. It is possible that the reason for this being a contributory factor could be linked to the static postures identified previously in this section, however, the perceived reasons were also considered to be around the lack of, or inappropriateness of facilities in which to perform these activities and thus also links the increased administrative activities to the environmental factor previously discussed (see 6.2.2). Tuckett (2016) wrote in a physiotherapy publication about whether this increase in paperwork is needed and suggests it is related to gathering evidence in case of litigation rather than for patient or staff benefit. However, he wrote about nursing's increase in administrative activities and not about physiotherapy. The increased

administrative activities, and their impact, do not appear to have been recognised in physiotherapy and would benefit from further investigation.

A method of mitigating risk was identified as being modification of practice either to reduce the risk factors for WSD or in response to a WSD. This management strategy has been widely recognised (Molumphy et al., 1985, Scholey and Hair, 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, West and Gardner, 2001, Salik and Ozcan, 2004, Barnes et al., 2007, Adegoke et al., 2008, Vieira et al., 2015) and thus the findings from this study reflect previous evidence. The use of this as a management strategy for reducing risk of WSD remains constant after more than thirty years of evidence which suggests that it is either effective or that other risk reduction strategies are less effective or more difficult to implement. However, its use might cause some physiotherapists potential psychological stress when considered alongside the caring culture of physiotherapy previously discussed in this section and therefore would warrant further consideration to establish its appropriateness as a risk reduction strategy. This study did highlight a further strategy which was used in conjunction with practice modification which involved a more inclusive approach to caseload management. In this strategy the decision making regarding workload was a joint decision and was not left as the responsibility of the individual absolving personal responsibility and potentially injecting a more objective assessment of a situation. This approach could reduce psychological impacts on individual physiotherapists when making decisions about prioritisation of patient care and identification of patient's un-met need within a stretched physiotherapy service.

6.3.2 Team effect

Team working within healthcare is well established and much of the literature around the topic identifies both positive and negative impacts of this process thus the findings from this study support previous evidence (West, 1999, Baxter et al., 2008, Finn et al., 2010). Team working in healthcare is generally considered in relation to ward based or community based patient management and the studies (West, 1999, Baxter et al., 2008, Finn et al., 2010) reflect this for their study populations. It was previously identified (Chapter 5 section 5.2.2.2) that in this study the discussions around team

working were exclusive to the ward and community based physiotherapists and no one working in an out-patient situation mentioned this as a factor in relation to WSD thus, inadvertently reflecting the previous study populations' findings (West, 1999, Baxter et al., 2008, Finn et al., 2010). In these studies the investigations were of multidisciplinary teams, which is a common practice within healthcare, but which does not reflect the perceptions mentioned in this study where all comments on team working in relation to WSD solely related to the physiotherapy team. This could suggest a positive physiotherapy team identity which will either help in reducing risk of WSD or cause feelings of guilt to other team members thus potentially increasing the risk of WSD (see chapter 5 section 5.2.2.2). Alternatively it suggests an insular team who are self-reliant which was implied when it was identified that micro-management within the team as previously discussed (see 6.2.1) could potentially lead to increased risks of WSD. Finn et al. (2010) suggest that an unintended outcome of multidisciplinary team working in healthcare was to highlight the very occupational divisions it was designed to reduce, resulting in the multidisciplinary team being ignored as irrelevant when compared to more attractive forms of collective identity such as the uni-professional physiotherapy team. Study of physiotherapy teams has not apparently occurred as those studies which indicate that they are concerned with therapists' views are actually related to the therapists' perceptions of working within a multidisciplinary team rather than a uni-professional team (Suddick and De Souza, 2006 and 2007). Although these studies support the premises of the positive and negative impacts of team working reflected in this study, they do not address the physiotherapy team and therefore further study would be beneficial in this area.

A strategy for reducing risk of WSD was frequently identified to be mentoring for handling and risk assessment, of junior staff. Mentoring is a well-established practice and is routinely implemented within physiotherapy as a method of staff development. Mentoring is usually used in relation to improving clinical reasoning, clinical expertise and patient care, patient experience and outcome rather than safe physiotherapy practice as evidenced by a study which was being carried out within the Health Board at

the time of this study (Williams et al., 2014). It is recognised that those most susceptible to WSD are physiotherapists within their first five years of graduation (Glover et al., 2005, Vieira et al., 2016) and this was reflected in the comments from this study, as only top down mentoring of staff was suggested by the participants. As all staff undergo the same mandatory manual handling training, and are thus equally exposed to the most up-to-date training and knowledge, there should be no barriers to intra-level mentoring though there was no suggestion of this style of mentoring as a risk reduction method by any participants. The top-down approach may be perceived by some physiotherapists to be hierarchical and engender anxiety and distrust potentially limiting the possible positive impact of mentoring. Mentoring specifically for handling, risk assessment and safe practice, especially if completed using an all-round process of all Bands would be beneficial in reducing the risks of WSD.

6.3.3 Handling

The comprehended physicality of the job (see 6.3.1) is further acknowledged within this factor of handling linking physiotherapy practice and handling factors. From the perspective of the participants in this study there was a perceived difference between their understanding of manual handling and therapeutic or treatment/rehabilitation handling. If the description of manual handling as described in chapter 2 is acknowledged then any manual or physical activity performed by physiotherapists during their professional practice must be considered as manual handling. As such, any physical or manual activity involved in, whether directly or indirectly, patient rehabilitation must therefore be compliant with the professional and legislative measures in place to address the potential factors for safe practice of physiotherapy. This may be considered by some physiotherapists to be inconsistent with their role of rehabilitation experts as they perceive therapeutic or treatment/rehabilitation handling to sit outside of manual handling and thus the legislation that governs it. It was apparent from the participants of this study that they perceived their role as a physiotherapist who performs therapeutic handling, to be different from any other healthcare professional whose role was caring and not necessarily rehabilitation, as setting them

apart from other professions. This professional identification was also recognised in the team working factor (see 6.3.2) where the commitment to physiotherapy, rather than the multi-disciplinary team was construed as potentially detrimental to their risk of WSD. The need to re-iterate the position of therapeutic handling within the over-arching manual handling terminology must continue to be addressed to ensure comprehension of the legislative responsibilities of individual physiotherapists.

The perceived value and relevance of the mandatory manual handling training with which all healthcare workers in Wales were required to comply (WAG, 2003) provided both positive and negative perceptions in relation to its impact on risks of WSD. Several systematic reviews have been conducted investigating the impact and value of intervention strategies to reduce the risks of WMSDs (Amick et al., 2006, Hignett, 2003a) or low back pain (Dawson et al., 2007, Martino et al., 2008) which provide ambiguous and conflicting findings. Dawson et al.'s (2007) review included nursing studies only whilst Hignett (2003a) and Amick et al. (2006) reviewed predominantly nursing literature though included studies on other healthcare workers whilst Martino et al. (2006) included predominantly nursing literature though two studies from postal working were also reviewed. The studies included in the reviews involved a variety of interventions including manual handling task training and physical exercise programmes. All of the systematic reviews were extensive, comprehensive and well executed using appropriate literature search strategies and multiple reviewers. Each systematic review encountered difficulties in finding adequate numbers of high quality studies and were required to include studies considered of medium or even poor quality to enable an adequate number to be included in the review. Amick et al.'s (2006) findings suggested there was moderate level evidence for multi-component patient handling interventions and physical exercise interventions. Dawson et al. (2007) concluded that there was no strong evidence for the efficacy of any interventions though there was moderate level evidence that manual handling training in isolation is not effective and that multidimensional interventions are effective in preventing back pain and injury in nurses. There was ambiguous and conflicting evidence regarding the efficacy of exercise

interventions and the provision of manual handling equipment and training. Hignett (2003) found there was strong evidence that interventions predominantly based on technique training have no impact on working practices or injury rates. Martino et al. (2008) found no evidence that training with or without lifting equipment is effective in the prevention of back pain or consequent disability. The conflicting and ambiguous findings suggests there was no consensus regarding the impact or value of interventions aimed at reducing WMSD or low back pain in either nurses or other healthcare workers. It was not possible to isolate any studies included in the reviews which were based on physiotherapy and therefore the breadth of the reviews limited the application of the findings to the effect of manual handling training or physical exercise programmes in physiotherapy practice.

Lack of manual handling training was considered to be very low in the job risk factors contributing to low back pain in physiotherapists (Glover, 2005) suggesting that they were satisfied with the training and with its ability to reduce the risk of WSD. However, this study showed that the attitude towards manual handling training was also considered to be negative due to the perceived importance and relevance of the training. Kneasey et al. (2012) investigated the views of undergraduate student nurses and physiotherapists regarding their education in patient handling using a questionnaire survey with undergraduate nursing and physiotherapy students at one university in the UK. They demonstrated that most students agreed that university teaching about moving and handling prepared them for clinical practice However, almost half admitted undertaking unsafe moving and handling activities as they wanted to "fit into" the team rather than challenge unsafe practice. University-based education in safe patient handling, though important, can be undermined by workplace settings where unsafe practices occur which reflects some of the negative factors discussed around the impact of the team factor (see 6.3.2). Although Keansey et al.'s (2012) study involved undergraduate physiotherapists there is the possibility that similar reactions could be occurring in the lower Bands of qualified physiotherapists where standard practice encountered in the workplace conflicts with the mandatory manual handling training. Although this has not been investigated it could

result in undermining the perception of the value of the training potentially leading to an increased risk of WSD.

The findings of the reviews, Martino et al.'s (2008) suggestion that either the suggested techniques did not reduce the risk of back injury or training did not lead to adequate change in lifting and handling techniques, the perceived value of the mandatory manual handling training together with the lack of evidence regarding the physiotherapy profession specifically suggest that the participants were not working within an evidence based practice which contributed to the influences on their attitude towards the mandatory manual handling training they are exposed to. The impact and relevance of the mandatory manual handling training (WAG, 2003) and its ability to influence handling practices or to change culture requires investigation.

The mandatory manual handling training (WAG, 2003) with which the participants must comply was perceived to be related, primarily, to teaching regarding the use and application of mechanical equipment, including hoists and standing aids, designed to reduce the physicality of the rehabilitation of the patient for the physiotherapist and therefore to reduce the risks of WSD, rather than any education on rehabilitation handling. They perceived that there were issues which impacted on their ability to use the equipment including the additional time that it took and its' unavailability. They perceived that, at times using the equipment was, in itself, detrimental to the risk of WSD due to the manoeuvring of it about the environment and working with it in cramped places which were not designed to incorporate equipment commonly used today especially the equipment specifically designed for use with bariatric patients. Therefore the factors associated with using equipment were perceived to achieve their aim of reducing risks of WSD in some situations though in others they were perceived to increase the risks of WSD. A study by Ruszala and Musa (2005) appears to support these perceptions as they reported that the time duration of a patient sit-to-stand activity by physiotherapists, using four different mechanical aids, varied significantly between equipment types from nearly four minutes to one minute. They also identified that the chair lifter and the walking harness were found to result in a high risk of musculoskeletal injury for the physiotherapist and suggested further studies are indicated on physiotherapists' posture in the use of

mechanical aids. Gallagher et al. (2006) studied the availability in Ireland, of sliding sheets used by nurses to move patients and discovered that only 88% of respondents had access to sliding sheets of whom only 81% actually used them. This supports the perception that equipment is not always available and can suggest that even if it is available it is not used. In relation to the posture adopted by the physiotherapist whilst using a mechanical aid it was identified by Sparkes (2000) from a systematic review that neither the outcome of a pivot patient transfer or mechanical assistance patient transfer had been adequately researched in light of the MHOR (1992) regulations and suggested a need for further study of these subjects. This study (Sparkes, 2000) is now out of date as the handling measured is no longer in use as a result of the implementation of MHOR (1992) however, the suggested work required on the impact of mechanically assisted handling in physiotherapy does not appear to have materialised. Studies that have occurred concern the use and impact of mechanical aids in nurses and thus this remains an area which is under researched in the physiotherapy profession.

Manual handling is an integral part of physiotherapy practice and this study has exposed that its impact upon the practicing physiotherapists is inadequately understood and further research is required to increase the safety of this part of physiotherapy practice.

