

Abstract

Work disability due to low back pain is a significant global health concern. Current policy and practice aimed at tackling this problem is largely informed by the biopsychosocial model. Resultant interventions have demonstrated some small-scale success, but they have not created a widespread decrease in work disability. This may be explained by the under-representation of the less measurable aspects in the biopsychosocial evidence base; namely the influence of relevant systems. Thus, a 'best-evidence' synthesis was conducted to collate the evidence on how compensatory (worker's compensation and disability benefits), healthcare and family systems (spouse/partner/close others) can act as obstacles to work participation for those with low back pain. Systematic searches of several scientific and grey literature sources were conducted, resulting in 1,762 records. Following a systematic exclusion process, 57 articles were selected and the evidence was assessed using a system adapted from previous large-scale policy reviews conducted in this field. Results indicated how specific features of relevant systems could act as obstacles to individual efforts/interventions aimed at tackling work disability due to LBP. These findings reinforce the need for a 'whole-systems' approach, with all key players onside and have implications for the revision of current biopsychosocial-informed policy and practice.

Introduction

Work disability due to low back pain (LBP) causes more global disability than any other condition [1]. In the United States (US) indirect costs of LBP are estimated to be more than US \$50 billion per year, in the United Kingdom (UK) US \$11 billion and in the Netherlands almost US \$5 billion [2]. This burden is accounted for by approximately 10 percent of individuals with LBP, but the multi-factorial nature of work disability makes it very difficult to identify and thus prevent [3] [4, 5]. Research over the last two decades aimed at tackling this issue has shown that personal and occupational psychosocial variables play a more important role than spinal pathology or physical job demands; work disability due to LBP is now widely accepted to be a biopsychosocial phenomenon [4, 6-12].

The biopsychosocial model was developed in recognition that biological, psychological and social factors, and the interactions between them, can influence the course and outcome of any illness [13]. The approach was first introduced by Engel in 1977 [14] who stressed that the subjective experience of illness must be taken into account. The model proposes a dynamic systems approach, rather than one of linear causality or a factor-analytical approach as represented by the medical model. It also represents a shift of focus away from disease only, highlighting the importance of the illness trajectory in presenting opportunities to reduce/prevent disability. Although the International Classification of Functioning, Disability and Health (ICF) [15] acknowledges both the medical and social perspectives, it applies largely to individuals with impairments [16]. However, illness has many of the characteristics of a complex system, whereby dynamic interactions produce new properties and effects. Thus, the biopsychosocial model is particularly salient for understanding work disability due to LBP, which is now widely accepted to be the result of a trajectory of interactions between the individual and their social context [17, 18].

This understanding is reflected in the latest policy and clinical guidance for the management of LBP, which promotes early self-management and a continuation, or early resumption of, normal activities including work [19, 20]. However, the biopsychosocial evidence is dominated by research focusing on individual risk factors, despite the conception of the biopsychosocial model as a 'whole-systems' approach with all dimensions being equally important for work disability due to LBP [21]. Thus, resultant interventions are largely aimed at tackling unhelpful beliefs and behaviours, and whilst they have demonstrated some important successes, these are small-scale and have not created a widespread decrease in LBP disability [22]. Such individualised approaches to managing health conditions have been critiqued by not adequately taking into account the power that wider, systemic influences exert on individual will [23]. Yet research examining the non-modifiable

influences operating outside an individual's perception and control, which cannot be adequately addressed by clinical and vocational rehabilitation interventions, is under-represented in the biopsychosocial evidence base [24] [25].

This issue reflects the perennial philosophical debate around the relative roles of structure and agency as they influence health [26]. The agency argument posits that health is influenced by the individual's ability to act on decisions that arise from a unique self [27]. The structuralist view defines health as a product of context, and examines contextual factors that may impinge on individual behaviour, for example advice given by healthcare professionals [28]. To date, the biopsychosocial evidence in relation to work disability due to LBP appears to largely reflect the agency perspective, and has led to individualised interventions that are suboptimal.

In order to try and redress this imbalance in the biopsychosocial evidence base, this study provides a first attempt at collating and appraising the existing literature examining how relevant systems can act as obstacles to work participation for individuals with LBP. These systems are: compensatory (worker's compensation and disability benefits – covering interactions with the workplace system), healthcare and family (spouse/partner/'significant others') systems. Findings will have implications for the revision of current biopsychosocial policy and practice aimed at tackling work disability due to LBP.

Method

A 'best-evidence' synthesis was conducted. This was deemed the most appropriate method acknowledging that literature on the chosen subject is under-represented in the empirical evidence, and would be rather disparate and thus unfit for a systematic review [29]. A best-evidence synthesis gathers a range of academic (background and primary research, quantitative and qualitative) and grey literature available on the selected topic [30, 31], and draws conclusions about the balance of evidence based on its quality, quantity and consistency – it sets the results in context. This broad and inclusive method is particularly appropriate in order to capture the wide range of policies, practices, cultural tenets, and legislation in several different countries and settings. It also aligns to the methodology that has been successfully applied in relevant large-scale policy reviews which currently underpin the evidence base in this field [32-36].

The search strategy was compiled in an iterative process using both established MESH terms and keywords from the authors' expert knowledge of the field. Although the primary focus of the review

was work participation and LBP, search terms related to other non-specific musculoskeletal conditions were also included as this evidence was deemed highly relevant to the study objectives. This is supported by the evidence which indicates that sub-grouping by non-specific musculoskeletal condition is unhelpful [37], especially when work participation is the outcome [36]. Conversely, it was decided that material relating to unemployed populations would be excluded because there is evidence that risk factors for work disability differ depending on employment status [4]. The included systems were identified as ‘compensatory’ (worker’s compensation and disability benefits), ‘healthcare’ and ‘family’ (spouse/partner/‘significant others’)) due to their proposed importance as key stakeholders in the work participation process for those with LBP, but which had been under-researched [7, 38].

MESH terms and keywords, e.g. “Back Pain” or “Low Back Pain” and “Sick leave” or “Sickness absence” or “Absenteeism” or “Return to work”, and “Worker’s compensation” or “Sick benefits” /and “Healthcare professionals” or “Family Physicians” or “Health personnel” /and “Spouse” or “Social support” or “Significant others” were combined by Boolean operators (AND/OR/NOT), and various combinations within each category were attempted in each database so as not to miss any relevant sources. The searches were conducted in PubMed, CINAHL, EMBASE, PsychINFO, Scopus, Web of Science, Cochrane Library, ProQuest, Google Scholar and OpenGrey databases in December 2013. In order to maximise the chances of ensuring all relevant evidence was included across a range of disparate sources, no time limits were applied. However, only the evidence in English, Danish, Norwegian, and Swedish was selected due to the language comprehension of the authors. In addition to our systematic searches, we also included material recommended by experts within the field and a few additional evidence sources from weekly database alerts or authors coming across new publications were added concurrently until July 2014.

