

Levels and methods of stakeholder engagement in the management of work related musculoskeletal disorders; A systematic scoping review.

Abstract:

Aim: Stakeholders have an important role in both prevention and management of work related musculoskeletal disorders (WRMSDs). However, the scope of practice is unclear regarding the methods and levels of stakeholder engagement (SE) in management of WRMSDs. The aim of this review is to map the literature regarding various methods and levels of SE and how it is best implemented when managing WRMSDs. Methods: A systematic literature search was conducted in several major databases using key search phrases. Various methods and levels of SE in management of WRMSDs were extracted. Comprehensiveness and repeatability of the SE methods were evaluated. The final results on SE in WRMSDs were presented as per the Guidance for Reporting Involvement of Patients and Public (GRIPP-2) guidelines. Results: A total of 32 studies reported various methods and levels of SE in management of WRMSDs. Two distinct areas, namely prevention (n=14) and primary management of WRMSDs (n=18) were reported. Overall, 17 unique methods of SE in management of WRMSDs were presented. A total of 30 studies gave sufficient information for either full (n=9) or partial (=21) replication of methods of SE. Only a few studies (n=6) involved higher levels of SE in management of WRMSDs. Conclusion: A clear mapping of SE in management of WRMSDs was presented for effective involvement of stakeholders in WRMSDs policies and care plan. SE approaches in WRMSDs management should move forward from a tokenistic approach of engaging stakeholders and it should involve them in a more lead roles in the future.

Background

Work related musculoskeletal disorders (WRMSD) impose a significant public health burden occurring in 60% of the population annually (HSE 2019) and account for 37% - 38% of all work-related disorders (OSHA 2019). WRMSD are defined as impairments of bodily

structures such as muscles, joints, tendons, ligaments, nerves and bones caused or aggravated primarily by the work itself or by the environment in which work is implemented” (Nunes 2009). They are commonly associated with symptoms including discomfort and pain, but can result in disability or weakness in severe cases (Chagas 2017). High prevalence and the potentially severe nature of WRMSD incurs a significant direct cost in the form of healthcare provision (OSHA 2010), or indirect cost due to economic loss such as workplace absenteeism (OSHA 2010). While the full extent of economic burden is unknown, work-related upper limb disorders alone contribute 2% of Gross National Product spending (OSHA 2010). Stakeholders’ engagement and involvement in the management of WRMSD is very important as it will make healthcare services and related policies efficient.

Stakeholder engagement (SE) is an iterative process of actively soliciting the knowledge, experience, judgment and values of individuals selected to represent a broad range of direct interests in a particular issue, for the dual purposes of creating a shared understanding; and making relevant, transparent and effective decisions (Deverka 2012). Stakeholders are either an individual or a group who is responsible for or affected by healthcare and healthcare-related decisions (Concannon 2012), and this definition encompasses both providers and recipients of care (Beneciuk 2020). In the current review, SE refers to iterative contribution and solicitation of knowledge, experience and values by patients, carers, family members, members of the public, healthcare, clinical, or social care workers, policy makers, organisations, or workplace managers involved in managing WRMSD. SE in the work place interventions has been reported to minimize workplace risk factors, reduce the prevalence of musculoskeletal pain and decrease pain intensity in both prevention and primary management of WRMSD (Williams 2004, Hoe 2018). Direct costs are also reduced, as stakeholders have a greater knowledge of WRMSD management options, allowing them to take sustainable, independent action in managing them (Johnston 2013, Mishra 2018)

SE in healthcare is a dynamic process that requires complex methods of engagement (Miakel-Lye 2016, Tousignant-Laflamme 2017). The methods of SE is an active process which involves a participation and shared understanding between the targeted end users and stakeholders (Grande 2014, Alkhaldi 2015, Kim 2018). In the current review, the methods of SE are defined as tools, strategies or interventions that encourage active participation and shared understanding between various stakeholders involved in the management of WRMSD. The methods of SE are effective when the patients and stakeholders work together to focus on patient identified priorities and to inform practice based on patient related outcomes (Amirav 2017, Bombard 2018, Kim 2018). The levels of SE are referred to a model of a continuum in which the patients and stakeholders are engaged in research and health care engagement across six levels namely learn/inform, participate, consult, involve, collaborate and lead/support (Amirav 2017).