6.3.4 Risk assessment

Amick et al. (2006) stated that single activity manual handling training, concentrating on task oriented training does not work in reducing the risks of injury or changing the culture towards handling activities. Hignett (2003a) agreed with Amick et al. (2006) and suggested that multi factorial training including risk assessment as well as task training could have more of an impact. Following the introduction of the Manual Handling Operating Regulations (MHOR, 1992) the Chartered Society of Physiotherapy recognised the use of risk assessment should be incorporated into all aspects of physiotherapy practice and should become an embedded component of profession practice (CSP, 2008a). There is continuous exposure to the need and value of risk assessment in relation to healthcare through easily accessible national sites including the Health and Safety Executive (HSE

2016) and the National Health Service nationally (NHS 2016). In Wales the NHS (NHS Wales, 2016) specified that there should be a positive risk management culture to support staff and improve good patient care. To address this the All Wales Manual Handling Passport mandatory training incorporates a multi-approach to training based on risk assessment (WAG 2003). Despite the overt awareness of the value of risk assessment this study identified that risk assessment was sporadically and inconsistently implemented and, when it was implemented, it was often informal. This reflects Kneansey et al. (2012) where it was identified that more than fifty percent of the undergraduate nursing and physiotherapy students never experienced a formal risk assessment during their clinical based learning placements. Kneansey et al. (2012), CSP (2008a) and WAG (2003) all identify that risk assessment should be recorded. Physiotherapists' engagement with risk assessment could be linked with their perception of the value of the manual handling training as discussed above or with their perception of their own knowledge (6.4.2). However, the current limited engagement with risk assessment potentially increases the risk of WSD and further study of the lack of perceived value and engagement in risk assessment is necessary.

These issues were found within the data (chapter 5 section 5.2.2) which were further abstracted for the development of the Mixer Theory. They were incorporated into the constructs of Loyalty and its sub-constructs of patients, colleagues and self, Responsibility and all of its sub-constructs of the institution, the manager, the individual and the job and Knowledge and all of its sub-constructs of propositional, tacit and procedural knowledge and the construct of Infallibility and its sub-construct of perceived knowledge. The sub-construct of the organisation in the Loyalty construct and the sub-construct of youth in the construct of Infallibility do not present themselves in this theme.

6.4 Theme 3 – The Individual

6.4.1 Physiotherapists' career timeline

It has been well documented that early career physiotherapists, in their first five years, are the most likely to develop a WMSD (Molumphy et al., 1985,

Scholey and Hair, 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, West and Gardner, 2001, Glover et al., 2005) though there is little conjecture or evidence regarding why this might be. This study recognises the perceptions that early career behaviour negatively influences the risk of WSD as they perceive themselves to be strong and infallible due to their youth and consequently ignored potentially risky situations in favour of the perception of “it won’t happen to me”. This attitude was also identified by Cromie et al. (2002) and Graham and Gray (2005) more than a decade ago and despite undergraduate manual handling training this is a perception which does not appear to have changed in the, almost, thirty years which separated the oldest and youngest participants who identified this issue. This is of concern and further education at undergraduate and early career level must be considered.

Early career physiotherapists felt that their lack of experience meant that they were less aware of risks and put themselves in risky situations which would not occur once experience had been gained. However, this study also recognised that the effect of a team in which they worked had the potential to either positively or adversely influence practice in early career physiotherapists (see 6.3.2) depending on leadership and dynamics. This was supported by Kneasey et al. (2012) when undergraduate student nurses and physiotherapists were prepared to undertake unsafe moving and handling activities as they desired to ‘fit into’ the team rather than challenge unsafe practice. This detrimental practice can be linked to the effect of a team (see 6.3.2) and the management style (see 6.2.1) but also recognises that it could be linked to the caring nature of physiotherapists who put the patient before their own safety (see 6.3.1). However detrimental it is it must be recognised that this risk taking behaviour reflects what occurs in physiotherapy practice within the NHS (Graham and Gray, 2005) but, nevertheless, it warrants further investigation to identify strategies to reduce the impact.

During their early career physiotherapists in the NHS routinely work in a rotational capacity requiring them to move from one clinical speciality to another every few months. This study identified the perception that this increases their risk of WSD and, although there is no evidence, it is not

unreasonable to assume that at each rotation stage the physiotherapist returns to a low level of experience, having built up experience during their previous months on a different rotation, which renders them susceptible to WSD particularly at the beginning of each new rotation.

Despite their inexperience early career physiotherapists do employ strategies to reduce the risk of WMSD as identified in a study by Potter and Jones (2006). Although this study referred to final year undergraduates moving into work in private practice in Australia there is the possibility of extrapolating the findings to physiotherapists in the NHS in UK as they showed that the undergraduate physiotherapists tended to use self-management strategies to reduce risks which reflected some of the factors identified in this study including caseload management, arranging a mixed caseload, use of mentoring and maintaining physical fitness.

This study identified that there were both positive and negative aspects as the early career physiotherapists moved through their careers. They recognised that their earlier behaviour has increased their risk of WSD and adapted their behaviour accordingly. They also identified that their increased experience allowed them to practice in a less risky fashion and although there is no evidence of this King et al. (2009) recognised that there are differences in management strategies between older and younger physiotherapists and occupational therapists in the USA. Although the older and younger therapist showed similar WMSDs, caused by similar factors, the older therapists were more likely to report any incident and much more likely to take time away from work to recover than younger therapists.

The ageing of the workforce, and the increased retirement age was a concern for many in this study which is not exclusive to physiotherapy. The concerns centred round the inability to maintain the physicality of the work as they approached an older age. Squadroni and Barbini (2005), in their comprehensive mixed-method study, identified that many of the factors recognised in this study contributed to WMSDs in their population of physiotherapists working in Italy. The type of patient admitted to hospital had become more complex and demanded higher physiotherapy input and lack of

staff increased the time pressures on those who were delivering the service resulting in inability to take breaks. The older physiotherapists in the population were less able to cope with these conditions as observed by the ergonomic job analysis observed over three months. Despite these restrictions the older physiotherapists showed a reluctance to move out of their clinical field as a strategy to reduce their risks. This reluctance to change a clinical area was also evidenced by Molumphy et al. (1985), Scholey and Hair (1989), Bork et al.(1996), Holder et al. (1999), Cromie et al. (2000) and King et al.(2009). This study identified that currently there was not a high percentage of older physiotherapists within the workforce because the higher retirement age has not, as yet, had its impact. As the percentage of older physiotherapists within the workforce increases their management strategy options might be more limited and movement away from a clinical role or to a different clinical situation may become a strategy open to older physiotherapists. However, this may remain a distasteful option for some and, as identified by this study, the opportunities open to older physiotherapists as their numbers increase may diminish. The options of early retirement or retirement on health grounds, could have psychological impacts on the retiree as well as financial implications for the individual and the NHS. A strategic plan for the management of older healthcare workers in the NHS needs consideration at a national level.

6.4.2 Personal responsibility

This factor was identified within the study and covered a number of aspects that have not previously been considered in relation to physiotherapists. There was an assumption that pre-entry potential physiotherapy students were fit and healthy and were more active than the general population. Although there is no definitive evidence of this Kamwendo (2000) did identify that, in Sweden physiotherapy students were significantly more active than occupational therapy students or nursing students in their first term. It is not clear whether this fitness continues as the career progresses though personal fitness, as a strategy for reducing the risk of WMSDs was recognised by several studies (Amick et al., 2006, Dawson et al., 2007, Campo and Darragh 2010, Darragh et al., 2012, Gardener, 2016) and the implementation of

workplace physical activity was suggested as a strategy to improve physiotherapists' risk of incurring a WSD. The CSP also recognised the value for staff fitness for physical activity (CSP, 2013a) though they discussed the role of physiotherapists as the provider rather than the recipient of such a programme. This perception of physiotherapists being the provider not the recipient was also recognised when the NHS in England implemented a programme to cut the billions of pounds spent on sickness payments (Hitchcock, 2015). Physiotherapists were central to the delivery of musculoskeletal health checks and exercise programmes for other healthcare workers which reinforces theirs' and others' perception that physiotherapists' knowledge exempt them from WMSDs and WSD.

It would be appropriate to implement such a physical activity strategy within the Health Board and assess the outcomes following the successful example of a Health Trust in London (Millett, 2016).

The perception of the CSP of physiotherapists as the providers of these strategies can be related to the perceptions recognised in this study that physiotherapists' knowledge can mitigate against WSD though clearly the results of prevalence studies dispels this. The informal self or colleague led treatment, once WSD is established in an individual, is well recognised by previous studies (Molumphy et al., 1985, Scholey and Hair, 1989, Bork et al., 1996, Holder et al., 1999, Cromie et al., 2000, Rugelj, 2003, Salik and Ozcan, 2004, Glover et al., 2005, Barnes et al., 2007, Adegoke et al., 2008) reinforces the belief that their knowledge is adequate to manage the problem without seeking further assistance leading to the development of an invisible problem making it harder for it to be addressed officially. If physiotherapists do seek assistance in the management of their WSD the availability of a specialised occupational health service was deemed to be valuable by some in assisting them to manage their WSD and either remain in work or return to work after absence. However, accessing Occupational Health services was seen by others as being detrimental to their career progression and there was a reluctance to disclose their WSD and attend Occupational Health services as they feared being stigmatised. This fear was reported by Wright (2016) where it was perceived by NHS healthcare workers that Occupational Health was a

place to go once it was too late to do anything else and that they were about to lose their job. This myth was dispelled by a newly established service by simply changing the name of the service to a more proactive name around musculoskeletal wellbeing resulting in the new service saving the Health Trust in England thousands of pounds. This style of Occupational Health provision could be investigated further together with studying the barriers to referral of staff to Occupational Health services.

The lifestyle choices of the study participants were perceived to impact on their risk of WSD particularly in relation to pregnancy, childcare, part-time working and financial issues which particularly impacted on women. This is of particular concern as physiotherapy remains a predominantly female profession, where managing work and domestic arrangements continues to remain the domain of the woman. The return to work whilst still not at full physical fitness and the demands of family life limit time to maintain fitness which has previously been identified as a method to reduce the risk of WSD. This juggling of demands often leads to fatigue and thus further increases the risk of WSD.

The benefit of adherence to a healthy lifestyle has been recognised in undergraduate nurses, occupational therapists and physiotherapists (Kamwendo, 2000) and more recently in nurses in the USA Wrunk (2016) and Felicilda-Reynaldo (2016) who both recognised that support to enable this reaps benefits in relation to staff wellbeing and patient care. It would be of value to implement a physical activity programme within the Health Board, to provide lifestyle advice and support to facilitate individuals in their endeavours to maintain their fitness to work.

These issues were found within the data (see chapter 5 section 5.2.3) which were further abstracted for the development of the Mixer Theory. In this theme all of the constructs and sub-constructs are apparent except for the sub-construct of the organisation in the construct of Loyalty.

This discussion has synthesized the data from this study with previous literature and has recognised areas which have not previously been recognised. It has considered the abstraction of the themes for the constructs

of the Mixer Theory. It is apparent that each theme contributes to each of the constructs to a greater or lesser degree, except for the construct on Infallibility in theme 1. This spread of data for each construct supports the validity of the constructs within the Mixer Theory in representing the data. The new evidence needs further consideration and its impact (7.1 and 7.3) and future study (7.4) are discussed in chapter 7.

7 Conclusion

The conclusion presents the key findings of the study, discusses the limitations of the study, suggests areas for further research and makes recommendations. Finally it identifies the new contribution to knowledge from the study's findings.

7.1 Key findings

The purpose of this study was to create a theory regarding the contributory and risk reduction factors for work-related spinal disorders in the physiotherapy profession (figure 10). This was achieved through exploring with physiotherapists, who had experienced work-related spinal disorders, the factors they perceived contributed to, and reduced the risk of, work-related spinal disorders. The study used a constructivist grounded theory methodology using semi-structured interviews. Two pilot interviews were conducted and fourteen further participants were recruited from a purposive sample, three were randomly selected and eleven were theoretically sampled directed by the data analysis. Data analysis was through line-by-line coding and followed by initial coding. This coding focused the data collection and theoretical participant recruitment and was iterative in nature. Secondary coding and focused coding synthesised the initial codes by grouping and three Themes emerged – The Institution, The Job and The Individual. Each theme had their own factors and sub-factors which included management/organisation, physiotherapy service provision, physiotherapy practice, team effect, handling, risk assessment, physiotherapists' career timeline and personal responsibility. Some of the key findings supported previous evidence especially around the factor of physiotherapy practice as a contributory factor. However, a number of factors emerged from the data which had not previously been reported and centred round the impact of the organisation, the effect of team working, personal responsibility particularly with reference to personal fitness for the job, and physiotherapists' attitude towards and implementation of manual handling training and risk assessment. The interconnectedness of the factors to each other is demonstrated in the theoretical model (figures 8, 9) suggesting that WSD is a multi-factorial problem which cannot sit in isolation from any of the factors. From this model

a substantive theory was created by further abstraction of the data and a Mixer Theory, including the constructs of Knowledge, Loyalty, Infallibility and Responsibility, evolved. The recognition and understanding of the theoretical framework and the Mixer Theory developed from the findings will raise awareness to enhance the future safety of physiotherapists. However, this theory represents the complexity of the factors and their inter-relations as they impact upon WSD in the physiotherapy profession and highlights that any intervention to increase the safe practice of physiotherapy, and to reduce the prevalence of WSD in physiotherapists, would need to be multi-factorial in approach requiring involvement of the whole range of contributors from the NHS as an institution to each individual physiotherapist.