Evidence grading

A rigorous, yet pragmatic system was used to grade the available evidence (adapted from Waddell & Burton, 2006 [35] – see Table 1) whereby the grade refers to both the amount and quality of the evidence, indicating its ‘strength’. Due to the disparate nature of available evidence, it was not appropriate to apply a formal method of quality assessment to each article, and for the purposes of this study, quality was largely attributed to academic peer-reviewed published articles.

[Table 1 here]

Results

After removing duplicates, 1,762 records were retrieved. Initial title and abstract screens were conducted by one of the authors, the results of which were then discussed and agreed upon by all authors in an iterative process. Of these, further abstract/summary screenings were then undertaken by two of the authors independently, and 57 articles were finally selected for data extraction (see Figure 1).

[Figure 1 here]

Information from the included articles was summarised and examined [see attached supplementary material section for evidence tables], and findings are presented primarily in the form of evidence statements. These were developed, refined and agreed by the authors in an iterative process until consensus was reached. Each evidence statement was graded according to the nature and amount of relating evidence (see Table 1), and explicitly linked to the source(s) of this evidence. Evidence statements for each of the systems are presented as follows:

Compensatory systems

Evidence Statement 1:

**** There is limited evidence to suggest that receiving worker's compensation/disability benefit in itself, is an obstacle to work participation [39-44]***

A critical review on this subject found that studies varied greatly in terms of methodology and design, with many having obvious flaws or shortcomings. [42]. Another review study indicated that some people view compensatory systems as a safety net that may reduce their perceived capacity, but this was regardless of health condition or not [44]. Thus, it was concluded that it was not possible to determine whether an association exists. For example, it was reported in one study that individuals had a significantly increased risk of prolonged claims if they had filed a worker's compensation claim within 12 weeks of pain onset, therefore arguing for a negative effect of receiving worker's compensation itself [39]. However, this effect was worse for those experiencing neck pain compared to LBP, and this difference was not explained. Similarly, another study reported a significant increase in return-to-work for non-compensated injured workers compared to compensated workers receiving functional restoration treatment, but this difference had diminished at 6 months [41]. In contrast, another study reported that receiving worker's compensation did not affect time to return to work [43], and another found bi-directional effects depending on an individual's health locus of control (the perceived level of control over own health condition). In

contrast to what one would expect, those workers reporting that the course of their pain was out of their control were more inclined to return to work compared to individuals who reported to be more in control [40].

Evidence statement 2

***** *There is robust evidence to suggest that specific, unhelpful characteristics of compensatory systems are obstacles to work participation [45-60]***

A wide range of studies contributed to this evidence statement, resulting in three common characteristics described as potential obstacles to work participation:

- 1) A strict and rigid compensatory system in terms of access to benefits and employment/modified work or worker's compensation. The evidence here indicated that eligibility criteria should be less strict for long-term and/or partial disability benefits [53], but schemes providing widespread easy access to compensation were shown to discourage work participation, suggesting that unlimited compensation may have adverse effects [56, 58]. The presence of problematic rules and practices of the system, and of employers working against important initiatives like modified duties were emphasised [47, 50, 51, 60], and the rules and regulations of labour unions and compensators were specifically cited. It was reported that initiatives involving income insecurity during return-to-work are potential obstacles by reducing peoples' incentives to engage in such initiatives [45, 46]. These were specifically described as comprising low benefit rates during re-education, a reduction in benefits when having some degree of work, and income uncertainty when trying to find a new job.
- 2) Specific elements of the compensatory system concerning regulation and conduct, such as right to case appeal, decision-making when medical uncertainty, or slow/dissatisfactory case management. There were some common features reported that seem to reward people for continued disability. For example, the access to an appeals process encourages an increase in labelling people as disabled because this achieves greater financial rewards. Furthermore, it was proposed that worker's compensation/disability benefits relying on medical certainty complicate and prolong claims as individuals may be required to change course, be under constant medical treatment, and face defending their legitimacy through a cycle of claim denials and appeals [50, 51, 57]. Studies exploring the perspective of the claimant suggest that slow systems influence work disability directly or indirectly because they lead to a longer duration of work absence [5, 45, 49, 52, 59].
- 3) Regulations concerning the size of wage compensation rates following compensation claims. High wage compensation rates following injury claims were reported as an influence on work disability by increasing absence duration [48, 50, 55, 56]. Although one of the studies concluded that age and employer size were stronger predictive factors of prolonged absence than wage compensation rates

[55], another did report a significant 1.6-increased risk of continued work absence for those receiving high compared to low wage compensation rates [48]. Wage compensation rates approaching or exceeding work wages were reported as a disincentive to work participation following injury claims [50], and that earnings-related compensation resulted in a slower exit of the compensatory system [56].

Healthcare systems

Evidence Statement 3

****** There is robust evidence to suggest that a lack of work-focused healthcare (i.e. a failure by healthcare professionals to address work issues within the clinical encounter) is an obstacle to work participation [47, 61-81]***

Addressing work issues in the clinical encounter was defined as talking to the worker and the employer, posing questions and giving advice to the patient about work accommodation/date for return-to-work and prevention of re-injury, and referral to other relevant healthcare professionals. All except one of the studies relating to this evidence statement concluded that addressing work participation as a part of the clinical encounter would have a positive effect – the other study found that this effect disappeared when injury and workload characteristics were included in the analysis-model [61]. Reasons for not addressing work issues were most often reported as healthcare professionals not generally regarding engagement in work issues within their professional remit [66-70, 80]. Some of the reasons for this are proposed to include a lack of financial incentive [73, 74], a lack of time and standard procedures/role clarity, and increasing job demands [70, 73]. Some of the evidence indicated that healthcare professionals do not adhere to guidelines and give advice to (over)rest and take an unnecessarily long time off work [47, 79, 81]. It was suggested in one study that this was because healthcare professionals do not believe guidelines to be valid and therefore are unlikely to apply them [76]. In this vein, it was also reported that healthcare professionals' distress about the complexity of LBP and their own 'incorrect' beliefs about LBP could be an indirect determinant for advising sickness absence and not engaging in discussions about work participation [66, 75, 78]. A seemingly important aspect was the difficulty healthcare practitioners reported with finding a balance between being a patient advocate and also gate-keeper of sickness absence certification. Many of the studies conducted in the countries where this kind of system is in place indicate that healthcare professionals allow a high degree of patient influence on their decision

making about sickness certification in order to preserve the patient-practitioner relationship [65, 71, 72, 77].

