

How do peer support interventions for the self-management of chronic pain, support basic psychological needs? A systematic review and framework synthesis using self-determination theory.

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Abstract

Objective: To identify how peer support interventions, for self-management of chronic pain, support basic psychological needs from a self-determination theory (SDT) perspective, using a systematic review.

Methods: Ten databases were searched for studies reporting qualitative research about peer interactions in pain management interventions. ‘Best fit’ framework synthesis methodology was applied to identify strategies that support the satisfaction of competence, autonomy and motivation. These were matched to definitions of strategies provided by standardised taxonomies.

Results: 18 studies were selected for inclusion. The synthesis resulted in a conceptual model, identifying 12 peer strategies that support psychological needs for self-management of chronic pain; 10 overlapped with existing taxonomies.

Conclusion: This was the first known attempt to synthesise evidence about peer support strategies for people living with pain, using SDT as an *a priori* framework. The model demonstrates commonality between the motivation-promoting processes of peer support and those of other behaviour change interventions *and* identifies additional unique strategies provided by peers. This systematic classification of peer support strategies provides a means for future study of the efficacy and comprehensiveness of peer interventions.

Practice Implications: The model could assist healthcare professionals and support groups to optimise the potential of peer processes.

Key words: peer-support; chronic pain; framework synthesis; self-determination theory; self-management motivation

1. Introduction

Chronic pain, defined as pain lasting beyond normal tissue healing time [1] is significantly associated with poor quality of life, disability, depressive symptoms and social isolation [2-6].

Despite a traditional focus on pharmacological approaches to pain management [7], there has been a growing recognition of the psycho-social factors that influence pain experiences [8] and an associated greater emphasis on moving patients towards self-management [9].

Self-management support (SMS) encourages individuals to take substantial responsibility for managing symptoms, treatment, and psychosocial consequences associated with living with a chronic medical condition [10-12]. Sources of SMS include health professionals, relatives, partners, friends and peers living with the same or similar condition [13]. The importance of social connectivity and relationships for living well with chronic conditions is well evidenced in the literature [5,12,13,14]). However, systematic summaries of the literature about *how* peers contribute to SMS are lacking [15].

The use of standardised taxonomies of behaviour change techniques to better describe and classify the practical tools used within interventions to bring about change has marked a step forward in applied health psychology research [16]. However, the more these taxonomies are relied on, the more important it is that they are comprehensive to avoid less frequently studied but nonetheless still important techniques from being overlooked when coding and evaluating interventions. At present, peer effects are implicit and relied on by practitioners, but are not explicitly included within all taxonomies. Therefore, a second purpose of this review was to explore whether existing taxonomies sufficiently capture the process evidence in peer support for self-management in chronic pain, and propose additions where this is not the case.

Qualitative findings are often overlooked by systematic reviews but are important to incorporate within evidence-based health care [17]. This review employs ‘best fit’ framework synthesis [18], a robust methodology that facilitates the application of psychological theory to health intervention reviews [19]. Informed by framework analysis [20], this approach uses an a priori

theoretical framework to guide qualitative data extraction and it employs framework and thematic analysis techniques to undertake the synthesis. As a pragmatic means of conducting rapid synthesis of qualitative data, ‘best fit’ framework synthesis elicits results that can be directly applied by policy makers and designers of interventions [18,19,21].

The *a priori* theoretical framework selected for this review was self-determination theory [SDT-22], a theory used to understand the processes through which a person acquires the motivation for the initiation and maintenance of health-related behaviours [22-23]. Motivation is presented as a continuum from the least autonomous, externally regulated motivation to intrinsically determined, autonomous motivation. According to SDT, autonomously motivated behaviours are more likely to result in better behavioural adoption and maintenance and more positive well-being [22]. The degree to which motivation is autonomous depends on support from our social environment for three innate basic psychological needs: competence (feeling capable, and able to demonstrate capability), autonomy (feeling that one has choice, and is the author of one’s actions) and relatedness (feeling connected to, and valued by, important others) [24].

SDT was selected as the ‘best fit’ framework for this review because the concept of autonomous motivation aligns with the aims of self-management support to increase patients’ involvement and control in the management of their condition [12]. Furthermore, SDT has already been used to create a taxonomy of 18 strategies (SDT Taxonomy) that contribute to autonomous motivation [25]. By systematically describing the active ingredients of behaviour change interventions, taxonomies facilitate meaningful comparisons and evaluations of interventions [26]. This review used the SDT taxonomy, developed by Gillison et al. (2019) to guide the initial data extraction and analysis.

2. Methods

The review followed the method for ‘best fit’ framework synthesis [18], whilst also conforming to guidance about search strategy and study selection within systematic reviews [27].

2.1 Study inclusion criteria

No restrictions were imposed on the date of publication; all studies published up until the final search in April 2021 were eligible. Selection was limited to full text English-language articles reporting qualitative research about interventions that facilitate interactions between adults with non-malignant chronic pain (pain lasting more than 3 months) and reported on peer-related experiences.