7.2 Limitations of the study

This study followed the defining premises of constructivist grounded theory including theoretical sampling, concurrent data analysis and collection and co-construction of a theory. It was based on an appropriate theoretical background of a constructivist and pragmatic ontology and epistemology and acknowledged the influence of the researcher. It sought consultation with outside stakeholders, attained the required ethical approvals and implemented components to ensure a rigorous study. Adequate data was collected to identify the concept of data sufficiency. However, there were nevertheless, limitations to the study.

The main limitation was the location of the study within one Health Board in Wales as siting it within more than one Health Board may have made the evolved theory more applicable to other physiotherapy situations. The Health Board provided a very comprehensive breadth of physiotherapy localities and thus recruitment resulted in a wide spread of clinical specialities and physiotherapy Bands. However, access to some clinical areas were either impossible to arrange or were denied resulting in the non-representation of the perceptions of some clinical specialities which would have added further depth of data. This study was cited in Wales as no previous studies of the topic had occurred in this country. Whilst the findings from the study can be related to the NHS in Wales, differences in the NHS provision in Wales with respect to other countries within the UK may mean that it cannot be related to

the NHS in England or the other devolved countries of Scotland and Northern Ireland.

This study concentrated on qualified physiotherapists who had experienced a WSD and did not include qualified physiotherapists without experience of WSD. Nor did it include physiotherapy assistants, physiotherapy technicians, retired physiotherapists or student physiotherapists, with or without experience of WSD. Each of these groups would have valuable perceptions to add to the depth of the data and understanding of the factors related to WSD in physiotherapy.

This study was conducted in the NHS within a large Health Board providing secondary and tertiary healthcare. It did not include physiotherapists working within primary healthcare settings or other physiotherapy providers including Social Services and private practice whose perceptions on the topic would provide further breadth of data.

The limitations to this study offer opportunities for further research (see 7.4).

7.3 Implications of the study

This study, and any further research, has the possibility of engendering change which could be beneficial for safe practice for physiotherapists and potentially other healthcare workers. As such the implications of this study need to be considered.

The findings of this study demonstrate the breadth of the topic and range of factors that have been considered to influence the risk, or the reduction of risk, of WSD. Some of the factors were unsurprising as they reflected previous work but new information not previously identified was also acknowledged. The findings which were distilled into three themes, the Institution, the Job and the Individual, were further abstracted into four constructs within the Mixer Theory with an outcome of safe practice. Thus the implications of this study can be considered to impact on a wide range of situations and are considered here in relation to the Mixer Theory which was constructed from this study.

The construct of Knowledge in the Mixer Theory has implications for Higher Education Institutions (HEI) in relation to the propositional knowledge taught during pre-registration programmes and to the NHS within Wales relating to the required knowledge to complete the All Wales Manual Handling Passport. What knowledge, how it is delivered and assessed is worth reconsideration. Procedural knowledge has implications in service delivery for patients within this Health Board in Wales. Again this may impact on HEIs which need to consider what and how manual and therapeutic handling skills are taught, practised and assessed to ensure safe practice is at the forefront of every graduating physiotherapist's mind. The continuing development of propositional and procedural knowledge is the responsibility of the individual physiotherapist and of the NHS to enable the delivery of safe and effective therapeutic care. To this end the individual needs support from their manager and the NHS to enable continuing professional development (CPD). Manual handling training is mandatory within the Health Board though the participants in this study suggested that the training could be made more physiotherapy specific and that ongoing CPD could involve manual handling experts within a team whose responsibility it was to act as a resource for others to ensure continuing everyday awareness and knowledge.

The construct of Loyalty has implications for patient care as physiotherapists, especially in their early career, appear to have greater loyalty to the patient than they do to their own self-care. This can lead to them potentially carrying out unsafe working practices for the benefit of the patient and the detriment of an individual physiotherapist. Whilst care and compassion are desirable features in a therapist, and is often the reason an individual will enter the profession, and its encouragement is important (Francis Report, 2013) there are implications for the service provision of unsafe practice. Unsafe practice has not only a personal impact on the individual who has the potential for injury, but also an impact on service provision as the acquisition of WSD has implications in terms of sickness absence, for effective team working and pressure on other members of staff and therefore affecting patient care with possible influences on outcome achieved, number of bed day stays in hospital, discharge times and quality of care. Loyalty to the team itself has

implications in relation to WSD with a reluctance to take sickness absence with the potential of increasing the severity of a WSD. Conversely the loyalty of team members can support an individual during a WSD allowing them to contribute positively to work. Sickness absence has cost implications for the NHS as well as limiting the care delivery. Ultimately the perceived limited loyalty of the NHS as an organisation to the individual may result in reduced reciprocal loyalty of the individual to the organisation potentially reducing retention to physiotherapy as a profession and the NHS as an organisation.

The construct of Infallibility has implications for HEIs, the CSP and the individual. Pre-registration education needs to embed risk assessment and safe practice into all programme material and ensure that pre-registration students are fully aware of WSD and their role in caring for themselves. This may also have implications for pre-entry to HEIs in relation to occupational health screening at initial entry onto pre-registration programmes which currently remains confidential. Disclosure, with their permission, to an HEI of any information which may make an individual more susceptible to WSD may assist in personalising pre-registration education. Knowledge about type of behaviour also has implications for advertising and recruitment material used by the profession (CSP) and by HEIs for recruitment. Once qualified the responsibility passes to the NHS to manage expectations of newly qualified and early career physiotherapists. The awareness of the response in younger and early career physiotherapists, identified in this study, which appears to lower the priority of their own safety resulting from raised perceptions of their own physical and professional ability, is valuable for the NHS to understand to tailor the management of this group of physiotherapists for safest practice during this vulnerable period of their careers

The construct of Responsibility has wide ranging implications. The responsibility of the NHS to its staff raises issues especially in relation to the previously mentioned perceived limited loyalty of the physiotherapists to NHS as an institution. Despite the impact of the political and financial climate, care delivery could be maintained and/or improved by improving two-way communication. In an increasingly litigious culture the NHS as an institution has a responsibility to husband its resources for patient care services rather

than settlement payments for staff suits for inadequate health and safety care. Thus the NHS, and in this case the Health Board must be responsible for providing adequate and appropriate concern for its staff. Leadership and leadership training within the profession is high on the agenda of the CSP aiming to improve all aspects of service delivery (CSP, 2018). In addition to service delivery the physiotherapy managers have a responsibility to manage their staff in a proactive and supportive way to allow for an open communication pathway and practical interventions to encourage safe practice. Currently management styles tend towards strategic management the higher the grade of the manager. However, managers lower in the hierarchy, for example a team leader, may benefit from increased procedural management styles incorporating activities to identify and improve safe practice in a specific area of practice. Good managerial practices may be beneficial to staff retention within the profession and the NHS. Also identified under this construct is the responsibility of the individual physiotherapist to carry out the job in as safe a way as possible. Although the job cannot be totally without risk the individual can employ strategies to reduce their individual risks both during working hours and in their personal lives.

The implications of the Mixer Theory applies to a wide range from the national institution of the NHS through HEIs, professional bodies to the individual physiotherapist. Identified within the further research section (7.4) are some potential outcomes from the research in the future and the subsequent section (7.5) makes some recommendations generated from this study.

7.4 Suggestions for further research

As suggested in 7.2 and 7.3 this study has given rise to the possibility of numerous further studies based either on investigating the new findings recognised in this study or increasing the knowledge around already identified issues, to improve understanding and increase safe practice. Such a range of further study could produce a plethora of diverse studies which may take knowledge and understanding further or they could dilute the evidence and not enhance knowledge and understanding. Therefore to garner the most out of the future studies it would be desirable to focus further research. This focus, which is presented in this section, should follow two stands – one

strand whose studies would aim to raise the Mixer Theory from a substantive to a formal theory and a second strand which concentrates on the four constructs of the Mixer Theory. Therefore the focus of this section will be on studies which validate and formalise the Mixer Theory and those which are related to the Mixer Theory.

Urquart et al. (2010) suggest that to raise a theory from substantive to formal the theory should be tested in other contexts whilst Charmaz (2006) explains that validation of a new theory can occur using a similar approach. Therefore, to validate the Mixer Theory and raise it above a substantive theory to a formal theory, the study could be carried out in other countries of the UK, which do not deliver the mandatory training in the NHS through the use of the All Wales Manual Handling Passport (England, Scotland and Northern Ireland).

Further research which is centred on the Mixer Theory would consider each of the constructs. For the Knowledge construct there are three underlying sub-constructs – propositional, tacit and procedural knowledge. To investigate propositional and procedural knowledge quantitative studies on the kinetics and kinematics of routine physiotherapy practices used in rehabilitation could be carried out, the results of which could be used in the development of safer handling practices and which could inform the mandatory manual handling training. Similar studies could investigate physiotherapists using hoists and other mechanical handling aids in their work location which could give valuable data regarding loading of the physiotherapists. This may be used to help develop new style handling equipment to assist in reducing the load on physiotherapists thus improving safe practice.

Propositional and procedural knowledge delivered in the mandatory manual handling training was found to be useful to a degree but that profession specific handling training was considered desirable. Therefore research could involve exploring what was perceived to be required in physiotherapy specific manual handling training, modes of delivery and frequency. The effect of any physiotherapy specific manual handling training would subsequently need to be investigated.

All of the sub-constructs of knowledge (propositional, tacit and procedural) may be examined by exploring with older and more experienced and/or retired physiotherapists the strategies they employ/employed to remain working safely which could be useful to younger staff in preventing WSD. Knowledge of the psychological effect of a WSD in this population would be valuable to inform good management practices to support them and ease transitions.

The construct of loyalty has four sub-constructs – patients, colleagues, organisation and self. Team working was identified in the study as something which could impact both positively and negatively on safe practice and therefore warrants further investigation. Qualitative studies could explore the impact of the team in relation to its effect on staff of all levels including student physiotherapists. These types of studies would address the sub-constructs both of colleagues and of self. A further study which considers the organisation, colleagues and self would further explore the fact that physiotherapists identify themselves closely with physiotherapy teams and less so to multidisciplinary teams as identified in this study. This professional identity is worth exploring in relation to its impact on safe working practice in relation to the patients, colleagues and self with the aim of identifying potential ways of maximising the team effect for safer practice.

The construct of Infallibility had two sub-constructs – youth and perceived knowledge. To explore issues around youth with student physiotherapists, their views on WSD, manual handling and risk assessment could inform the delivery of this knowledge at pre-registration education with the aim of increasing the awareness and implementation of safe practice from early career onwards. This could be taken one step further back to explore the views of prospective students prior to entry to establish a base-line level of understanding which could inform pre-registration education and recruitment initiatives. Gathering data from pre-entry or first year physiotherapy students regarding their understanding of the physicality of the work and manual handling would assist in developing promotional material for schools to properly inform prospective students. The early career of the physiotherapists was identified in this study to be of particular importance in establishing safe practice and therefore a study of this group could be valuable. Exploration of

their perceptions of WSD, safe practice, infallibility, manual handling and risk assessment training and knowledge and team working, and how these may effect safe practice would further knowledge.

The fourth construct of responsibility has four sub-constructs – the institution, manager, individual and job. As previously identified the participants in this study acknowledged that they felt they had little influence on the institution of the NHS. The findings from future research may have the potential to inform this and lead to change to alter this situation. As it is the responsibility of the institution to provide appropriate training the potential use of in-service training around the use of risk assessment and manual handling activities was recommended from this study. Base-line data prior to in-service training programmes would need to be compared to that post training to measure the effects of this type of specific programme.

Studies combining the sub-constructs of the institution, the manager and the individual could focus around an issue identified by this study, that many participants associated a stigma with accessing Occupational Health services which reduced their use of the service. Therefore an exploration of the barriers to the use of Occupational Health services as perceived by all within the profession may be valuable, with the intention of reducing the stigma and increasing up-take of the service. Investigating the uptake and use of Occupational Health services by other healthcare workers could be valuable in understanding people's perceptions of it, aiming at advertising and promoting its services appropriately which could increase safe practice.