Evidence Statement 4

***** There is robust evidence to suggest that a lack of communication/cooperation between the healthcare system and other relevant stakeholders (e.g. employer, compensatory system) is an obstacle to work participation [44, 47, 63, 65, 80, 82-86]**

A lack of communication or loss of contact between relevant stakeholders [47, 80, 84, 85], poor communication skills, poorly communicated (and coordinated) work participation activities among stakeholders [82], and unidirectional communication between stakeholders [83] were specifically cited as influences on work participation for those with LBP. The evidence suggested that by improving communication between the healthcare system and other relevant stakeholders, workflow obstacles (time delays from incorrect or slow procedures) are seemingly reduced [80, 82]. In principle, additional issues such as conflicting demands from stakeholders [44] and lack of trust [80] can also be addressed. According to some of the evidence, a lack of common goals [47, 65], structural barriers, societal norms, healthcare professionals' desire to maintain the professional status quo [83], and healthcare professionals being unaccustomed with involving others in their practice [44, 65] were proposed to act as barriers to communication. Where the effects of systematic cooperation between employer, occupational health service and social insurance office have been tested, a significantly immediate and sustainable effect on work participation (6 years) was found, but healthcare professionals highlighted difficulties due to "LBP patients' inexhaustible needs for healthcare" [86].

Despite a general consensus among the studies that communication between the healthcare system and other relevant stakeholders was important, one study questioned the independent effects of this collaboration because they found that specific aspects of communication with healthcare professionals were more significant predictors for work disability [63]. Giving a patient a return-to-work date, and guidance on how to prevent recurrence and re-injury were each positively associated with work participation in this study. Furthermore, although healthcare professional contact with the workplace was found to be associated with work participation, this association became weaker upon adjusting for other variables (e.g. socio-demographic and job characteristics, pain duration and co-morbidity).

Evidence Statement 5

**** There is adequate evidence to suggest that a lack of access to suitable and satisfactory health care is an obstacle to work participation [56, 87, 88]**

Two of the studies relating to this evidence statement were based on workers' perspectives, who cited geographic barriers to appropriate and timely care, and/or access issues related to workers' "claimant status" (adding an extra administrative burden, reducing consultation time) [56], and satisfaction in terms of perceived quality of health care [87]. However, this latter study reported that an injured workers' satisfaction with their employer's treatment of their disability claim was more important compared to satisfaction with healthcare. Healthcare provided by the employer was reported to be important because it was suggested that not having access to health insurance, which provides easy access to healthcare, is an obstacle to work participation [88].

Family systems (significant others)

Evidence Statement 6

**** There is adequate evidence to suggest that a lack of appropriate support from significant others is an obstacle to work participation [89-91]**

Receiving support from significant others was considered to be an important factor for continued work participation for those with LBP, but the included evidence indicates that this is a complex interpersonal issue. For example, it was reported in one study that emotional support (availability of affectionately close and deep emotional relationships) increases self-appraisal and boosts self-esteem in individuals with LBP, but also encourages continued absence from work [89]. Another study reported that lack of support and distrust from significant others acted as an obstacle to return-to-work in persons absent from work due to LBP [90], and another found that solicitous behaviour from a partner increases disability levels among individuals with back pain [91]. Solicitousness was defined as getting the person in pain to rest, and taking over their jobs and duties.

Evidence Statement 7

*** There is limited evidence to suggest that the beliefs of a significant others are an obstacle to work participation [6, 92-94]**

An evidence-informed guidance document reported that negative beliefs, fears and expectations about work from a spouse/relative might serve as obstacles for work participation [6]. In addition, three small qualitative studies reported that significant others seem to share the negative illness

perceptions of their sick-absent family members, thereby indicating a likely detrimental influence. However, none of the studies investigated if these beliefs directly affected work participation [92-94].

Discussion

For almost two decades, a 'whole-systems' approach to tackling work disability due to LBP has been called for [60, 82]. This was reiterated more recently by The International Labour Organization (ILO) who strongly recommended that 'enhanced social protection' should be a key objective in the work disability research field [95]. Despite this, evidence examining the influence of wider influences has been lacking, i.e. the 'social' component of the biopsychosocial evidence base. The findings of this study make a valuable contribution to this evidence base, documenting how specific features of key (but under-researched) systems can act as obstacles to individual efforts/interventions aimed at tackling work disability due to LBP.

To illustrate this, we found limited and inconsistent evidence to suggest that receiving workers compensation/disability benefit in itself was an influence on work participation for those with LBP. Although there is some evidence to suggest that receiving worker's compensation negatively influences recovery and vocational outcomes, largely due to the notion of 'secondary gains', the populations concerned are outside the remit of this review [96-98]. Moreover, a recent critical narrative review has dismissed such studies as biased because individuals with risk factors for work disability are over-represented among workers who file compensation claims [99]. Rather, it appears that a particularly important aspect is the timing of receipt of compensation/benefits in terms of making the transition less financially stressful. Regulations fostering employers and unions to indirectly discourage work participation are unhelpful - employers and unions need to convey that work participation is mostly the best outcome for the affected worker, providing that the job quality is good [35].

Lack of access to benefits during return-to-work, re-education or job transition were also identified as important influences - as was a claim being dependent on medical certainty or having access to an appeal process. Such regulations necessitate an open claim which prolongs and also reinforces disability; the evidence points to improved management of these processes. Again, this presents a challenge because non-modifiable factors, such as unemployment rates and the business cycle would need to be taken into account. Indeed, findings from an ecological study indicate that claim rate decrease in recessionary periods when unemployment increases [100]. Thus, our findings point

to the need for a 'flexible' compensation/benefits system with regulations that allow for adaptations related to the individual, the workplace and the business cycle.

The evidence also pointed to other salient issues such as lack of role clarity for relevant personnel, poor coordination of return-to-work activities, lack of knowledge and understanding of standard procedures, poor communication, and conflicting demands from other stakeholders. These factors were shown to result in slow or dissatisfactory case management, which in turn was suggested to prolong claims and delay return-to-work. In order to remove such barriers, the Organisation for Economic Co-operation and Development (OECD) has provided recommendations which result in financial stimuli for the relevant stakeholders (e.g. workplace, healthcare) to better collaborate. Such recommendations have been implemented in several European countries, and have been associated with significant reductions in sickness absence and disability claims for LBP [101]. More comparable studies need to be conducted, but the cultural and financial cross-country differences mean that this would be a significant undertaking. Such obstacles may explain the relatively lower number of studies focused on disability benefit/social security systems compared with worker's compensation systems found in this review. Further research in this area is needed, and would provide a more nuanced understanding of how such systems affect work outcomes in populations with differing legislation, cultural norms, and socio-demographic statuses.

Moving onto the healthcare system, this review pointed to two particularly important process aspects: the *practice behaviours* of healthcare professionals and *timely access* to healthcare. Here, 'practice behaviours' refer to what healthcare professionals say and do to address work issues, communication and cooperation with the patient and relevant stakeholders (employer, compensation system, other healthcare professionals), and the patient-practitioner relationship. Robust evidence was found to suggest that failure to address work issues within the clinical encounter is an obstacle to work participation for those with LBP. The healthcare system is often the first point of contact for individuals with LBP, and it may also be the gatekeeper to other systems such as welfare and compensation. Healthcare professionals therefore, are in a prime position to administer the latest evidence-based guidance, which has recently called for healthcare to become more 'work-focused' [19] – that is, for healthcare professionals to take an interest in, and accept responsibility for, addressing obstacles to work participation in the clinical encounter. However, there is only sparse and conflicting evidence demonstrating the successful implementation of such guidance and its resultant effects on improving rates of LBP disability [102].