Despite the above said importance of SE in health care and the highlighted benefits of SE in the WRMSD, till date, no reviews have attempted to summarize the various methods and levels of SE in the management of WRMSD. Therefore, the current review focuses to create an evidence map on the various methods and levels of SE in the management of WRMSD reported in the literature. The main aims of this review are 1) to summarize key study characteristics of the studies which involve SE in WRMSD and 2) to determine various levels and methods of SE in the management of WRMSD. The evidence map would assist healthcare providers and organisations to understand the evidence-based approaches on various levels and methods of SE, which could be implemented in setting up a delivery of care when managing the WRMSD. It might also assist policy makers, researchers and organisations seeking to establish guidelines for developing further methods of stakeholder engagement in the WRMSD interventions.

Main Text:

Methods

This review was designed according to Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) (Shamseer 2015), developed as per the scoping review methodological framework and conducted following the Arksey and O'Malley scoping review guidelines (Arksey 2005). The script was reported in accordance with Guidance for Reporting Involvement of Patients and Public (GRIPP-2) (Staniszewska 2017).

Eligibility Criteria.

Eligibility criteria were developed with reference to operational definitions used for stakeholders (Concannon 2012), stakeholder engagement (Deverka 2012) and WRMSD (Nunes 2009). Studies were included if they 1) used any qualitative or quantitative scientific study design (e.g. Narrative, phenomenological, ethnography, grounded theory, case studies, descriptive, correlational, quasi-experimental or experimental designs); 2) were published between January 1995 and May 2020; 3) included a complete abstract; 4) were available in full text; 5) were published in English or English translation; 5) focused on any stakeholders engagement or involvement (e.g. healthcare, clinical or social care workers, policy makers, organisations, workplace managers, patients, carers, family member or members of the public); 6) sought to implement, analyse, describe or quantify the process of SE; 7) focused on any acute or chronic WRMSD (e.g. musculoskeletal; pain, conditions, complaint, symptoms, injury or disease) 8) focused on any setting where stakeholders were engaged in the management of WRMSD (e.g. Inpatient wards, rehabilitation centres, outpatient departments, community, and workplaces).

Studies were excluded if they 1) used non-scientific study designs (e.g. protocols, commentaries, reports, or expert opinions); 2) were not available in full text following attempts to access them through library services; 3) were not available in full text after a two-week response period following a direct contact with authors requesting full access; 4) targeted musculoskeletal disorders not associated with work activity or environment; 5) did not focus on WRMSD or differentiate between WRMSD and other work related disorders (e.g. Work-related mental health disorders, work-related cancer, work-related skin disease or work-related disease from biological agents) 6) focused on "sick listed" workers where reasons for "sick listing" were unreported or not associated with WRMSD.

Information Sources

An electronic search of several databases was conducted to identify studies meeting eligibility criteria. Databases searched were PubMed, AMED (OVID), EMBASE (OVID), Medline (OVID), CINAHL (EBSCOhost), Cochrane Review database, and Joanna Briggs Institute database (JBI). Gray literature was sourced from Google Scholar, International Standard Randomized Controlled Trial Number (ISRCTN) registry, Open Gray, and screening bibliographies of studies meeting inclusion criteria.