Although many participants identified that the individual had a responsibility to working safely within the confines of their job, the use of risk assessment was found to be erratic. Therefore, further research could involve qualitative exploration of the perceptions around risk assessment and its implementation in practice exploring the sub-constructs of the manager, the individual and the job. Barriers and facilitators to the use of risk assessment could be explored which might result in modification of work practices in the Health Board to improve their use. Further studies around aspects of the job could explore the perceptions of physiotherapy assistants and physiotherapy technicians, the

use of whom is recognised as a method of practice modification employed by physiotherapists to reduce WSD (Chapter 2 section 2.4). Findings from this may enlighten factors which are experienced by these employee groups which are similar and/or different to those of qualified autonomous professionals. If similarities and differences are acknowledged there is the potential to refine the education and training these groups are required to undertake mandatorily or which they access for their personal development, to improve safe practice and to inform the implementation of appropriate recommendations (7.5).

Studies as suggested above would initially formalise the Mixer Theory and then use its' constructs in studies to deepen the understanding and awareness of WSD within the physiotherapy profession. To further validate a theory it is suggested it needs to be transferable to other contexts (Urquhart et al., 2010) which requires the Mixer Theory to be applicable in other healthcare worker populations, including physiotherapy assistants and technicians as well as nursing and other Allied Health Professions. Different healthcare environments including primary and tertiary health delivery situations would also be a valuable testing ground. These contexts, away from the original context of the Mixer Theory would, inevitably, pose challenges to its use in respect to differences in professional cultures, job roles, underpinning knowledge bases, different manual handling training and the type of healthcare delivered. However, using the Mixer Theory as a basis upon which to deepen understanding may result in adapted or modified theories, specific to scenarios, if this is found to be necessary. This Mixer Theory can act as a catalyst for greater understanding of safe working practice within healthcare.

In addition to the potential for future research identified in this section this study was also able to make recommendations.

7.5 Recommendations

Despite its limitations this study is able to underpin recommendations, based on the findings, the creation of the Mixer Theory and suggestions for future research, to help reduce the risks of WSD in physiotherapists.

The primary recommendation would be to raise the profile of risk assessment and handling within routine physiotherapy practice which address issues around the knowledge and the responsibility constructs of the Mixer Theory. A review of the learning material available to pre-registration students regarding propositional and procedural knowledge on the topic should be considered to facilitate access and understanding. The concept of safe practice needs to be embedded within all pre-registration learning and teaching and should be given a high priority and a prominent profile. To gain recognition by the CSP as well as the host HEI, every pre-registration programme is subject to a revalidation process every five years. The minor changes in content and delivery required to achieve a higher profile of safe practice within a pre-registration programme could be incorporated into the next programme revalidation and monitored on a quinquennial basis to incorporate up-to-date propositional and procedural knowledge.

The construct of responsibility within the Mixer Theory recognised the responsibility of the NHS as an institution. A recommendation from this study would be a campaign similar to that used to raise the profile of hand-washing as a method of reducing infection, should be implemented across the NHS. Unless the extent and impact of WSD on staff absence, staff retention, reduced service delivery and its consequences are recognised it is unreasonable to expect such a campaign to be supported in the current climate. Therefore a programme to highlight these issues at the highest level should be considered with the expectation of the implementation of a programme to raise the profile of the use of risk assessment and manual handling across Wales (Appendix 15). Achieving the implementation of this campaign may take a long time and subsequently further time to change the culture towards WSD's risk factors and it should therefore be considered as a long-term aim. However, the responsibility construct would advocate the responsibility of managers and individuals and thus strategies could be implemented more locally, including the use of posters in the workplace, as was used for the hand washing campaign, and using the physiotherapists' annual performance review as an opportunity to open discussion around safe practice and WSD.

Secondary recommendations evolved from one or more of the constructs of the Mixer Theory. The knowledge and responsibility constructs lead to the recommendation that the use of safe practice embedded in practice should be encouraged through CPD and specific mentoring. Currently mentoring and CPD is utilised for the development of clinical skills and clinical reasoning and recognition that mentoring could encompass safe work practice and include manual handling and risk assessment would raise their profile. A programme of intra-level and inter-level mentoring around the topic of WSD and safe practice would raise the profile, reduce anxiety, spread the responsibility to all and potentially access a person's tacit knowledge. This would support the construct of loyalty, infallibility and responsibility as it would address issues around early career physiotherapists, management strategies and team working and loyalty to self.

All four constructs are involved in the perception that manual handling, risk assessment and good body mechanics was better during undergraduate physiotherapy education than once qualified. It has already been identified above that physiotherapy education providers must maintain their responsibility to raise the profile, highlighting and continuing to encourage safe practice to ensure it is embedded in physiotherapists' practice once leaving physiotherapy education. However it is also the responsibility of the NHS, the managers and the individuals to provide and access appropriate training. Wales has an established All Wales Treatment Manual Handling Group and it is recommended that the traffic light system for risk assessment, developed by the group and implemented across Wales, be reviewed in light of the reduced compliance with risk assessment and the limited awareness of the traffic light system (Appendix 15). The introduction of manual handling and risk assessment in-service training within the Health Board is recommended. This should address the specific needs of each clinical environment and thus provide physiotherapy, clinically and environmentally specific training to supplement the generic mandatory All Wales Manual Handling Passport. As identified in sections 7.3 and 7.4 the use of manual handling and risk assessment mentors and/or champions within each clinical area is recommended to raise the awareness and to maintain its importance in

periods between mandatory manual handling training courses when there is a tendency for its significance to drop.

Recognising the constructs of responsibility, loyalty and infallibility it is recommended that management plans be developed prompted by the author disseminating the study results and use of the Mixer Theory to the All Wales Physiotherapy Managers Group (Appendix15). This could be developed either locally or at an All Wales level, to assist the safe introduction into working life within the NHS for early career physiotherapists, and for the management of safe commencement of rotations within the early years, addressing their perceptions of fallibility and role in relation to the patient.

Data from this study suggests that pre-entry knowledge of the physicality and the risks of the job could be raised. The author will commence discussions with physiotherapy education providers in Wales and the CSP to encourage the incorporation of information in their promotional material for pre-entry candidates. The development of on-line resources for pre-entry applicants to access regarding an accurate representation of the role of a physiotherapists is recommended as an outcome of such discussions. In addressing the infallibility construct it is recommended that the occupational health service of the education provider should be updated regarding the role of the physiotherapist to enable a more informed assessment at programme entry. Counselling regarding suitability to the work as a physiotherapist, rather than solely that of a student, should be made available to pre-registration students.

7.6 New contribution to knowledge

The study aimed to fill a gap in the research which exists currently. To date the studies around the topic of work-related musculoskeletal disorders in physiotherapy have primarily considered the prevalence rate, causes and how physiotherapists respond to such injuries of either WMSD in general or WSD usually low back pain. Much of the previous research has involved nursing and the previous work on physiotherapy has been fairly repetitive, identifying prevalence rates of WMSDs and WSD and using mostly survey style methodologies. The limited qualitative literature restricts the full understanding as perceived by those who are practicing physiotherapy

within the NHS. In this respect this study differed from previous studies in several ways. It concentrated on the whole spine rather than simply the low back or the whole spine in conjunction with all other work-related musculoskeletal disorders. It did not consider prevalence rate, which had previously been fairly clearly established by several previous studies in a variety of countries and clinical situations nor did it explore how physiotherapists respond to any such injury. The prevalence rate does not appear to have altered significantly in the last three decades and similarities in response to such injuries has been identified and, therefore, repeating these types of studies offers nothing new to the evidence.

When considering the causes of WMSDs and WSDs in physiotherapists the majority of previous studies have offered the participants pre-identified options, mostly based on physical and biomechanical factors, from which to make a choice using a questionnaire method. Therefore, the physiotherapists' own views on this topic have not previously been sought. Only a small number of studies have explored aspects other than physical and biomechanical factors and therefore the qualitative data remains limited.

Previous studies have been conducted in a variety of geographical locations including USA, Australia, Turkey, Slovenia and African countries and only a few have been identified which consider this topic in the UK. As working practices vary from country to country it is appropriate to further increase the evidence base for practicing physiotherapists in the UK, the majority of whom practice within the National Health Service (NHS). There have been no studies on this topic in Wales, which is a devolved country of the UK which has responsibility for its own health service, and therefore the study was unique in that context.

This study was the first study which had elicited the perceptions directly from physiotherapists experiencing the conditions of practice within the NHS and has uncovered previously unknown evidence in relation to physiotherapy.

The impact of the employing institution and the ethos of the NHS, now and in the future, was felt to have a negative impact. The feeling of lack of influence over the institution compounded the perceptions of negativity

towards the NHS as an employer. In the current financial and political climate it is unlikely that this will improve unless the NHS recognises and responds to the feelings of their major asset, the staff. The current climate within the UK suggests that the newly identified impact of the increasingly complex and more obese/bariatric patients will continue to impact on WSD in physiotherapists. The style of management, recognised in other occupational settings to be influential, has not previously been recognised within physiotherapy in relation to WSD. The design of the environment was newly identified as influencing the risk of WSD in both new and old establishments, and physiotherapists' involvement in design facilitates reduction of WSD. The use of computerised appointment systems out of the physiotherapists control was perceived to increase risk of WSD and could be remedied by returning control to the individual physiotherapist.

The physicality of the job is well established though this study newly identified that there is a lack of knowledge about the physicality in pre-entry and undergraduate physiotherapists. The fatigue resulting from the physicality of the work was recognised in this study as contributing to WSD. Contrary to the physicality of the job it was identified that the increased administrative work involved in routine physiotherapy practice increases the risk of WSD. The impact of the team on WSD was identified in community and ward based physiotherapy practice but not in out-patient practice. When physiotherapists referred to teams they identified with the physiotherapy team rather than a larger multi-disciplinary team. It was newly recognised that physiotherapy team working produced dichotomies in relation to the team versus the individual physiotherapist and that team working does have negative, as well as positive, impacts on WSD. This study also identified a concern regarding physiotherapists' attitude towards, and implementation of manual handling training and risk assessment that has potentially negative influences on WSD.

A newly recognised factor was the impact early career behaviour had on WSD in their early career and as the physiotherapists moved through their career. Risky behaviour in relation to WSD early in the career was perceived to contribute to WSD later in life. The implications of the rotational nature of the early career physiotherapist were perceived to be negative towards WSD.

Perceptions about the increasing age of the workforce and the increasing age of retirement, and the impact these have, caused concern for risks of WSD. The increasing percentage of older physiotherapists in the workforce in to the future, and the limited options to safely remain in practice, were perceived to be a risk of increasing WSD in the later career.

The responsibility physiotherapists felt to remain fit enough to do the job and avoid WSD was newly recognised. Lifestyle choices were recognised to potentially negatively impact on their ability to remain fit and were perceived to relate to females more than males, due to the pregnancy, childcare and family life responsibility nature of the influences. The limited engagement with Occupational Health services was newly recognised in relation to physiotherapists with WSD.

This original study sought, for the first time, to explore physiotherapists' own perceptions on the contributory and risk reduction factors for spinal pain specifically, which included lumbar, thoracic and cervical regions and not solely the lumbar region, in relation to physiotherapy practice within the NHS in the UK and specifically in Wales. A recognition of those factors newly identified by this study will to able to be used in the development of strategies to improve the safety of physiotherapy practice. Some recommendations were made regarding ideas for, and implementation of, such strategies for safer practice in physiotherapy. The creation of the Mixer Theory (Figure 10), involving physical, emotional and cultural issues, which evolved from the use of a constructivist grounded theory approach provides a catalyst which can be tested in other clinical situations and professions and to evaluate and improve practice in physiotherapy in relation to WSD. This may enable evidence to support changes to pre-registration education, provision of mandatory manual handling training and/or organisational arrangements in the NHS, where appropriate and feasible, in order to ensure the safest working practices for physiotherapists. Further research of the new fields identified will increase the future understanding and benefit physiotherapists as they continue their practice in an ever challenging environment. Further study using the Mixer Theory should raise it from a substantive theory to a formal theory which will

increase its influence on safe practice within other professions and institutions in addition to physiotherapists in the NHS.