2.2 Search strategy

The following databases were searched: MEDLINE, CINAHL, EMBASE, PsychINFO, PsycARTICLES, PsycBOOKS, ProQuest Nursing and Allied Health Database, ScienceDirect and Cochrane Library. The search was conducted by the first reviewer (XX) using relevant search terms and Boolean operators for chronic pain, qualitative research and peer interventions (Table 1).

Electronic tables of contents of journals (2007-20) contributing the highest number of hits in the database search were hand-searched. These were: Journal of Advanced Nursing; Social Science and Medicine; Sociology of Health and Illness; Arthritis Care and Research; Pain Medicine; and Patient Education and Counselling. Grey literature was searched by accessing the websites and online resource centres of The Health Foundation, Public Health England, NHS England, The British Pain Society and twelve national pain-related charities.

Potentially relevant studies were screened and selected using the process outlined by Dundar and Fleeman [27]. First, duplicates were removed and then studies were screened by the first reviewer (XX), using title and abstract, against the inclusion and exclusion criteria (stage 1). The full text of remaining studies was then assessed to establish eligibility (stage 2). A second reviewer (YY) independently screened 10 per cent of the studies in stage 1 and 50% of the studies in stage 2 and recorded equivalent results (Figure 1).

2.3 Quality assessment of studies

XX and YY independently appraised the quality of eligible studies at Stage 2 using CASP questions [28] and considered the relevance of each study to the research question, as consistent with other reviews of qualitative studies [5,29]. Any disagreements about quality assessments were resolved through discussion until 100% agreement was achieved. A rating system, adapted from [29], was

used to categorize the studies as a 'key paper', 'satisfactory' or 'unsuitable'. Unsuitable studies were excluded at this stage and then referred to later for sensitivity analysis.

2.4 Data extraction, coding and synthesis

Descriptive data was extracted by XX. Data from the 'Results' sections of the studies that discussed participants' experiences of peer support was independently coded by two reviewers (XX and ZZ) using an SDT taxonomy [26]. This *a priori* framework, which is informed by a systematic review of 74 SDT-related studies, specifies 19 strategies used within interventions designed to support the three basic psychological needs of Competence, Autonomy and Relatedness.

Coding was undertaken by first identifying excerpts in which support for self-management was described as a feature of the peer support interventions. Discrete SMS strategies within excerpts were compared with existing strategy descriptors in the SDT taxonomy and close alignments were recorded. In many cases, the same excerpt could be coded to multiple strategies.

Some studies described strategies that were not pre-planned but arose incidentally from interactions between peers. Because these group processes were highlighted as significant by participants, they were coded in the same way, using the taxonomy. This is consistent with how this was tackled in a recent project to develop a taxonomy of group-level behaviour change techniques [30].

The reviewers met to discuss coding decisions and identify excerpts that could not be aligned to the SDT taxonomy. These were then compared with the descriptors for the 93-item Behaviour Change Taxonomy [31] to seek a match from this pool. Where the descriptions within excerpts did not align with existing strategies, new strategies were created. In this case, the reviewer recorded and described the strategy, and then adopted a thematic approach to analysing the features of additional strategies together following the coding of all papers, to arrive at a refined and parsimonious set of definitions. At the end of this process all papers were reviewed using the new definitions.

Finally, XX synthesized the data into a model representing the whole data set, regularly seeking feedback from ZZ about clarity, verifiability and plausibility of the model, as recommended by Dixon-Woods et al. (2006)[32].

2.5 Sensitivity analysis

Sensitivity analysis was employed to test whether the synthesis was affected by the omission of studies excluded on the basis of quality and to confirm that themes within the model were not reliant on a single study [17].

3. Results

3.1 Search results

Our search yielded 1616 records after duplicates were removed. Following title and abstract screening, 54 records remained. These were read in full and assessed for eligibility. 16 studies were eligible to be included in the review (Figure 1). The reference lists of the 16 studies were checked for additional empirical research, resulting in five additional records.

3.2 Quality of eligible studies (see Table 2)

Overall, the quality of the studies was rated 'high' with many meeting all or most of the quality criteria (Table 2). Eleven studies were coded as 'key papers', seven were coded as 'satisfactory' and three were coded as 'unsuitable' and excluded from the review (see Supplementary Information 1). Therefore 18 studies were selected for inclusion in the review (see Figure 1), reporting on 17 different peer interventions (two records concerned the same intervention).

3.3 Description of selected studies (see Table 2). Six studies were conducted in the United Kingdom (UK), five in the United States (US), two in Sweden, one each in Canada, Norway, Finland, Denmark and the Netherlands.

Eleven studies focused on peer-led interventions. Of these: three concerned group meetings and other peer-led activities delivered within support-groups or associations; three considered peer-led self-management programmes/courses; two explored peer coaching/mentoring; and three investigated online communities. Seven studies focused on interventions delivered by healthcare

professionals which included a peer-support component. Of these, five involved multiple activities including group sessions and two were exclusively group-based.