It is clear that further resources are needed to assist healthcare professionals to engage in work discussions with LBP patients, which can often be complex and challenging. For example, evidence shows that many individuals with LBP expect treatment to result in a significant reduction or complete removal of pain in order for it to be considered successful and for them to be able to work [103]. These unrealistic expectations and misconceptions are a difficult issue for healthcare professionals to manage, and often result in the use of practices that are not recommended and which can delay return-to-work, such as referral for imagery [104]. Such practices have also been proposed to result from misconceptions by healthcare professionals themselves about the work-health relationship [105]. However, the evidence in this study revealed a more nuanced and complex picture, and it would seem that in order to address non-adherence to guidelines, multidimensional initiatives and implementation strategies such as decision support systems; multilevel educational strategies; reminder systems; clinical practice audits; and regulatory change such as incentives to increased communication would be beneficial. Actions to ease the administrative burden on healthcare professionals to improve certain issues like time pressure, and access to proper assessment tools and communication platforms would also be helpful [106].

Findings also highlighted how the healthcare system acts a crucial stakeholder among various other important systems (e.g. the workplace and compensation/insurance systems). Thus, removing procedures that increase stakeholder conflict also appears to be of key importance. This is because healthcare practices that are unhelpful for the return-to-work process are often further reinforced by compensation and welfare systems requiring a medical diagnosis for a condition that most often does not have an equivalent pathology [107]. In the evidence reviewed, healthcare professionals described their cooperation with other stakeholders as unclear, scarce and often initiated late in the process. It was reported that healthcare professionals are generally not accustomed to initiating contact with other relevant stakeholders, and therefore it appears important to further promote a widespread understanding of the positive link between work and health amongst these stakeholders. Altering working procedures to include both relevant incentives and mandatory engagement and cooperation with other stakeholders, as well as improving the transparency and consistency of the return-to-work process is also required.

The other aspect revealed in this area of the evidence to be an obstacle to work participation was a lack of access to suitable and satisfactory healthcare, i.e. having access to work-focused healthcare at the right time. The retrieved studies indicated that lack of access was often due to simple geography or eligibility criteria related to 'claimant status', but a lack of health insurance through

the employer was also highlighted. Affordability has been identified as significant gap in health system coverage, and it is a problematic barrier in the context of most social welfare systems where equal access to health care is an overriding goal and principle [108]. One solution to these access barriers could be more provision of workplace 'onsite' healthcare, as supported in an international policy review which emphasized the value of investing in appropriate employee healthcare [109]. A way of increasing this is to legislate employers' obligations to offer (suitable work-focused) healthcare to their workers the same way employers are already subject to legislation concerning workers' safety. However, this would increase the financial pressure on smaller organizations, which may result in an adverse effect on worker well-being. This could be accommodated, however, by introducing tax exemptions related to workplace size or earnings/public budgets.

Another option would be if workplace healthcare access is considered a welfare task, and then it would be necessary to consider applying a more public health model providing case management and multidisciplinary support in the early stages of sickness absence, available to all. However, in order to create such a model, pilot studies testing the right construction of elements must be conducted. An example of this is the 'Fit for Work Service' introduced by the UK government [19]. The model proposes that when an employee has been absent from work for 4 weeks or more, the general practitioner (GP) refers the employee to an occupational health professional with the purpose of identifying individual obstacles for work participation and developing a plan containing recommendations and information on where to get appropriate help and advice. Employees, employers, and GPs also have access to advice from a phone line or website – this method of service provision is evidence-informed [33]. By introducing an additional tax exemption per year for each employee recommended to Fit for Work or an employer-arranged occupational health service, these are examples of how Government can influence a systemic and cultural shift in embedding work as a health outcome.

The final system proposed to be an important influence on work participation for those with LBP was the family system, or 'significant others'. Although, it is widely acknowledged that interaction with spouses/family members is an important factor for recovery from pain, this was the most under-researched area compared with the other two systems in this review. A range of policy and empirical evidence has stressed the need to acknowledge the role of family members in order to improve health and work outcomes [110-115], but work participation is rarely the outcome in studies of this nature. Furthermore, data is rarely collected from family members themselves – it is either collected

from individuals with pain reporting their own perceptions of their family member's beliefs and behaviours, or family member behaviours are observed and reported by a researcher or clinician.

Despite this, we found adequate evidence to suggest that a lack of appropriate support from the SOs of those with LBP influences their work participation. In this field, unhelpful support has largely been documented as solicitousness or punishment [116-118], and helpful support as empathic and positive responses [119-121]. However, the literature suggests that complexity can arise when this support or empathic response, viewed by couples as an indicator of relationship strength, translates into solicitousness which has a potentially detrimental effect [122, 123]. It has also been suggested that by providing help with everyday tasks, significant others are reducing the amount of activities for the person with pain, leaving more time for them to focus/ruminate on their condition. Furthermore, accepting this support may lead to the individual with pain to feel they are losing autonomy, thereby reducing their capacity to develop sustainable coping strategies. Conversely, providing (and describing) support may allow significant others to fulfil their 'normal' role as a caring family member in the face of an 'abnormal' situation [124].

This research illustrates the complexities which can arise due to the differing needs of those experiencing LBP and those close to them. The studies included in this review did not investigate such complexities, but our findings usefully point to areas warranting further investigation and highlight issues of practical concern in such research. Findings also indicate the potential of harnessing support from family members in order to improve work participation outcomes for those with LBP. This notion draws on the theory of 'salutogenesis' [125], which is in contrast to much of the research in this field which focuses on the negative or unhelpful factors involved. Indeed, it has been suggested that this 'deficit' approach may disproportionately lead to policies and practices which disempower those who are supposed to benefit from them by ignoring existing capabilities and capacities operating at an individual, group, community, population and institutional level that are protective or health promoting [126].

Study limitations

Compared with a systematic review, the method of 'best-evidence' synthesis inevitably involves a greater degree of judgement about article inclusion/exclusion, how the data were extracted, how evidence statements were developed and how the evidence was graded. While having to take much of the evidence at face-value, the significance of the various sources of data was weighted by virtue of its provenance. However, it is acknowledged that some relevant sources of international evidence

may have been missed due to the language comprehension of the authors. Such findings are more open to interpretation, particularly where studies were included due to relevance, and not only because they examined causal relationships with work participation. In order to minimise the risk of bias, the authors adhered to processes similarly applied in a systematic review, and described the process as explicitly as possible. However, it is acknowledged that the method is very inclusive and does not control bias as well as a full systematic methodology would allow, so the potential for bias is accepted.