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Appendices

Appendix 1 Literature search strategy

Print Search History | Retrieve Searches | Retrieve Alerts | Save Searches / Alerts

Select / deselect all		Search with AND	Search with OR	Delete Searches	Refresh Search Results
Search ID#	Search Terms	Search Options	Actions		
S21	S9 AND S20	Search modes - Boolean/Phrase	Rerun	View Details	Edit
S20	S11 OR S12 OR S13 OR S14 OR S16 OR S19	Search modes - Boolean/Phrase	Rerun	View Details	Edit
S19	(MH "Dietetics") OR (MH "Medical Illustration") OR (MH "Occupational Therapy+") OR (MH "Chiropractic") OR (MH "Optometry") OR (MH "Osteopathy") OR (MH "Podiatry")	Search modes - Boolean/Phrase	Rerun	View Details	Edit
S18	S9 AND S17	Search modes - Boolean/Phrase	Rerun	View Details	Edit
S17	S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16	Search modes - Boolean/Phrase	Rerun	View Details	Edit
S16	professions allied to medicine	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun	View Details	Edit
S15	(MH "Allied Health Professions+")	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun	View Details	Edit
S14	professionals allied to medicine	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun	View Details	Edit
S13	radiographer*	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun	View Details	Edit
S12	(MH "Radiologic Technologists")	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun	View Details	Edit
S11	"occupational therap*"	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun	View Details	Edit
S10	(MH "Occupational Therapists")	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun	View Details	Edit
S9	S1 OR S8	Search modes - Boolean/Phrase	Rerun	View Details	Edit
S8	S6 AND S7	Search modes - Boolean/Phrase	Rerun	View Details	Edit
S7	S2 OR S3	Search modes - Boolean/Phrase	Rerun	View Details	Edit
S6	S4 OR S5	Search modes - Boolean/Phrase	Rerun	View Details	Edit
S5	occupation*	Search modes - Boolean/Phrase	Rerun	View Details	Edit
S4	work N3 relate*	Search modes - Boolean/Phrase	Rerun	View Details	Edit
S3	back N3 pain*	Search modes - Boolean/Phrase	Rerun	View Details	Edit
S2	(MH "Back Pain+")	Search modes - Boolean/Phrase	Rerun	View Details	Edit
S1	(MH "Occupational Diseases+")	Search modes - Boolean/Phrase	Rerun	View Details	Edit

FIGURE 11: SCREEN SHOT OF LITERATURE SEARCH - AHPS/BACK PAIN AUG 2015

[New Search](#)
[Publications](#)
[CINAHL Headings](#)
[Evidence-Based Care Sheets](#)
[More](#)

[Sign Out](#)
[Folder](#)
[Preferences](#)
[Languages](#)
[Email Librarian](#)
[Help](#)


 Searching: CINAHL Plus with Full Text | Choose Databases

[Basic Search](#)
[Advanced Search](#)
[Search History](#)

Search History/Alerts

[Print Search History](#)
[Retrieve Searches](#)
[Retrieve Alerts](#)
[Save Searches / Alerts](#)

Select / deselect all

Search ID#	Search Terms	Search Options	Actions
S39	S33 AND S36	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun View Details Edit
S38	S33 AND S36	Search modes - Boolean/Phrase	Rerun View Details Edit
S37	S33 AND S36	Search modes - Boolean/Phrase	Rerun View Details Edit
S36	S23 OR S35	Search modes - Boolean/Phrase	Rerun View Details Edit
S35	(MH "Nurses by Educational Level+") OR (MH "Nurses by Specialty+") OR (MH "Staff Nurses") OR (MH "Nursing Staff, Hospital") OR (MH "RN First Assistants") OR (MH "Pediatric Nurse Practitioners+") OR (MH "Nurses, Other+")	Search modes - Boolean/Phrase	Rerun View Details Edit
S34	S24 AND S33	Search modes - Boolean/Phrase	Rerun View Details Edit
S33	S25 OR S32	Search modes - Boolean/Phrase	Rerun View Details Edit
S32	S30 AND S31	Search modes - Boolean/Phrase	Rerun View Details Edit
S31	S26 OR S27	Search modes - Boolean/Phrase	Rerun View Details Edit
S30	S28 OR S29	Search modes - Boolean/Phrase	Rerun View Details Edit
S29	occupation*	Search modes - Boolean/Phrase	Rerun View Details Edit
S28	work N3 relate*	Search modes - Boolean/Phrase	Rerun View Details Edit
S27	back N3 pain*	Search modes - Boolean/Phrase	Rerun View Details Edit
S26	(MH "Back Pain+")	Search modes - Boolean/Phrase	Rerun View Details Edit
S25	(MH "Occupational Diseases+")	Search modes - Boolean/Phrase	Rerun View Details Edit
S24	S22 OR S23	Search modes - Boolean/Phrase	Rerun View Details Edit
S23	nurs*	Search modes - Boolean/Phrase	Rerun View Details Edit
S22	(MH "Nurses+")	Search modes - Boolean/Phrase	Rerun View Details Edit

FIGURE 12: SCREEN SHOT OF LITERATURE - SECOND SECTION - NURSE/BACK PAIN UK AND IRELAND ONLY 2005 - 2015

<input type="checkbox"/>	S21	S9 AND S20	Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S20	S11 OR S12 OR S13 OR S14 OR S16 OR S19	Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S19	(MH "Dietetics") OR (MH "Medical Illustration") OR (MH "Occupational Therapy+") OR (MH "Chiropractic") OR (MH "Optometry") OR (MH "Osteopathy") OR (MH "Podiatry")	Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S18	S9 AND S17	Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S17	S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S18	Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S16	professions allied to medicine	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S15	(MH "Allied Health Professions+")	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S14	professionals allied to medicine	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S13	radiographer*	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S12	(MH "Radiologic Technologists")	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S11	"occupational therap**"	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S10	(MH "Occupational Therapists")	Limiters - Published Date: 20050101-20151231 Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S9	S1 OR S8	Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S8	S6 AND S7	Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S7	S2 OR S3	Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S6	S4 OR S5	Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S5	occupation*	Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S4	work N3 relate*	Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S3	back N3 pain*	Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S2	(MH "Back Pain+")	Search modes - Boolean/Phrase	Rerun View Details Edit
<input type="checkbox"/>	S1	(MH "Occupational Diseases+")	Search modes - Boolean/Phrase	Rerun View Details Edit

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FIGURE 13: SCREEN SHOT OF LITERATURE SEARCH - FIRST SECTION - NURSE/BACK PAIN UK AND IRELAND ONLY 2005 - 2015

Search History/Alerts

[Print Search History](#) | [Retrieve Searches](#) | [Retrieve Alerts](#) | [Save Searches / Alerts](#)

<input type="checkbox"/> Select /deselect all		Search with AND	Search with OR	Delete Searches	Refresh Search Results
Search ID#	Search Terms	Search Options		Actions	
<input type="checkbox"/>	S14	S3 AND S13	Search modes - Boolean/Phrase		Rerun View Details Edit
<input type="checkbox"/>	S13	S4 OR S12	Search modes - Boolean/Phrase		Rerun View Details Edit
<input type="checkbox"/>	S12	S8 AND S11	Search modes - Boolean/Phrase		Rerun View Details Edit
<input type="checkbox"/>	S11	S9 OR S10	Search modes - Boolean/Phrase		Rerun View Details Edit
<input type="checkbox"/>	S10	occupation*	Search modes - Boolean/Phrase		Rerun View Details Edit
<input type="checkbox"/>	S9	work N3 relate*	Search modes - Boolean/Phrase		Rerun View Details Edit
<input type="checkbox"/>	S8	S5 OR S6 OR S7	Search modes - Boolean/Phrase		Rerun View Details Edit
<input type="checkbox"/>	S7	back N3 pain*	Search modes - Boolean/Phrase		Rerun View Details Edit
<input type="checkbox"/>	S6	(MH "Musculoskeletal Diseases+")	Search modes - Boolean/Phrase		Rerun View Details Edit
<input type="checkbox"/>	S5	(MH "Back Pain+")	Search modes - Boolean/Phrase		Rerun View Details Edit
<input type="checkbox"/>	S4	(MH "Occupational Diseases+")	Search modes - Boolean/Phrase		Rerun View Details Edit
<input type="checkbox"/>	S3	S1 OR S2	Search modes - Boolean/Phrase		Rerun View Details Edit
<input type="checkbox"/>	S2	physiotherap*	Search modes - Boolean/Phrase		Rerun View Details Edit
<input type="checkbox"/>	S1	(MH "Physical Therapists")	Search modes - Boolean/Phrase		Rerun View Details Edit

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FIGURE 14: SCREEN SHOT OF LITERATURE SEARCH - PHYSIO/BACK PAIN AUG 2015

Appendix 2 Interview schedules

Initial Interview Schedule (V1)

An exploration of perceived contributory factors and prevention of work-related spinal disorders (WSD) in the physiotherapy profession

This interview schedule will only be appropriate for the first few interviews. Analysis of the data from the first interviews will iteratively inform subsequent interviews and therefore a definitive schedule is not possible.

Study Objectives:

To explore with physiotherapists who have experienced work-related spinal disorders the factors they perceive contribute to work-related spinal disorders.

To investigate the views of physiotherapists who have experienced work-related spinal disorders on how to reduce this type of disorder.

Questions

Would you like to choose a name which will be used as your pseudonym?

Are you clear about what I mean by work-related spinal disorder?

Explain and clarify as necessary

There is some evidence to suggest a variety of factors may be contributory (eg. Bork 1996, Cromie 2002). Are you aware of this evidence?

Can you please tell me what you think might contribute to work-related spinal disorders?

Could use prompts: Physical, professional, organisational, any other factors

Subsequent questions will develop from answer to this question to explore further

Do you have any examples?

Can you please tell me what you think could help reduce work-related spinal disorders?

Subsequent questions will develop from answer to this question to explore further

Can you please tell me what you think could help prevent work-related spinal disorders?

Subsequent questions will develop from answer to this question to explore further

Do you have any examples?

Interview Schedule V 2

An exploration of perceived contributory factors and prevention of work-related spinal disorders (WSD) in the physiotherapy profession

This interview schedule has been modified from version 1 used for pilot interviews. This interview schedule will only be appropriate for the first few interviews post pilot interviews. Analysis of the data from the first interviews will iteratively inform subsequent interviews and therefore a definitive schedule is not possible.

Introduction:

Thank you for coming and for agreeing to participate in this study. You have had an opportunity to see the PIS and to ask any questions. Is there anything further you would like to ask now? You have agreed to participate in this study and have signed an informed consent form but you are aware that you can withdraw at any time?

This study forms part of a thesis for a PhD from University of Brighton. My interest in the topic has arisen partly from my own experiences and partly as a result of study of physiotherapy and ergonomics. The prevalence rate of spinal pain in physiotherapists has not altered much over the last 30 years and I am interested in views of why you think physiotherapists get spinal pain and your views on how to reduce the risks. Your answers will be based on your own experiences and observations and there can be no right or wrong answer. There are only a few set questions and we will then explore

together your replies so it is likely to be more like a conversation. Are you OK to continue?

Study Objectives:

To explore with physiotherapists who have experienced work-related spinal disorders the factors they perceive contribute to work-related spinal disorders.

To investigate the views of physiotherapists who have experienced work-related spinal disorders on how to reduce this type of disorder.

Questions

Would you like to choose a name which will be used as your pseudonym?

How old are you?

What date did you qualify as a physiotherapist?

Did you do other work previous to becoming a physiotherapist?

Since becoming a physiotherapist could you give a brief précis of the areas in which you have worked, the duration and your grade at the time?

What area are you currently working and at what grade?

Are you clear about what I mean by work-related spinal disorder?

Explain and clarify as necessary

“Spinal, cervical, thoracic and lumbar, pain which is either caused by, or aggravated by, work. It does not necessarily have to have been caused by work. There may have been a specific incident or it may be insidious or occasional.”

There is some evidence to suggest a variety of factors may be contributory (eg. Bork 1996, Cromie 2002). Are you aware of this evidence?

Can you please tell me what you think might contribute to work-related spinal disorders?

Could use prompts: Physical, professional, organisational, any other factors

Subsequent questions will develop from answer to this question to explore further

Do you have any examples?

Can you please tell me what you think could help reduce the risks of work-related spinal disorders?

Subsequent questions will develop from answer to this question to explore further

Do you think there are factors outside of work environment which may contribute to or reduce the risks of, work-related spinal disorders?

Is there anything else you would like to add?

Interview Schedule V 3

An exploration of perceived contributory factors and prevention of work-related spinal disorders (WSD) in the physiotherapy profession

This interview schedule has been modified from version 2. Analysis of the data from the interviews using this schedule will iteratively inform subsequent interviews and therefore a definitive schedule is not possible.