Search strategy

An original search strategy consisting of five main search terms was developed which includes stakeholder, engagement, work, musculoskeletal and disorder. The five main search terms and their synonyms/component MeSH terms were identified using assistance from MeSH term database, library services, expert academics, and previous protocols or reviews using similar search terms (Deverka 2012, Pollock 2017, Petkovic 2020). Synonyms/component MeSH terms were grouped under the corresponding main search term with the Boolean operator "OR", with each main search term separated with the Boolean

operator "AND". An initial search strategy was developed on PubMed using an iterative process of testing and refining main search terms. The synonyms/component of MeSH terms of the key search phrases were used in other database. The complete search strategy for the study is available in the supplementary file 1.

Screening process

Search results were exported to Endnote x9 desktop, where they were screened and managed. The screening process was managed by two researchers and it consisted of five stages 1) manual removal of duplicates 2) screening titles for eligibility criteria; 3) screening abstracts for eligibility criteria; 4) screening full texts for eligibility criteria; 5) screening bibliographies of included studies for additional relevant studies.

Appraisal of repeatability of methods of engagement.

The appraisal of repeatability of methods of engagement among the included studies was conducted using a rudimentary "traffic light" system (Pollock 2018). This system categorized the repeatability of the methods of engagement as "red", "amber" or "green" in the context of stakeholder engagement in healthcare research design. It defined repeatability on whether the degree or quality of information given by studies enables full (green), partial (amber) or no replication (red) of methods of engagement used. Thus, the repeatability of methods of engagement among the studies were presented as "red", "amber" or "green" traffic light system to report the methods of SE in the management of WRMSD.

Data extraction

Data was extracted into two original standardised forms, designed with the intention of capturing key information pertinent to the outlined aims of the review. The key characteristic information retrieved from the studies included source (publication, authors and date), study design, setting, participant age, occupation, targeted disorder, and stage of care

(prevention or primary). Further, additional details such as the targeted stakeholders, description of methods of engagement and levels of engagement mentioned in the studies were also extracted.

Data synthesis

The method of SE engagement reported among the studies were presented through a narrative description. This description intended to document all unique methods of engagement used by studies and reported each unique method of SE engagement across the studies. Following this, cross tabulation was used to document the levels of engagement in each study. A continuum of engagement model using six levels of engagements namely learn/inform, participate, consult, involve, collaborate, lead/support levels of engagement were used in this review to evaluate the levels of engagement (Amirav 2017). The methods of engagement used in the included studies were then reported under one or more of the levels of engagement based on the information provided in the study. This information was used to identify trends and gaps in methods of engagement and their included levels of engagement. Where studies did not provide enough information to describe methods and levels of engagement used, they were recorded as "not described in detail".