Nevertheless, where pragmatic answers are needed to guide international policy and practice, we align with previous assertions that a broad and inclusive approach is needed [127]. This is because work disability research is 'real-world', social research and if a formal systematic review methodology was applied, then many relevant studies answering more pragmatic questions about non-clinical influences on work disability would not be selected [33, 128]. Acknowledging the importance of work participation for the health and wellbeing of so many individuals with LBP worldwide, we argue for a re-think of current hierarchies of study methodology that continue to exclude both the conduct and extraction of valuable, meaningful research demonstrating good work outcomes (or the potential of them).

This argument also applies to the use and acceptance of the biopsychosocial model in the field of work disability. The model has been criticised as failing to provide a more aetiological explanation as to which variables are the most salient, and whether these variables have equal weighting across all work-relevant health conditions and work participation statuses [129]. Indeed, the rationale informing this study was largely based on the acknowledgement that the biopsychosocial model has overemphasized individual, modifiable risk factors at the expense of other less amenable aspects. However, it is important to state that the biopsychosocial model is a process rather than a causal model, acknowledging that most illness is multi-dimensional. Thus, the salience of relevant factors may fluctuate at any given point, and this temporal aspect is a particularly prominent feature of work disability due to LBP [21]. Therefore, attempting to provide a fixed 'weighting' or 'value' to these factors would likely continue to obscure the 'whole-systems' nature of the problem.

This also lends itself to the view that work-relevant health conditions need to be understood and addressed using highly-specialised knowledge. Such an approach requires a high level of dependence on health and welfare services which will become unsustainable as the population (and workforce) ages [125]. It may be more helpful to appraise the different factors in terms of whether

they are amenable to individualised interventions delivered in the short-term, and those that require modifying at a policy level to effect culture change over a longer-term. This view would help shape our understanding that individual risk factors should be addressed as products of cultural and systemic structures that contribute directly or indirectly to work disability due to LBP [130]. Researching more of these upstream issues would hopefully inform the development of more accurate policy and practice, enabling all 'key players' to work together [131].

Conclusion

The findings of this study point to specific recommendations for the revision of biopsychosocial-informed policy and practice aimed at tackling work disability due to LBP:

- ***integrating compensatory and health systems*** to ensure individuals have access to what's needed, when it's needed, in a way which is personalised to their circumstances and needs;
- ***embedding work as a health outcome*** to stimulate all healthcare professionals to implement work-focused healthcare, and to promote the need for high quality occupational health provision, which will likely require changes in the educational curriculum;
- ***ensuring a consolidation and standardisation of data collection around work participation*** to facilitate future workforce planning and capacity requirements: these data will also facilitate a better understanding of what works for whom, when, and at what cost;
- ***promoting the positive health benefits of work at a societal level*** using a public health approach involving all 'key players'.

References

1. Hoy D, March L, Brooks P, Blyth F, Woolf A, Bain C, et al. The global burden of low back pain: estimates from the Global Burden of Disease 2010 study. *Ann Rheum Dis*. 2014;73:968-74.
2. Streenstra IA, Munhall C, Irvin E, Oranye N, Passmore S, Van Eerd D, et al. Systematic review of prognostic factors for return to work in workers with sub acute and chronic low back pain. *J Occup Rehabil*. 2016 (doi:10.1007/s10926-016-9666-x).
3. Tveito T, Halvorsen A, Lauvalien V, Eriksen H. Room for everyone in working life? 10% of employees - 82% of the sickness absence. *Norsk Epidemiologi*. 2002;12:63-8.
4. Waddell G, Burton AK, Main CJ. Screening to identify people at risk of long-term incapacity for work: a conceptual and scientific review. London: Royal Society of Medicine Press; 2003.
5. Schultz I, Crook J, Berkowitz J, Milner R, Meloche G. Predicting return to work after low back injury using the psychosocial risk for occupational disability instrument: a validation study. *J Occup Rehabil*. 2005;15:365-76.
6. Kendall N, Linton S, Main C. Guide to assessing psychosocial yellow flags in acute low back pain: risk factors for long-term disability and work loss. Wellington, New Zealand: Accident

- Rehabilitation & Compensation Insurance Corporation of New Zealand and the National Health Committee; 1997.
7. Main CJ, Burton AK. Economic and occupational influences on pain and disability. In: Main CJ, Spanswick CC, editors. Pain management: an interdisciplinary approach. Edinburgh: Churchill Livingstone; 2000.
 8. Linton SJ. Occupational psychological factors increase the risk for back pain: a systematic review. *J Occup Rehabil.* 2001;11:53-66.
 9. Waddell G. The epidemiology of low back pain. The back pain revolution. Edinburgh: Churchill Livingstone; 2004. p. 27-44.
 10. Hartvigsen J, Lings S, Leboeuf-Y de C, Bakketeig L. Psychosocial factors at work in relation to low back pain and consequences of low back pain: a systematic, critical review of prospective cohort studies. *Occup Environ Med.* 2004;61:e2.
 11. Shaw W, van der Windt D, Main C, Loisel P, Linton S. Decade of the Flags Working Group. Early patient screening and intervention to address individual level occupational factors ('blue flags') in back disability. *J Occup Rehabil.* 2009;19:64-80.
 12. Nicholas M, Linton S, Watson P, Main C. 'Decade of the Flags' working group. Early identification and management of psychological risk factors (Yellow Flags) in patients with low back pain: a reappraisal. *Physical Therapy.* 2011;91:737-53.
 13. Waddell G, Aylward M. Models of disability applied to common health problems. London: Royal Society of Medicine; 2010.
 14. Engel G. The need for a new medical model: a challenge for biomedicine. *Science.* 1977;196:129-36.
 15. WHO. International Classification of Functioning, Disability and Health. Geneva: World Health Organisation; 2001 [cited. Available from: <http://www.who.int/classifications/icf/en/index.html>].
 16. Masala C, Petretto D. From disablement to enablement: conceptual models of disability in the 20th century. *Disabil Rehabil.* 2008;30:1233-44.
 17. Schultz I, Stowell AW, Feuerstein M, Gatchel R. Models of Return to Work for Musculoskeletal Disorders. *J Occup Rehabil.* 2007;17:327-52.
 18. Buck R, Wynne-Jones G, Varnava A, Main CJ, Phillips CJ. Working with Musculoskeletal Pain. *Reviews in Pain.* 2009;3:6-10.
 19. DWP/DH. Improving lives: work, health and disability. London: Department for Work & Pensions/Department of Health; 2016.
 20. NICE. Low back pain and sciatica in over 16s: assessment and management. London: National Institute for Health and Care Excellence; 2016.
 21. Schultz I, Crook J, Fraser K, Joy PW. Models of diagnosis and rehabilitation in musculoskeletal pain-related occupational disability. *J Occup Rehabil.* 2000;10:271-93.
 22. Froud R, Patterson S, Eldridge S, Seale C, Pincus T, Rajendran D, et al. A systematic review and meta-synthesis of the impact of low back pain on people's lives. *BMC Musculoskeletal Disorders.* 2014;15:50.
 23. Ong B, Rogers A, Kennedy A, Bower P, Sanders T, Morden A, et al. Behaviour change and social blinkers? The role of sociology in trials of self-management behaviour in chronic conditions. *Sociology of Health & Illness.* 2014;36:226-38.
 24. White M, Wagner S, Schultz I, Murrayd E, Bradley S, Hsuf V, et al. Non-modifiable worker and workplace risk factors contributing to workplace absence: A stakeholder-centred synthesis of systematic reviews. *Work.* 2015;52:353-73.
 25. Schultz I, Law A, Cruikshank L. Prediction of occupational disability from psychological and neuropsychological evidence in forensic context. *International Journal of Law and Psychiatry.* 2016;49:183-96.
 26. Choby A, Clark A. Improving health: structure and agency in health interventions. *Nursing Philosophy.* 2014;15:89-101.