Introduction:

Thank you for coming and for agreeing to participate in this study. You have had an opportunity to see the PIS and to ask any questions. Is there anything further you would like to ask now? You have agreed to participate in this study and have signed an informed consent form but you are aware that you can withdraw at any time?

This study forms part of a thesis for a PhD from University of Brighton. My interest in the topic has arisen partly from my own experiences and partly as a result of study of physiotherapy and ergonomics. The prevalence rate of spinal pain in physiotherapists has not altered much over the last 30 years and I am interested in views of why you think physiotherapists get spinal pain and your views on how to reduce the risks. Your answers will be based

on your own experiences and observations and there can be no right or wrong answer. There are only a few set questions and we will then explore together your replies so it is likely to be more like a conversation. Are you OK to continue?

Study Objectives:

To explore with physiotherapists who have experienced work-related spinal disorders the factors they perceive contribute to work-related spinal disorders.

To investigate the views of physiotherapists who have experienced work-related spinal disorders on how to reduce this type of disorder.

Questions

Would you like to choose a name which will be used as your pseudonym?

How old are you?

What date did you qualify as a physiotherapist?

Did you do other work previous to becoming a physiotherapist?

Since becoming a physiotherapist could you give a brief précis of the areas in which you have worked, the duration and your grade at the time?

What area are you currently working and at what grade?

Are you clear about what I mean by work-related spinal disorder?

Explain and clarify as necessary

“Spinal, cervical, thoracic and lumbar, pain which is either caused by, or aggravated by, work. It does not necessarily have to have been caused by work. There may have been a specific incident or it may be insidious or occasional.”

There is some evidence to suggest a variety of factors may be contributory (eg. Bork 1996, Cromie 2002). Are you aware of this evidence?

Can you please tell me what you think might contribute to work-related spinal disorders?

Could use prompts: Physical, professional, organisational, any other factors

Subsequent questions will develop from answer to this question to explore further

Do you have any examples?

Can you please tell me what you think could help reduce the risks of work-related spinal disorders?

Subsequent questions will develop from answer to this question to explore further

Do you think there are factors outside of work environment which may contribute to or reduce the risks of, work-related spinal disorders?

Please could you explain to me how you use Risk Assessment during your normal practice?

Is there anything else you would like to add?

Appendix 3 Participant Information Sheet

Philippa Coales
Physiotherapy
School of Healthcare Sciences
Cardiff University
Heath Park
Cardiff
CF14 4XN

Telephone: 029 2068 7732
Email: CoalesPJ@Cardiff.ac.uk

PARTICIPANT INFORMATION SHEET

An exploration of perceived contributory factors and prevention of work-related spinal disorders (WSD) in the physiotherapy profession in Wales.

My name is Philippa Coales and I am a physiotherapy lecturer at Cardiff University. I am undertaking a PhD at the University of Brighton and would like to invite you to take part in a research study which will be conducted as part of this Doctorate. Before you decide, 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 and you may like to discuss it with others. I can go through the information sheet with you if you wish and you may ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to participate. Part 1 tells you about the purpose of this study and what will happen if you take part. Part 2 gives you more detailed information about the conduct of the study.

Part One

What is the purpose of this study?

The prevalence rate of work-related spinal disorders is fairly consistent at about 35% of physiotherapy staff across both geographical and clinical areas. Despite the introduction of legislation and professional guidelines

aimed at protecting workers the rate has remained similar for the last two and a half decades.

The aim of this study will be to understand perceived causes and possible prevention of work-related spinal disorder in the physiotherapy profession by exploring this with physiotherapists who have experienced work-related spinal disorder. Who else is invited to participate will depend upon analysis of the information gathered from physiotherapists. A greater understanding will benefit the profession and may ultimately improve the safety of practicing physiotherapists.

Why have I been chosen?

You have been asked to take part in this study as either: (i) a practicing physiotherapist who has experienced work-related spinal disorder or (ii) another physiotherapist who has been identified from analysis of previous interviews as someone who would have a valid view on the topic. The interview will allow insight on your views on the causes and prevention of work-related spinal disorder in physiotherapists

Do I have to take part?

No, it is up to you whether or not to take part. If you do decide to take part after seeing the introduction letter and listening to the presentation at your team meeting you will be given this information sheet to keep. After you have had enough time to read through it and had any questions you may have answered you will be asked to sign a consent form. If you decide to take part, you will be free to withdraw at any time without giving a reason. Should you decide not to take part, you will not have to provide a reason for this decision.

What will happen if I take part?

If you wish to take part your views will be gathered via an individual interview. The interview will normally take place in Ty Dewi Sant on the Heath Park site and you will normally be asked to attend once. There is a small chance that following analysis of your interview transcript I would like to interview you for a second time. The second interview would again be

optional. Each interview will last up to an hour. The interviews will be audio-recorded and transcribed.

Data will be kept securely for a minimum of 10 years in accordance with good research practice and data protection regulations imposed by the University of Brighton in accordance with the Data Protection Act 1998. All data obtained during the study will remain confidential and will be anonymised to ensure comments are not attributable to any individual. Access to data will only be available to me and my academic supervisors

What will I have to do?

You will be asked to sign a participant consent form which includes the following clause: I understand that I may withdraw from the study at any time without it affecting me in any way. You will not have to explain why you want to withdraw.

You will be asked to attend Ty Dewi Sant, Heath Park at a mutually agreed convenient time. If this venue is not suitable for your needs another appropriate venue will be agreed between us. Travel expenses can be reimbursed on production of a receipt for journeys to the venue.

At the beginning of your visit the study will be explained to you in full and you will be asked for your consent, bearing in mind that you are free to withdraw at any time.

You will be interviewed on your own by me in a quiet and private room. The questions asked will ensure all study aims are addressed but will be flexible enough to allow you to express your views.

Are there any risks in participating in this trial?

The interviews will be carried out in a designated room in Cardiff University (Ty Dewi Sant) or other appropriate setting. Based on the University of Brighton Risk Assessment process any risk is considered minor low level risk. The interview will involve discussing personal and professional experiences and should you feel you require support following this interview

the confidential occupational health and counselling services of the University Health Board are available. Support from the Health Board's human resources department, the professional body (The Chartered Society of Physiotherapy) and/or another trade union could also be sought if required. Further support may be available through The All Wales Treatment Handling Group and/or The All Wales Occupational Physiotherapy Group.

Are there any benefits in participating in this trial?

There are no specific benefits to you as a participant from taking part in the study though reflection on the experience could form part of your Continuing Professional Development (CPD) portfolio. The information gained from this study will improve understanding to enhance the future safety of physiotherapists.

If the information in Part 1 has interested you and you are considering participation, please read the additional information in Part 2 before making any decisions.

PARTICIPANT INFORMATION SHEET

An exploration of perceived contributory factors and prevention of work-related spinal disorders (WSD) in the physiotherapy profession.

Part Two

What if new information becomes available?

In the unlikely event that new information becomes available during the course of the research project I will tell you about it and discuss with you whether you want to continue in the study. If you decide to withdraw, it will not affect you in any way and if you decide to continue, you will be asked to sign an updated consent form.

What will happen if I do not want to carry on with the study?

You will be free to withdraw from the study at any time. I will use the data collected up to the point of your withdrawal.

What if something goes wrong?

This study involves an individual interview in an appropriate environment and harm is not anticipated. The interview will involve discussing personal and professional experiences and should you feel you require support following this interview the confidential occupational health and counselling services of the University Health Board are available. Support from the Health Board's human resources department, the professional body (The Chartered Society of Physiotherapy) and/or another trade union could also be sought if required. Further support may be available through The All Wales Treatment Handling Group and/or The All Wales Occupational Physiotherapy Group.

Written information regarding these services and the complaints procedure will be available at the interview venue and online at the University Health Board website or the Chartered Society of Physiotherapy or other union website.

Will my taking part in this study be kept confidential?

If you decide to take part in the study your involvement will be kept confidential. Your participation will be on an "opt-in" basis and will therefore be confidential. All information from the interview will be kept strictly confidential and will be anonymised to ensure comments are not attributable to any individual

Will my GP be informed of my involvement in the study?

As this study involves an interview regarding your views on work-related spinal disorders in the physiotherapy profession there is no need to inform your GP of your participation.

What will happen to the findings of the research study?

The findings of this study will be used to create a theory about the perceived causes and prevention of work-related spinal disorders in the physiotherapy profession. A greater understanding will benefit the profession and may ultimately improve the safety of practicing physiotherapists.

The findings of the study will be presented as the thesis for the PhD, at professional meetings and conferences and if accepted, published in

journals. If interested, a copy of the published article can be made available to you. You will not be identified in any report/publication.

Who is organising and funding the research?

I am self-funding the PhD. I have been awarded part-funding for the study from the Physiotherapy Research Foundation (PRF) of the Chartered Society of Physiotherapy (CSP).

Who has reviewed the study?

This study has been reviewed by the Faculty Research Ethics and Governance Committee (FREGC) of the Faculty of Health and Social Science at the University of Brighton, by the Physiotherapy Research Fund during the funding application process and by the Research Ethics Committee (REC) for Wales.

What if I wish to lodge a complaint?

If you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of this study please contact the University of Brighton Research Governance Team on 01273 600900 ext 4184.

Contact for further information about this study:

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Tel: 01273 643653

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A.M.Benson@brighton.ac.uk
Tel: 01273 643621

This completes Part 2 - Thank you for reading this information sheet.

If you agree to take part you will be given a copy of the information sheet
and a signed consent

Appendix 4 Participant Consent Form

An exploration of perceived contributory factors and prevention of work-related spinal disorders (WSD) in the physiotherapy profession in Wales

Researcher: Philippa Coales

Please
initial box

I confirm that I have read and understand Part 1 and Part 2 of the information sheet dated 25.4.12 for the above study. I have had the opportunity to consider the information, ask questions and have had these questions answered satisfactorily.

I understand my participation is voluntary and that I am free to withdraw at any time without giving any reason without my legal rights being affected.

I understand that the interview will be audiorecorded and that this recording will not be used for commercial purposes and will be stored securely.

I understand that the interview audiorecording will be transcribed into written format and this will be stored securely for ten years in line with University of Brighton research governance guidelines.

I understand that the audiorecording will be destroyed as soon as is practicable after it has been transcribed

I understand that any confidential information will be seen only by the researchers and will not be revealed to anyone else.

I understand that direct quotes may be used in dissemination of the study but that they will remain anonymous.

I agree to take part in this study.

Name (please print)

Signature

Date

Person taking consent

Signature

Date

Appendix 5 Example of hand-written memo at conclusion of interview

7/10/00

2-1

Activity levels.

Side leave 68.

Knowledge 71, 151

Fitness - OP vs ward, 76 →

insight - family - time affected stages of insight, 10P.

Physical characteristics. 11C.

Taking care of themselves 120

The experience of OP 140

see Dick re storage & health

also consider number of OP patients vs ward.

Nature of job 152

At course first 166 → this 151X

Risk assessment 176

Equipment 180

Man ward equipment time consuming, 203 →

Ward vs OP. 215, 22

Targets 228, 242,

Charging practice 231, 264.

Past history of work, 231

Fitness to practice at entry level 253

Med 272.

Factors 279

mixed case list 281

see Clodwen

sketching. 292

Access to R & M 321

different views of OP ward?? see Clodwen.

also refer to OP vs ward? number of OP?