Results

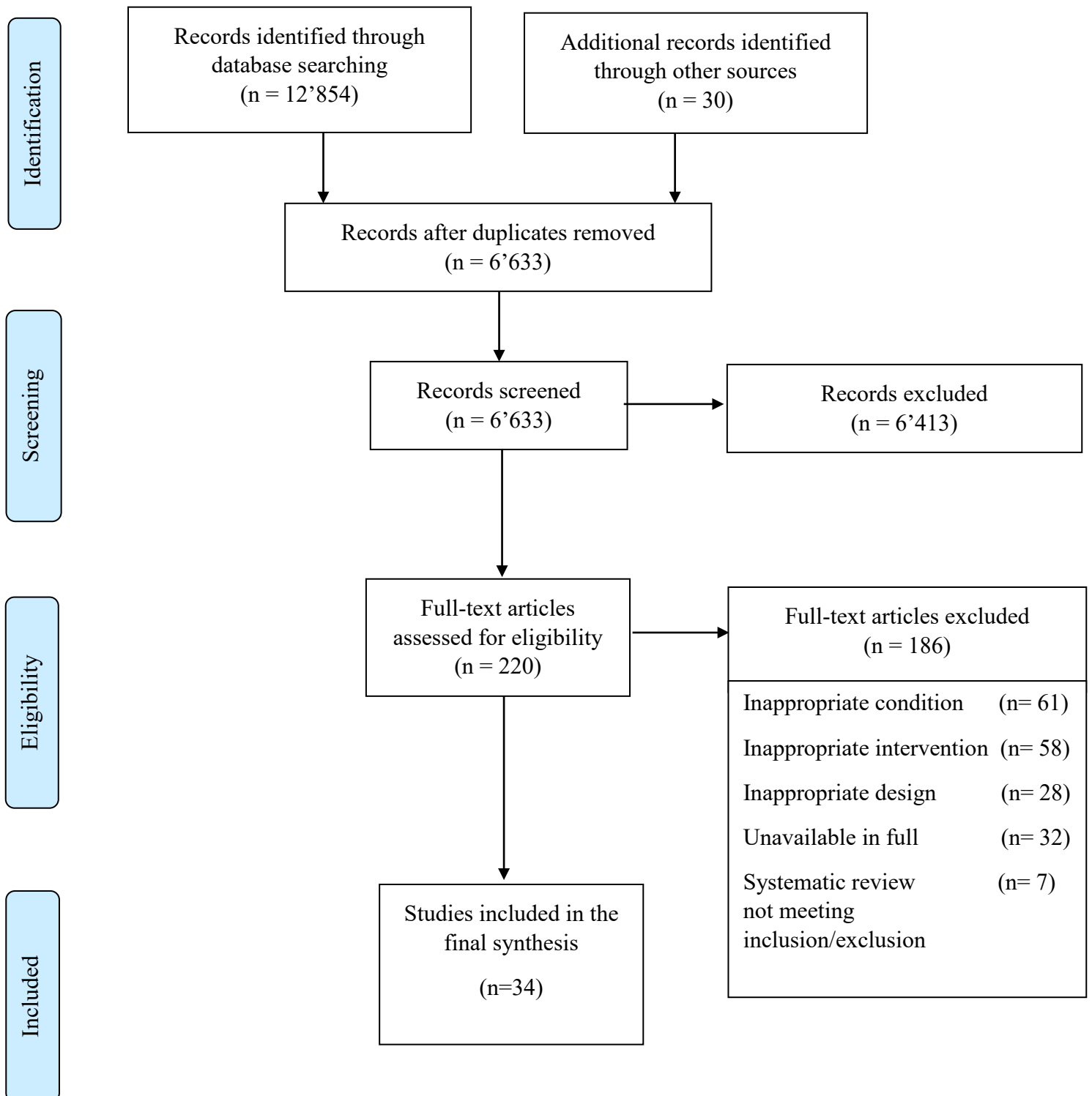


Figure 1. Summary of results from literature search.

Key study characteristics.

Key characteristics for all the 34 included studies are presented in Table 1. The majority of the studies (N=27, 79%) on the SE in WRMSD were published between 2006 and 2020. Most studies focused on common WRMSDs including lower back (n=12, 35%), upper extremity (n=5,15%) or shoulder regions (n=2, 6%). The total number of studies that reported SE in the WRMSD looked into two distinct areas of management, which include prevention (n=14, 41%) and primary management (n=18, 53%). A large number of studies sought quantitative data (n=30, 88%) with 2 studies using a mixed methodology.

Methods and levels of engagement,

The results on the various methods and levels of engagement were presented in Table 2. A total of 17 unique methods of SE were identified across the 32 included studies. The predominant method of engagement used was education (n=18), in the form of non-interactive group sessions (Ludewig 2003, Rivilis 2006, Speklé 2010, Mahmud 2011, Mongini 2012, Lowe 2017), interactive group sessions (Haldorsen 1997, Bohr 2000, Haukka 2008, Bernaards 2011, Motamedzade 2011, Dale 2016, Rasmussen 2016, Font 2019), pamphlets (Hazard 2000, Soares 2012, Murray 2017), web education (Murray 2017) and one-one sessions (de Jong 2012). Educational sessions were mostly one session, however, the length of sessions varied from one hour to one day. Identification of stakeholder values and experiences (n=15) through meetings/consultations was heavily used as another method of engagement. The number of meetings ranged between one and three, with one study setting a maximum of 26 meetings (Anema 2007). Meeting was either clinician led or collaboratively led between worker, managers, organisations and/or clinicians. Values and experience elicited in clinician led meetings included workplace risk factors (Loisel 2001, Lambeek 2009, Jensen 2011, Mahmud 2011, Jensen 2012, Coole 2013, Sennehed 2018, Bird 2020),