27. Gershon I. Neoliberal agency. *Current Anthropology*. 2011;52:537-55.
28. Blankenship K, Friedman S, Dworkin S, Mantell J. Structural interventions: concepts, challenges and opportunities for research. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*. 2006;83:59-72.
29. Slavin R. Best-evidence synthesis: an intelligent alternative to meta-analysis. *J Clin Epidemiol*. 1995;48:9-18.
30. Silverstein R, Julnes G, Nolan R. What policymakers need and must demand from research regarding the employment rate of persons with disabilities. *Behav Sci Law*. 2005;23:399-448.
31. Goldsmith M, Bankhead C, Austoker J. Synthesising quantitative and qualitative research in evidence based patient information. *J Epidemiol Community Health*. 2007;61:262-70.
32. Burton A, Kendall N, Pearce B, Birrell L, Bainbridge L. *Management of upper limb disorders and the biopsychosocial model*. London: HSE Books; 2008.
33. Burton AK, Kendall N, S M, P D. *Telephonic support to facilitate return-to-work: what works, how, and when?* London: Department for Work and Pensions; 2013.
34. Waddell G, Burton AK. *Concepts of rehabilitation for the management of common health problems*. Norwich: TSO; 2004.
35. Waddell G, Burton AK. *Is work good for your health?* London: The Stationery Office; 2006.
36. Waddell G, Burton AK, Kendall N. *Vocational rehabilitation: what works, for whom, and when?* London: TSO; 2008.
37. Foster N, Mullis R, Hill J, Lewis M, Whitehurst D, Doyle C, et al. Effect of stratified care for low back pain in family practice (IMPACT Back): a prospective population-based sequential comparison. *Ann Fam Med*. 2014;12:102-11.
38. Main CJ, Parker H. Social and cultural influences on pain and disability. In: Main CJ, Spanswick CC, editors. *Pain Management: an interdisciplinary approach*. Edinburgh: Churchill Livingstone; 2000. p. 43-61.
39. Hestbaek L, Rasmussen C, Leboeuf-Y de C. Financial compensation and vocational recovery: a prospective study of secondary care neck and back patients. *Scand J Rheumatol*. 2009;38:481-7.
40. Gallagher R, Williams R, Skelly J, et al. Worker's compensation and return to work in low back pain. *Pain*. 1995;61:299-307.
41. Tollison D. Compensation status as a predictor of outcome in non-surgically treated low back injury. *South Med J*. 1993;86:1206-9.
42. Merrill A. Worker's compensation, litigation, and employment factors in return to work. *Work*. 1997;9:245-53.
43. Hadler N, Carey T, Garrett J, and the North Carolina Back Pain Project. The influence of indemnification by the worker's compensation insurance on recovery from acute backache. *Spine*. 1995;20:2710-15.
44. Werner E, Cote P. Low back pain and determinants of sickness absence. *Eur J Gen Pract*. 2009;15:74-9.
45. Magnussen L, Nielsen S, Raheim M. Barriers against returning to work - as perceived by pensioners with back pain: a focus group based qualitative study. *Disabil Rehabil*. 2007;29:191-7.
46. Corden A, Sainsbury R. *Incapacity benefits and work incentives*. Huddersfield, UK: Department for Work and Pensions; 2001.
47. Waddell G, Burton A. Concepts of rehabilitation for the management of common health problems. *Best Prac Res Clin Rheumatol*. 2005;19:655-70.
48. Kim J, June K, Yang B, Park E, Park K. Time dependent factors affecting the duration of work disability after compensated low back pain in South Korea. *Industr Health*. 2006;44:503-9.
49. Chibnall J, Tait R, Andersen E, Hadler N. Race and socioeconomic differences in post-settlement outcomes for African American and Caucasian worker's compensation claimants with low back injuries. *Spine*. 2005;114:462-72.
50. Beals R. Compensation and recovery from injury. *West J Med*. 1984;140:233-7.

51. Davey C. Helping personal injury claimants return to work. Implementation and evaluation of a rehabilitation co-ordinator service. Edinburgh: University of Edinburgh; 1993.
52. Schultz I, Crook J, Meloche G, et al. Psychosocial factors predictive of occupational low back disability: towards development of a return-to-work model. *Pain*. 2004;107:77-85.
53. Anema J, Schellart A, Cassidy J, et al. Can cross-country differences in return-to-work after chronic occupational back pain be explained? An exploratory analysis on disability policies in a six-country cohort study. *J Occup Rehabil*. 2009;19:19-26.
54. Buck R, Porteus C, Wynne-Jones G, et al. Challenges to remaining at work with common health problems: what helps and what influence do organisational policies have? *J Occup Rehabil*. 2011;21:501-12.
55. Olenick A, Gluck J, Kenneth E. Factors affecting return to work following a compensable occupational back injury *Am J Industr Med*. 1996;30:540-55.
56. McNaughton H, Sims A, Taylor W. Prognosis for people with back pain under a no-fault 24-hour-cover compensation scheme. *Spine*. 2000;25:1254-8.
57. Kosny A, McEachen E, Ferrier S, Chambers L. The role of healthcare providers in long-term and complicated workers compensation claims. *J Occup Rehabil*. 2011;21:582-90.
58. Jamison R, Matt D, Parris W. Effects of time-limited vs unlimited compensation on pain behaviour and treatment outcome in low back pain patients. *J Psychosom Res*. 1988;32:277-83.
59. McEachen E, Kosny A, Ferrier S, Chambers L. The toxic dose of system problems: why some injured workers don't return to work as expected. *J Occup Rehabil*. 2010;20:349-66.
60. Frank J, Sinclair S, Hogg-Johnson S, Shannon H, Bombardier C, Beaton D, et al. Preventing disability from work-related low back pain. New evidence gives new hope - if we can just get all the players onside. *CMAJ*. 1998;16:1625-31.
61. Dasinger L, Krause N, Thompson P, Brandt R, Rudolph L. Doctor proactive communication, return to work recommendation, and duration of disability after worker's compensation low back injury. *JOEM*. 2001;43:515-25.
62. McCluskey S, Burton A, Main C. The implementation of occupational health guidelines principles for reducing sickness absence due to musculoskeletal disorders. *Occup Med*. 2006;56:237-42.
63. Kosny A, Franche R, Pole J, et al. Early healthcare provider communication with patients and their workplace following a lost-time claim for an occupational musculoskeletal injury. *J Occup Rehabil*. 2006;16:27-39.
64. Verbeek J. How can doctors help their patients to return to work? *PLoS Med*. 2006;3:E88.
65. Anema J, van der Giezen A, Buijs P, van Mechelen W. Ineffective disability management by doctors is an obstacle for return-to-work: a cohort study on low back pain patients sick listed for 3-4 months. *Occup Environ Med*. 2002;59:729-33.
66. Coole C, Watson P, Drummond A. Work problems due to low back pain: what do GPs do? A questionnaire survey. *Fam Pract*. 2010;27:31-7.
67. Coole C, Watson P, Drummond A. Staying at work with low back pain: patients' experience of work-related help received from GPs and other clinicians. *BMC Musculoskeletal Disorders*. 2010;11:190-7.
68. Gray H, Howe T. Physiotherapists' assessment and management of psychosocial factors (Yellow and Blue Flags) in individuals with back pain. *Phys Ther Rev*. 2013;18:379-94.
69. Pincus T, Greenwood L, McHarg E. Advising people with back pain to take time of work: a survey examining the role of private musculoskeletal practitioners in the UK. *Pain*. 2011;152:2813-8.
70. Johnston V, Nielsen M, Corbiere M, Franche R. Experiences and perspectives of physiotherapists managing patients covered by worker's compensation in Queensland, Australia. *Phys Ther* 2012;92:1306-15.
71. Wainwright E, Wainwright D, Keogh E, Eccleston C. Fit for purpose? Using the fit-note with patients with chronic pain: a qualitative study. *Brit J Gen Pract*. 2011;e794.