Appendix 7 Example of a reflexive memo

Reflective memo December 2014 following 2 pilot interviews
<p>My role as an interviewer:</p> <p>One of the aims of using pilot interviews which were videoed was to enable me to monitor my interview technique as a researcher rather than as a therapeutic interviewer.</p> <p>As an interviewer I presented an open body language inviting response and used mirroring to encourage further discussion. Verbally I used confirmation and feedback of the participants' views on regular occasions demonstrating active listening. All these factors were encouraging to me and reduced my anxiety about my performance as a research interviewer to gain deep data.</p> <p>It is apparent that I asked leading questions during Blodwen's interview which may be as a result of my own sensitivities to the topic.</p> <p>When Blodwen became upset I was able to support her adequately to reduce the stress and to continue the interview. This was in line with role of the interviewer identified in the ethics application</p>
<p>Action for future interviews:</p> <p>I need to be aware that I do not impose my own values upon the data and continue to recap and present back to the interviewee their comments for confirmation.</p>

Appendix 8 Reflections

Reflections of recruitment, interview numbers and pilot interviews

Reflections on recruitment July 2014

I found that the recruitment of participants was more difficult than I anticipated which may have been due to a number of reasons reflected below. I had received positive support from the Therapies R&D lead and there were potentially approximately 300 people in the convenience sample pool, which I had thought would make recruitment easy. I had been naive enough to believe that the Therapies R&D lead's support would filter down the chain of command. I therefore anticipated approaching managers who had been informed that the study was taking place and that it had the support of the Therapies R&D lead. This was not the case. I was therefore faced with explaining the study, from scratch, to each Clinical Service lead. Despite the Therapies R&D lead's support some Clinical Service leads refused me access to their staff thereby reducing the available potential sample. The reason universally given for this was that their staff did not have the time. At the Team lead level both similar and different issues were encountered. Although I was able to see and explain the study to at least one Team lead on all sites I was not able to meet with all Team leads at each site. As there appeared to be limited communication between team leads on each site the Team lead I had managed to see was not able to pass on the information to any other Team lead who I was unable to meet. This again reduced the participant pool. I felt that even if I had persisted in liaising with the Team leads I was unable to meet they would not have agreed as they knew the reason eg. research study, and their behaviour in avoiding me was a form of passive rejection. Those Team leads I was able to meet with had varying responses. Some said no to accessing their staff and again they gave the reason of the fact their staff didn't have the time. Again the pool size was reduced. When I got agreement to be able to attend a routine team meeting it was apparent that I was not meeting the whole team due to absences at the meeting for various reasons: seeing patients, annual and study leave, part-time working. The people to whom I was able to present the study had varying responses to it. Some were very keen to

participate but many others were less keen. On discussion the reasons given by individuals (rather than their managers) was i) they did not have time to be away from their patients ii) they considered spinal pain to be normal so did not wish to discuss it further – this second reason gives me an idea for a future study cohort. Following discussion it became apparent that the reason most gave for not having time to participate was due to a previous research study in which they had participated. A clinician in the Health Board was conducting a PhD study and had recruited from the same participant pool as I had approached a few months before I had. His study involved high levels of time commitment in terms of training, patient care, observation, recording and mentoring which was still ongoing when I was recruiting. Following this experience the people I approached were wary of entering into such a commitment as they perceived my study would involve, despite explanation that it would be a one off maximum 1 hour meeting. They also demonstrated a higher commitment to their colleague who was about to recruit for another phase of his study, than they did to me whom they may have perceived as an “outsider”.

The difficulties encountered in recruitment has made me think about how access to NHS staff for research participation can be managed to reduce “research participation apathy or burn-out”.

Reflections on number of interviews January 2014

The number required to ensure a robust study is dependent upon a variety of factors some which can be influenced by me and others over which I have no control – see reflections on recruitment. The main aim is to interview “enough” to be pretty certain of “sufficiency”. Also need to keep in mind that although sample doesn’t have to be representative I would like to try and interview people from as wide a selection of clinical areas as possible. Keep in mind that theoretically sampling from data analysis may be random and may/may not encounter issues as described in reflections on recruitment. Consider alternative approaches to accessing theoretical sampled people which would still be covered by ethical approval.

Reflections on Pilot Interviews January 2014

Pilot interviews are not necessarily used in qualitative methodologies due to the iterative nature of the process. I am an experienced physiotherapist with obvious skills in collecting data from patients through interview but the research interview is a different context about which I have no experience. I have conducted focus groups previously but I feel that this requires some different skills from the one-to-one interview used in this study. Therefore, as a new researcher with limited experience of research interviewing I felt the need to carry out some pilot interviewing with the aim of acquainting myself with the mechanics of the event.

I was able to recruit two colleagues who I was aware had experiences WSD, via direct approach and request. I felt more comfortable approaching people I knew were aware that I was doing the study and who had been exposed to some of my previous chats about how progress was going. I felt that they would be supportive of my attempts and would be happy to provide feedback on the experience in a critically appropriate but supportive way. Correspondingly I respected their views and experience and would be happy to accept the feedback.

In addition to asking them to do the pilot interview I requested that the interview was videoed. None of the interviews in the main study will be videoed so the request for the pilots was purely as another method of assessing my interviewing ability and the process as a whole. They both agreed and following the interview they confirmed, as I had felt, that the presence of the camera was forgotten.

Reflections and changes:

I was nervous about doing the interviews which I felt was partly due to knowing the 2 interviewees well as I had worked closely with them for some years. I was also aware that I wanted their experience to be positive so was anxious about the outcome. However, once it was underway the interest in the data was such that I lost my nervousness.

I had a very brief interview schedule mainly addressing the study aims. I was concerned that this limited schedule would mean that the interview would be

both brief and lack depth. On reflection I discovered that I needed to introduce the topic and the interview more clearly and succinctly and subsequently I re-wrote the introductory detail at the beginning of the interviews to set the scene more clearly. This meant that I would be more able to get the interviewee “on board” more securely and give them clear information regarding the event.

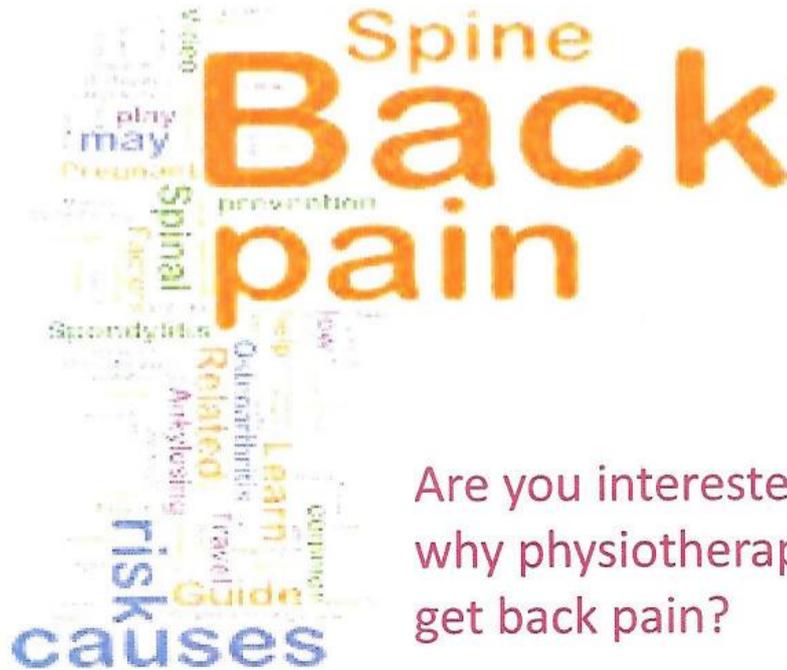
The limited number of specific questions on the schedule did not prove to limit the gathering of data. The questions were used as initial prompts and were specifically related to the study outcomes but subsequent follow-up questioning was much more wide ranging and related directly to the answers being given. The interview therefore became less structured than I had thought though I felt that I was adequately able to pursue appropriate lines of thought. At the beginning of the whole study I had been concerned that I would not be able to do this and had therefore opted to use a semi-structured interview method. On reflection this is still the right approach to ensure the study aims are addressed but I felt heartened that I could manage to develop further lines of investigation to deepen the detail without being too far side-tracked. I assume that this arises from my experience of collecting data from patients and that my fears of inability to transfer skills from one context to another were unfounded. This has given me confidence regarding the recruitment process were the study will be introduced to all staff via staff/team meetings, and for subsequent interviews.

Following analysis I became aware that it would be beneficial to know more demographic data regarding the participant and so subsequently added these basic questions into the new interview scheme (Interview Schedule V 2 19.1.14, Appendix 2). These included age, gender, date of qualification as a physiotherapist, a brief précis of their career with clinical areas and grades. Both participants discussed their home situation with regard to WSD and as that was a theme which had not previously been uncovered through the literature I decided it should be included into the schedule and a question was subsequently added. It was also noted that the open question at the end which invited any further comments, which was not actually on Interview Schedule V1, elicited some interesting data. It was therefore added

specifically to Interview Schedule V 2. It is often the case that the best data comes once the recorder is switched off so I wanted to try to gather that type of data with the open final question.

The videos of the two interviews were analysed by the participants as well as myself. They and I were surprised at how swiftly the camera was forgotten but this did not change my views that subsequent interviews would not be videoed as the data from the two videos added little to the audio recording. Voice timbre and changes etc were captured well on audio and the value of the video was simply to confirm the appropriateness of the interview technique and environment. This identified that the layout of the room could be more relaxed if a low coffee table height table was used in preference to a desk height table. It is necessary to have something upon which to put the audio recorder so a low table will be used subsequently to encourage openness between interviewer and interviewee and to reduce as many barriers as possible. As an interviewer I presented an open body language inviting response and used mirroring to encourage further discussion. Verbally I used confirmation and feedback of the participants' views on regular occasions demonstrating active listening. All these factors were encouraging to me and reduced my anxiety about my performance as a research interviewer to gain deep data.

Appendix 9 Recruitment Information Poster



Are you interested in why physiotherapists get back pain?

Would you be interested in discussing the causes and prevention of back pain in physiotherapists

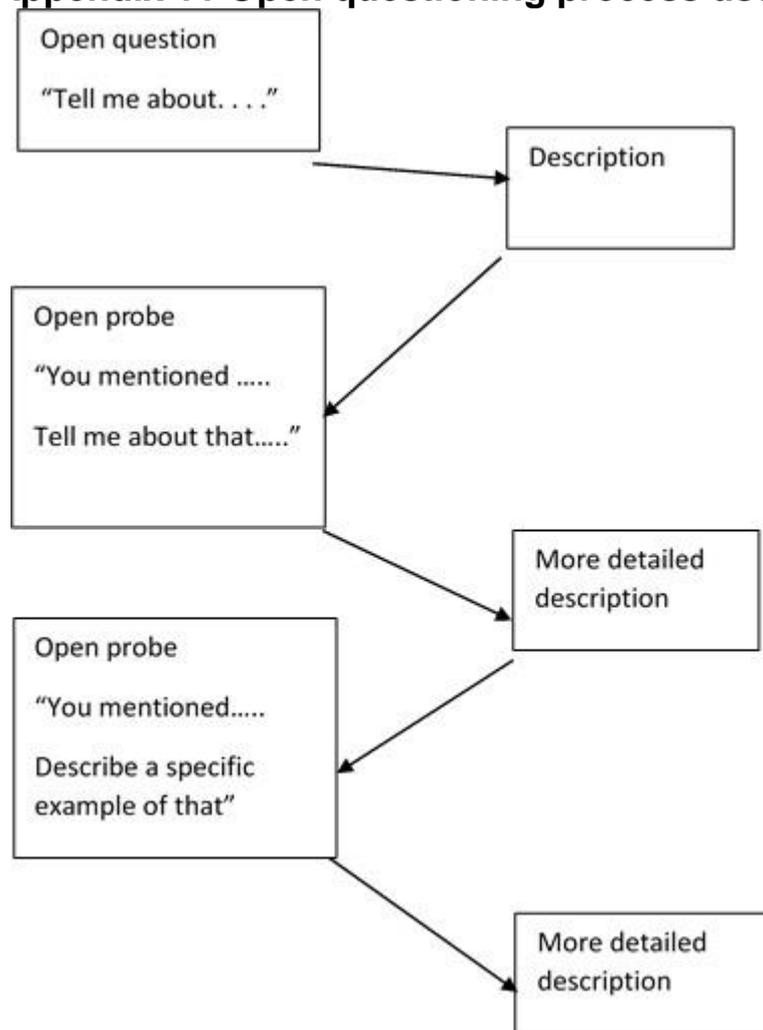
Come along to hear Philippa Coales explain her PhD study and request participants to discuss their views

Date:
Time:
Venue

Appendix 10 Participation form

Name	Email address	Mobile phone number	Preferred contact method	Willing to participate? Y/N	Experienced spinal pain? Y/N

Appendix 11 Open questioning process used in interviews



TAKEN FROM ROULSTON (2010)