worker beliefs on return-to-work timelines (Lambeek 2010), worker rehabilitation goals (de Jong 2012) or multidisciplinary team rehabilitation goals (Lambeek 2009, Lambeek 2010). Collaboratively led meetings only focused on identification and management of workplace risk factors (Bohr 2000, Loisel 2001, Anema 2007, Haukka 2008, Driessen 2011, Jensen 2011, Jensen 2012, Dale 2016, Rasmussen 2016, Hansen 2019, Bird 2020). The remaining methods used were worker led: graded workplace exposure; (Steensra 2006), workplace alteration (Bohr 2000, Rivilis 2006, Font 2019) exercise following education (Murray 2017) and feedback on management options (Loisel 2001).

The appraisal of the methods of engagement were presented in the Table 3. A total of 30 studies gave sufficient information for either full (green, n=9) or partial (amber, n=21) replication of methods of engagement. When summarising levels of engagement, only few studies involved the use of the lead/support (n=5) or consultation levels (n=1). The focus was evenly divided between the remaining four levels. In addition, few studies (n=12) used methods of engagement consisting of two or more levels (Bohr 2000, Loisel 2001, Rivilis 2006, Haukka 2008, de Jong 2012, Jensen 2012, Hutting 2015, Dale 2016, Rasmussen 2016, Murray 2017, Font 2019, Wynne-Jones 2018).

Discussion

The present review used robust scoping review methodology to create an evidence map of SE and how it is implemented in the management of WRMSD. The concept of stakeholder engagement in the management of musculoskeletal disorders is highly recommended and an emerging trend of research approach as it is beneficial to the quality, relevance and impact of health research (INVOLVE 2013, Kreis 2013). Sustained Model of Assessment and Rehabilitation Training (SMART Drive) network is an international group of researchers and experts in the field of occupational health and WRMSD (Joseph 2020, Joseph 2021). Engaging end users and stakeholders in health service research informs patient and provider education and policies along with improving service delivery and governance (Bombard 2018). In spite of several studies highlighting the importance of incorporating SE in the WRMSD health research and services, the studies are generally dispersed and there is a paucity in the synthesis of evidence on the methods and levels of SE in WRMSDs. In addition, scoping reviews are suggested to identify trends and gaps in research that is complex or heterogenous (Arksey 2005, Bragge 2012, Bailey 2014), Thus, the SMART Drive conducted this scoping review to explore various mechanisms of SE to implement different ways of stakeholders' involvement in WRMSD towards establishing a sustainable research and care plan to manage WRMSD. The findings of the review showed that there were vast heterogeneity in methods and levels of SE reported in WRMSD. The different methods and levels of SE in WRMSD identified in this review might provide information to policy makers, researchers, and organisations in establishing guidelines for engaging stakeholders in WRMSDs care and research agenda. As the SMART Drive network group is currently engaging with various stakeholders as part of developing a comprehensive care and related policies to manage WRMSD in a group of professional drivers (Kasemsan, 2021, Sattasuk,

2021), the findings of the study have direct implications in terms of implementing the methods and levels of SE identified in the current review.