72. Werner E, Cote P, Fullen B, Hayden J. Physicians' determinants for sick listing LBP patients: a systematic review. *Clin J Pain*. 2012;28:364-71.
73. Nilsing E, Soderberg E, Betero C, Oberg B. Primary healthcare professionals experiences of the sick leave process: a focus group study in Sweden. *J Occup Rehabil*. 2013;23:450-61.
74. ACOEM. Preventing needless work disability by helping people stay employed. ACOEM Guideline. Stay at work and return-to-work improvement committee: American College of Occupational and Environmental Medicine; 2006.
75. Linton S. The back beliefs of health care providers: are we fear avoidant? *J Occup Rehabil*. 2002;12:223-32.
76. Simmonds M, Derghazarian T, Vlayen J. Physiotherapists' knowledge, attitudes and intolerance of uncertainty influence decision making in low back pain. *Clin J Pain*. 2012;28:467-74.
77. Wrapson W, Mewse A. Does the doctor or the patient control sick leave certification? A qualitative study interpreting patients' interview dialogue. *Fam Pract*. 2011;28:202-9.
78. Coudyere E, Rannou F, Tubach Fea. General practitioners' fear avoidance beliefs influence their management of patients with low back pain. *Pain*. 2006;124:330-7.
79. Main C, Burton AK. Engaging patients in their own care for back care: the role of education and advice in the prevention of chronic pain disability. In: Hasenbring M, Rusu A, Turk D, editors. *From acute to chronic back pain: risk factors, mechanisms, and clinical implications*. Oxford: Oxford University Press; 2012. p. 433-52.
80. Guzman J, Yassi A, Cooper J, Khokhar J. Return to work after occupational injury. Family physician's perspectives on soft-tissue injuries. *Can Fam Phys*. 2002;48:1912-9.
81. Gonzalez-Urzelai E, Palacio-Elua J, Lopez-de-Munain J. Routine primary care management of acute low back pain: adherence to guidelines. *Eur Spine J*. 2003;12:589-94.
82. Scheel I, Hagen K, Oxman A. Active sick leave for patients with back pain. All the players onside, but still no action. *Spine*. 2002;27:654-9.
83. Pransky G, Shaw W, Franche R, Clarke A. Disability prevention and communication among workers, physicians, employers, and insurers - current models and opportunities for improvement. *Disabil Rehabil*. 2004;26:625-34.
84. Foreman P, Murphy G, Swerissen H. *Barriers and facilitators to return to work: a literature review*. Melbourne: Australian Institute for Primary Care, La Trobe University; 2006.
85. Franche R, Cullen K, Clarke J, et al. Workplace-based return-to-work interventions: a systematic review of the quantitative literature. *J Occup Rehabil*. 2005;15:607-31.
86. Karrholm J, Ekholm K, Ekholm Jea. Systematic co-operation between employer, occupational health service and social insurance office: a 6-year follow-up of vocational rehabilitation for people on sick leave, including economic benefits. *J Rehabil Med*. 2008;40:628-36.
87. Butler R, Johnson W, Cote P. It pays to be nice: employer-worker relationships and the management of back pain claims. *JOEM*. 2007;49:214-25.
88. Turner J, Franklin G, Fulton-Kehoe D, et al. Early predictors of chronic work disability: a prospective population-based study of workers with back injuries. *Spine*. 2008;33:2809-18.
89. Karlsson N, Skargren E, Kristenson M. Emotional support predicts more sickness absence and poorer self-assessed work ability: a two-year prospective cohort study. *BMC Public Health*. 2010;10:648-59.
90. Svensson T, Mussener U, Alexanderson K. Sickness absence, social relations and self-esteem: a qualitative study of the importance of relationships with family, workmates and friends among persons initially long-term sickness absent due to back diagnoses. *Work*. 2010;37:187-97.
91. Campbell P, Jordan K, Dunn K. The role of relationship quality and perceived partner responses with pain and disability in those with back pain. *Pain Med*. 2012;13:204-14.
92. McCluskey S, Brooks J, King N, Burton K. The influence of 'significant others' on persistent back pain and work participation: a qualitative exploration of illness perceptions. *BMC Musculoskeletal Disorders*. 2011;12.