Appendix 13 Transcription annotation system

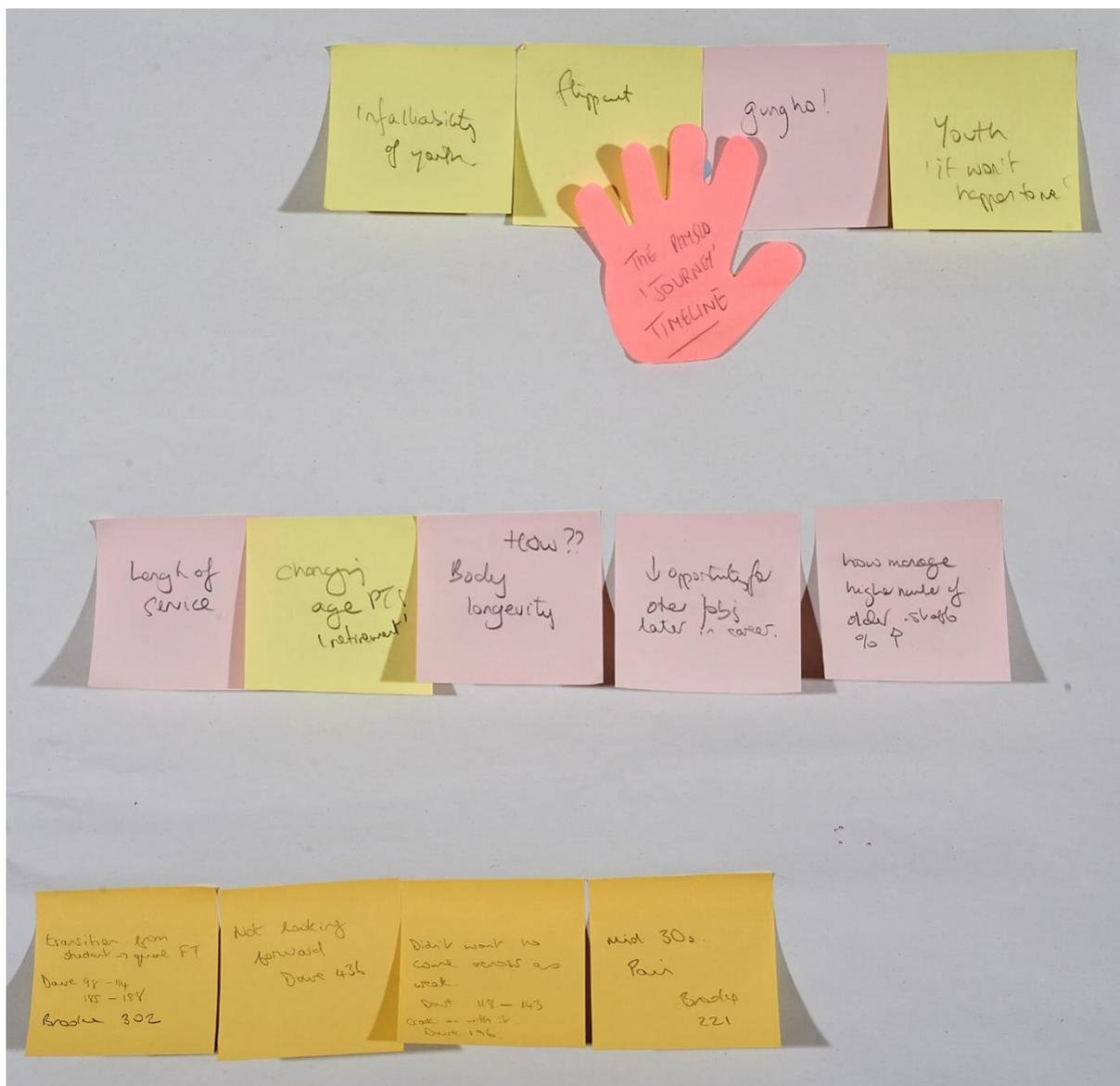
Table 1

Feature	Notation and Explanation of Use
The identity of the speaker; turn-taking in talk.	Pseudonym denotes the participant. PC denotes the researcher.
Pseudonyms	“name” indicates that a pseudonym has been used.
Trailing off and pausing. indicates that the speaker paused or did not finish their sentence or their speech trailed off.
Identifying information	Words in square brackets [], explain what or who the speaker was referring to.
Punctuation	Used to enhance the ability to read the transcript and accurately reflected the meaning of the sentence. Question marks were used to note the rising intonation of a question and commas to signal a slight pause but with the intonation of continuing speech.
Reported speech	Inverted commas were used to indicate where a person was providing an apparent verbatim account of speech, or thoughts of themselves or another.

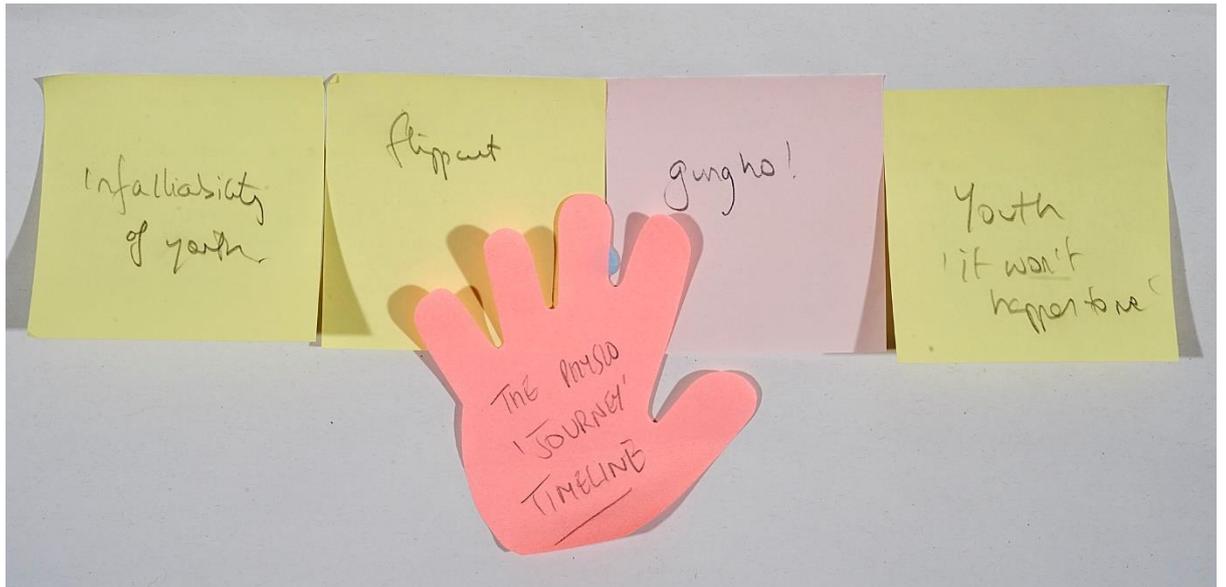
Table 2 Additional notation systems used by external transcriber

Feature	Notation and explanation of use	System suggested by (PC) or (HW)
Identity of speaker	Bold and coloured font for the interviewee (each interviewee was allocated a different colour) Un-bold black font for the researcher	PC
Fluency of speech	Change of sentence midway through speaking identified by /	HW
Audibility	Inaudibility or uncertainty indicated with the time it appears in the recording (03:15)	HW

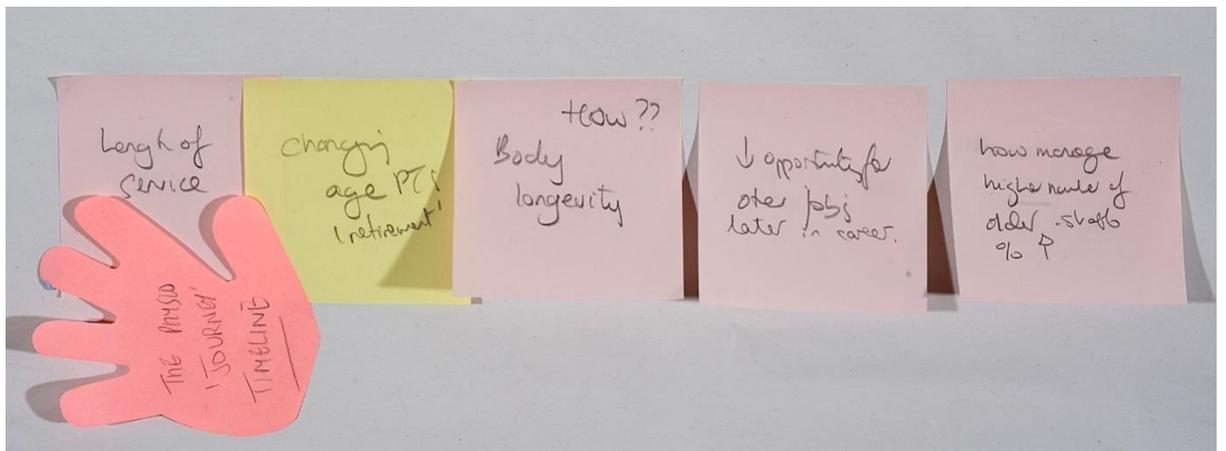
Appendix 14 Example of final data analysis chart
 Example of final data analysis chart - Theme 3 Individual, factor
 Physiotherapists' career timeline



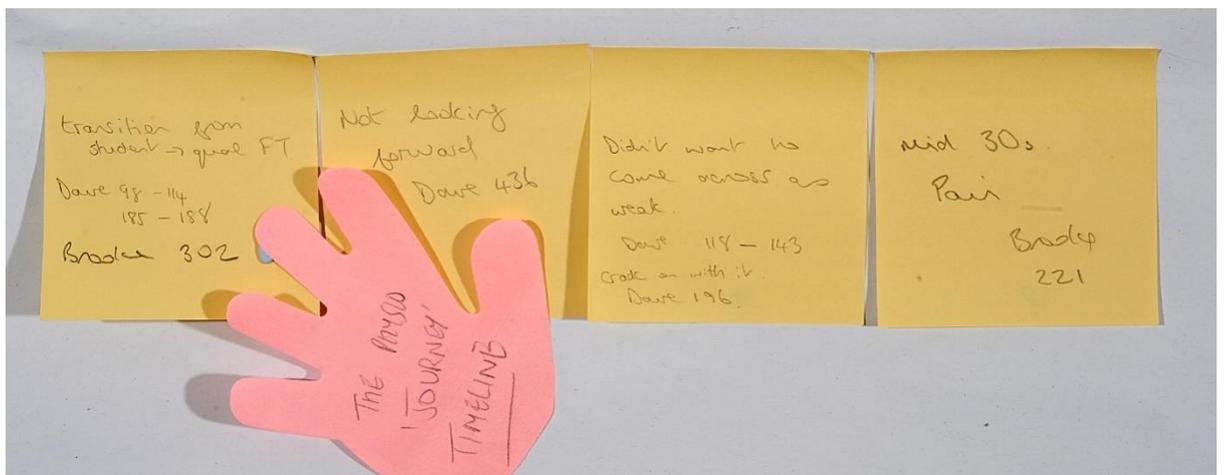
EXAMPLE OF COMPLETE CHART FOR ONE FACTOR - PHYSIOTHERAPISTS' CAREER TIMELINE



CLOSE UP OF CHART FOR CLARITY



CLOSE UP OF CHART FOR CLARITY



CLOSE UP OF CHART FOR CLARITY

Appendix 15 Dissemination Strategy

Presentations

Physiotherapists' perceptions of contributory and risk reduction factors for work-related spinal disorders in the profession Chartered Society of Physiotherapy Conference, Birmingham UK, Nov 2017

All Wales presentations and discussions

All Wales Treatment Handling Group – presentation of study and discussion on modification of risk assessment “traffic light” system. September 2017

All Wales Occupational Health Physiotherapy Group – presentation of study and discussion on strategies to raise profile of WSD in work places. September 2017

All Wales Physiotherapy Managers Group - presentation of study and discussion on strategies to raise profile of WSD in work places and on management strategies for early career and rotational physiotherapists. November 2017

Welsh Board of Chartered Society of Physiotherapy - presentation of study and discussion on strategies to raise profile of WSD in work places. March 2018

Welsh Government

CSP Public Affairs & Policy Manager for Wales (Pip Ford) – discussions on raising profile of physiotherapy WSD with Welsh Government. March 2018

Chief Therapies Advisor to Welsh Government (Ruth Crowder) - discussions on raising profile of WSD with Welsh Government. August 2018

Cardiff University

Presentation of study to School of Healthcare Sciences and discussions on strategies to raise profile of WSD in pre-registration education resulting in implementation of changes in Manual Handling Training delivered to physiotherapy, occupational therapy, radiography and operating department practitioner pre-registration programmes from 2018 cohort. Incorporation of strategies to embed safe practice, manual handling and risk assessment awareness in to BSc (Hons) physiotherapy programme documentation for revalidation of programme 2019 cohort.

Articles

Proposed articles:

The Mixer Theory – a new theory of risk factors for WSD in physiotherapists

The perceptions of PTs with experience of WSD on WSD risk factors in early career

The perceptions of PTs with experience of WSD on the value of risk assessment and mandatory manual handling training

Predictive journals – Physiotherapy, Physiotherapy Research International,
Physiotherapy Theory and Practice, Ergonomics, Ergonomics for Therapists