The characteristics of the studies that reported SE in WRMSD showed some interesting findings. Out of the total 32 studies that reported SE in WRMSD, it was noteworthy to mention that 28 studies were either carried out or reported from the high-income countries such as the United Kingdom, The United States and European nations. Only 4 studies were reported from low- and middle-income nations raising some serious questions on the importance of the awareness, understanding, reporting and application of SE driven research and care plan in the management of WRMSD. A recent document by the World Health Organization published in the year 2020 has highlighted five groups of factors that affects patient engagement in care provision (WHO 2020). These factors include patients' perception of their role in care, health literacy, demographic characteristics, attitudes and beliefs of the health professionals and severe illness conditions. In low- and middle-income countries, patient and public engagement in research is limited due to gaps in health infrastructure, socioeconomic status, cultural stigma, uncertain roles and perhaps, poor reporting standards of SE in scientific publications (Cook 2019, Janic 2020). On the other hand, establishing strategic national and international research partnerships, initiatives to combat stigma, and sensitization and training of stakeholders in patient engagement in research were proposed as recommended solutions to promote SE in research among low- and middle-income nations (Janic 2020). Thus, one of the overall aims of the SMART Drive network group is to promote awareness, understanding, application and reporting of SE driven research and care plan in management of WRMSD in the developing nations. For example, the SMART network group has been engaged in advocating SE in WRMSD in the low- and middle-income nations through training of the local academics-general community-stakeholders, establishing active collaborations and peer to peer support in mentoring SE

approach in local research settings. Therefore, the current review is a part of the overall plan to explore SE approaches in the WRMSD which will provide a roadmap to the researchers and stakeholders to actively construct SE approaches in the WRMSD projects.

The findings from overall study characteristics showed that there were only two qualitative studies which had explored SE approach in WRMSD. While the lived experience of the patients with illness such as WRMSD, perspectives of the stakeholders and patients on WRMSD health care services, awareness of the community on WRMSD were all generally qualitative paradigms, it was surprising that very few studies had qualitatively investigated the SE approaches in WRMSD. The findings suggested that there was a lack of understanding of the experience and perceptions of SE approaches in WRMSD. Further studies are warranted to explore the attitudes, beliefs and views about SE in the management of WRMSD. SE is an inherently stakeholder driven concept with its success relying on active partnership and the solicitation of the ideas and values between stakeholders involved in care (Bird 2020, Olsson 2020). Perhaps, practicing reflexivity and listening to the stakeholders during the stages of research engagement, collaboration with patients and stakeholders, conduct of the research process, creation of management strategies and overall project evaluation could be some of the potential areas where qualitative approach might be relevant and applicable regarding SE in WRMSD. Lastly, the findings from study characteristics also showed that the SE in WRMSD were generally reported among studies which were either intervention and prevention in nature. While there are no identified reports in this review about the SE approach in WRMSD during the assessment, the SMART drive network suggests the SE approach can be applicable and is appropriate during the stages of evaluation and monitoring of WRMSD.

A vast heterogeneity was noted in this review regarding the methods of engagement as a total of 17 unique methods of the SE in WRMSD were reported among the studies (Table 2).

This vast heterogeneity in methods of engagement is a common trend reported across healthcare research summarising SE (Mockford 2011, Kim 2018). On the other hand, the appraisal on the methods of engagement presented in Table 3 showed that almost 30 studies reported sufficient information on the SE methods that it could be sufficiently reproduced. Thus, the review findings on the various SE methods may be useful to anyone who plans to develop and apply SE in WRMSD research and care plan. The findings on the levels of engagement showed that only 6 studies had reported deeper, meaningful levels of SE in the WRMSD. With only 6 studies engaged stakeholders in the leading and consultation levels, most of the levels of engagement were generally tokenistic in nature. A recent review on SE in medication safety also showed similar results with lower levels of engagement employed among studies on SE (Kim 2018). The review reported lower levels of SE such as inform/educate were employed more frequently when compared with higher levels such as lead/support where stakeholders played an active role (Kim 2018). In addition, only few studies (n=12) used SE that involved more than two or more levels of engagement (Bohr 2000, Loisel 2001, Rivilis 2006, Haukka 2008, Jenssen 2011, de Jong 2012, Jensen 2012, Dale 2016, Rasmussen 2016, Murray 2017, Wynne-Jones 2018, Font 2019), despite the World Health Organisation recognising SE in healthcare as a dynamic multi-faceted process (WHO 2020). Future studies focussing on SE in WRMSD should consider multiple levels of engagement from stakeholders as it might contribute to an active participation approach towards ownership and leadership of research and care agenda in WRMSD. As the current review did not address the effects of the SE in WRMSD outcomes, it was not known at this point of time whether SE in WRMSD could have any desirable positive effects. Therefore, further studies are warranted to evaluate the effects and impacts of SE in the management of WRMSD.