93. Brooks J, McCluskey S, King N, Burton K. Illness perceptions in the context of differing work participation outcomes: exploring the influence of significant others in persistent back pain. *BMC Musculoskeletal Disorders*. 2013;14:48.
94. McCluskey S, Brooks J, King N, Burton K. Are the treatment expectations of 'significant others' psychosocial obstacles to work participation for those with low back pain? *Work*. 2014;48:391-8.
95. Escorpizo R, Gmunder H, Stucki G. Introduction to Special Section: Advancing the Field of Vocational Rehabilitation with the International Classification of Functioning, Disability and Health (ICF). *Journal of Occupational Rehabilitation*. 2011;21:121-5.
96. Harris I, Mulford J, Solomon M, et al. Association between compensation status and outcome after surgery: a meta-analysis. *JAMA*. 2005;293:391-8.
97. Atlas S, Tosteson T, Hanscom B. What is different about worker's compensation patients? Socioeconomic predictors of baseline disability status among patients with lumbar radiculopathy. *Spine*. 2007;32:2019-26.
98. Gabbe B, Cameron P, Williamson Oea. The relationship between compensable status and long-term patient outcomes following orthopaedic trauma. *MJA*. 2007;187:14.
99. Robinson J, Loeser J. Effect of worker's compensation systems in recovery from disabling injuries. In: Hasenbring M, Rusu A, Turk D, editors. *From acute to chronic back pain*. New York: Oxford University Press; 2012.
100. Brooker A, Frank J, Tarasuk V. Back pain claim rates and the business cycle. *Soc Sci Med*. 1997;45:429-39.
101. Loisel P, Anema J. *Handbook of Work Disability: prevention and management*. New York: Springer; 2013.
102. Slade SC, Kent P, Patel S, Bucknall T, Buchbinder R. Barriers to primary care clinician adherence to clinical guidelines for the management of low back pain: a systematic review and metasynthesis of qualitative studies. *Clin J Pain*. 2016;32:800-16.
103. Pransky G, Buchbinder R, Hayden J. Contemporary low back pain research - and implications for practice. *Best Pract Res Clin Rheumatol*. 2010;24:291-8.
104. Burton A, Balagué F, Cardon G, Eriksen H, Henrotin Y, Lahad A, et al. European guidelines for prevention in low back pain *Eur Spine J*. 2006;15(suppl 2):S136-S68.
105. Darlow B, Dowell A, Baxter G, Mathieson F, Perry M, Dean S. The enduring impact of what clinicians say to people with low back pain. *Ann Fam Med*. 2013;11:527-34.
106. Suman A, Schaafsma F, Buchbinder R, van Tulder M, Anema J. Implementation of a Multidisciplinary Guideline for Low Back Pain: Process-Evaluation Among Health Care Professionals. *J Occup Rehabil*. 2016.
107. Kosny A, Lifshen M, Tonima S, Yanar B, Russell E, MacEachen E, et al. *The role of health-care providers in the workers' compensation system and return-to-work process*. Toronto: Institute for Work & Health; 2016.
108. Shengelia B, Murray C, Adams O. Beyond access and utilization: defining and measuring health system coverage. In: Murray C, Evans D, editors. *Health systems performance assessment debates, methods and empiricism*. Geneva: WHO; 2003. p. 221-34.
109. Black C. *Working for a healthier tomorrow: Dame Carol Black's review of the health of Britain's working age population*. London: TSO; 2008.
110. DWP. *Beliefs about work: an attitudinal segmentation of out-of-work people in Great Britain*. London: Department for Work and Pensions; 2011.
111. Hoving JL, van Zwieten MCB, van der Meer M, Sluiter JK, Frings-Dresen MHW. Work participation and arthritis: a systematic overview of challenges, adaptations and opportunities for interventions. *Rheumatology*. 2013; 52:1254-64.
112. Vassilev I, Rogers A, Sanders C, Cheraghi-Sohi S, Blickem C, Brooks H, et al. Social status and living with chronic illness: an exploration of assessment and meaning attributed to work and employment. *Chronic Illness*. 2014; 10:273-90.

113. McCluskey S, de Vries H, Reneman R, Brooks J, Brouwer S. 'I think positivity breeds positivity': a qualitative exploration of the role of family members in supporting those with chronic musculoskeletal pain to stay at work. *BMC Family Practice*. 2015;16:85.
114. Prang K, Newnham S, Berecki-Gisolf J. The impact of family and work-related social support on musculoskeletal injury outcomes: a systematic review. *J Occup Rehabil*. 2015;25:207-15.
115. Haugli L, Maeland S, Magnussen LH. What facilitates return to work? Patients experiences 3 years after occupational rehabilitation. *J Occup Rehabil*. 2011;21:573-81.
116. Turk DC, Kerns RD, Rosenberg R. Effects of marital interaction on chronic pain and disability: examining the down side of social support. *Rehabilitation Psychology*. 1992;37:259-74.
117. Flor H, Turk DC, Rudy T. Pain and Families II. Assessment and treatment. *Pain*. 1987;30:29-45.
118. Romano JM, Schmalzing KB. Assessment of couples and families with chronic pain. In: Turk DC, Melzack R, editors. *Handbook of Pain Assessment* (2nd edition). New York: The Guildford Press; 2001.
119. Cano A, Johansen AB, Geisser M. Spousal congruence on disability, pain, and spouse responses to pain. *Pain*. 2004;109:258-65.
120. Cano A, Miller LR, Loree A. Spouse Beliefs About Partner Chronic Pain. *The Journal of Pain*. 2009;10:486-92.
121. Gere J, Martire LM, Keefe FJ, Stephens MA, Schulz R. Spouse Confidence in Self-Efficacy for Arthritis Management Predicts Improved Patient Health. *Ann Behav Med*. 2014.
122. Cano A, Williams A C de C. Social interaction in pain: reinforcing pain behaviours or building intimacy? *Pain*. 2010;149:9-11.
123. Cano A, Leong L. Significant others in the chronicity of pain and disability. In: Hasenbring MI, Rusu AC, Turk DC, editors. *From Acute to Chronic Back Pain: Risk Factors, Mechanisms, and Clinical Implications*. Oxford, UK: Oxford University Press; 2012. p. 339-54.
124. Richardson JC, Ong B, Sim J. Experiencing chronic widespread pain in a family context: giving and receiving practical and emotional support. *Soc Health Illness*. 2007;29:347-65.
125. Morgan A, Ziglio E. Revitalising the evidence base for public health: an assets model. *Global Health Promotion*. 2007;14:suppl 17-22.
126. Morgan A, Davies M, Ziglio E. *Health assets in a global context: Theory, Methods, Action: Investing in assets of individuals, communities and organizations*. London: Springer; 2010.
127. Pawson R, Greenhalgh T, Harvey G, Walshe K. Realist review - a new method of systematic review designed for complex policy interventions. *Journal of Health Services Research & Policy*. 2005;10:21-34.
128. Haafkens J, Moerman C, Schuring M, van Dijk F. Searching bibliographic databases for literature on chronic disease and work participation. *Occup Med*. 2006;56:39-45.
129. Young A, Viikari-Juntura E, Boot C, Chan C, Ruiz de Porras D, Linton S. The Hopkinton Conference Working Group on Workplace Disability Prevention. *Workplace Outcomes in Work-Disability Prevention Research: A Review with Recommendations for Future Research*. *J Occup Rehabil*. 2016;26:434-47.
130. Soklaridis S, Ammendolia C, Cassidy D. Looking upstream to understand low back pain and return to work: psychosocial factors as the product of system issues. *Social Science & Medicine*. 2010;71:1557-66.
131. Kendall N, Burton AK, Main CJ, Watson P. *Tackling musculoskeletal problems: a guide for the clinic and workplace - identifying obstacles using the psychosocial flags framework*. London: The Stationery Office; 2009.