Implications

The findings of current review provide scientific evidence with both practical and theoretical implication for SE in the management in WRMSD. The practical implications were the identification of 17 evidence base methods of engagement that could be employed by health care professions and organisation in the set up or implementation of WRMSD care. Theoretical implications includes that the findings presented in this review have added to the growing body of research highlighting the heterogenous and tokenistic nature of SE in healthcare. Other theoretical implications include creation of an evidence map identifying gaps and opportunities in the current research of SE in WRMSDs. These gaps might be exploited by policy makers, researchers, and organisation to overcome the current heterogenous and tokenistic nature of SE in WRMSD. The key gaps and opportunities identified are the need to: 1) develop and foster higher levels of SE in WRMSD particularly consultation and lead/performance roles; 2) develop complex methods and levels of engagement in WRMSD research and care plan and 3) employ qualitative study designs to describe lived experiences and needs when being engaged or engaging stakeholders in the management of WRMSD.

Strengths and weaknesses.

The review acknowledges some limitations. One of the limitations was that the current review included articles only in the English language and hence, there were possibilities that the studies could have been missed out from other languages. The concept of SE in the interventions started to gain attention among researchers only from the late 1990s. Thus, the current review searched the literature from the year 1995. It might be possible that some of the oldest studies before 1995 might have been left out from the current review. Another limitation of the review was that it did not report the effects and impacts of SE in WRMSD. Thus, the application of the review findings could not be fully embraced without an understanding on the effects of the SE approach in WRMSDs research and care plan. The

strength of this review was that it created a robust methodology building on limitations noted in previous scoping reviews in summarising SE. This included the use of an evidence-based model to map levels of engagement, strict adherence to scientific reporting guidelines, as well as broad eligibility criteria and search strategies designed to capture all pertinent information for the topic on SE in WRMSD.

Conclusion

In summary, the evidence map presented in this review identifies 17 evidence-based methods of engagement that could be used to engage stakeholders in the WRMSD research and care planning. The findings of this review highlighted the need for policy makers and researchers to investigate less tokenistic, more complex methods of engagement. Also, the review calls for building a qualitative understanding of stakeholders lived experiences when being engaged or engaging others in the management of WRMSD.

List of abbreviations

(WRMSD) – work related musculoskeletal disorders

(SE)- stakeholders engagement

(PRISMA-P) - Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols

(GRIPP-2) - Guidance for Reporting Involvement of Patients and Public

(MeSH) – Medical subject headings

(SMART Drive) - Sustained Model of Assessment and Rehabilitation Training.

Declarations

Ethics approval and consent to participate:

Ethical approval and consent to participate for this review is not applicable.

Consent for publication:

Not applicable

Availability of data and materials:

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request

Conflict of interest:

The authors declare that they have no conflict of interest.

Funding:

No funding support is available for this study

Authors' contributions:

JF, LJ, LV, PS, AP and UP contributed to the design and methodology. JF, LJ and LV and PS prepared the main body of the manuscript. PS, AP and UP commented on and reviewed drafts of the pre-publication document. JF, LJ and LV provided the illustrations. The author(s) read and approved the final manuscript.

Acknowledgements:

A special thanks to the 'SMART Drive International Network' research partners from various Countries for the sincere support and contribution to the project.

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