Individual interviews were conducted in nine studies and were the dominant method of data collection, five used focus groups and the remaining four used analysis of message content. Analysis methods were wide ranging (e.g., interpretative phenomenological analysis (IPA), grounded theory, thematic analysis, discourse analysis and immersion/crystallization methodology).

3.4 Sensitivity analysis

Excluding three eligible studies on the grounds of quality [33-35] did not affect the results of the review. The excluded studies did not contribute new strategies to the framework, nor did they help to elucidate the strategies and their relationship to each other, as mapped out in the conceptual framework.

3.5 Coding of included studies

The 18 included studies were coded using the SDT taxonomy [26] (Table 3). Twelve strategies were identified in total; nine strategies included in the original SDT taxonomy, one included in the Behaviour Change Taxonomy [31] and two additional strategies (Table 3).

3.6 Framework synthesis and the conceptual model

The conceptual model (Figure 2) brings together the twelve strategies that this review identified as facilitating the satisfaction of the three domains of autonomy, competence and relatedness within peer interventions for people with chronic pain. Each strategy is explained in more detail below.

Autonomy

Autonomy refers to being in control of own behaviour and goals. The review identified four strategies that supported the autonomy of study participants included in the original SDT taxonomy [26]: Choice (SDT1), Acknowledge Personal Perspective (SDT2), Use of Non-controlling Language (SDT4) and Emphasise Responsibility (SDT7).

Choice and Use of Non-controlling Language: These strategies refer to the process of discussing options and choices together in a non-controlling way. When participating in discussions with peers,

participants were exposed to many different ideas or suggestions and had the freedom to weigh up their options and choose how to respond [36-39].

“They gave you like, you got ideas, you got ideas from it without being pushed into anything or feeling uneasy about it” (C10) [36, p.496].

Acknowledge personal perspective. This strategy refers to the process of peers acknowledging and affirming each other’s perspectives and experiences. It was a dominant strategy, evident in fifteen of the studies. Conveying personal perspectives and experiences to peers was different to talking to friends, family and colleagues. Shared experience contributed to a sense of being believed (38, 40-42] and understood [43-48]. Participants reported that their peers were genuinely interested in their accounts [38,39,42], accepted them without judgement [37] and were sympathetic towards any expressions of frustration, difficulty or despair [42,45-47].

“It is easier to talk about difficult matters if I think I will be understood, because there is nearly always somebody here who has at least had a similar experience and knows what it means.” [46, p.283]

Confiding with peers therefore supported participants’ autonomy because their experiences were authenticated and recognised as real [42,44,46]. Their personal experiences and struggles were viewed with respect rather than shame [41], which bolstered participants’ belief that their needs mattered [44] and helped them to consider how they might re-engage with life positively [37].

Emphasise responsibility: Some studies revealed how being exposed to multiple accounts of self-responsibility, based on first-hand experiences of comparable conditions, can be impactful. By talking about their personal journeys, participants offered new ways of thinking about their condition, demonstrating that pain doesn’t have to be in control [36, 37, 44,47]. The narrative of moving towards acceptance and self-determination to live well, despite pain, was prominent in some studies [37,39,44].

“I was so angry about the life I lost and when I heard people in this room talk about acceptance, I started to think, I want a life again.” [44]

In summary, the review suggests that peer interventions have the potential to support the satisfaction of autonomy by authenticating personal experiences and emphasising choice and responsibility.

Competence

Competence refers to gaining mastery of tasks and learning different skills. The review identified three competence-supporting strategies that were included in the original SDT taxonomy: Task Climate (SDT 10); Exchange Information (SDT13) and Provide Support and Encouragement (SDT15). Two additional strategies were suggested by the review: Share Progress and Facilitate Access to Professional Support. In addition, we observed Re-evaluation Through Social Comparison that is included in Michie & Abraham's behaviour change taxonomy (identified as 6.2) that cuts across theories of behaviour change [31].

Task Climate. Five studies reported a task climate where there was emphasis on performing activities that were suited to individual situations and capabilities (in other words, their 'life context').

Participants had conversations about behaviour-focused goals

“We're all totally different people with different lifestyles and so you try to reach those goals within your own lifestyle and I knew where mine um differed and I knew where mine needed to go” (M09). (L12). [36, P.497]

Exchange Information. Fourteen studies reported information exchanges between peers. This enabled participants to “refill their toolkits” [37, p.670) and discover new “tips and tricks.” [39, p.2252].

I didn't even think of getting a heating pad before I went on there [Instagram] and that changed my life by helping my pain! [40, p. 242]

. The experiential nature of the knowledge meant it was perceived as credible and trustworthy [37; 39,43], particularly when participants with a longer history of illness supported new users who struggled to understand the nature of their symptoms [40].

Encouragement and Support. In some studies, it was those who had lived with their illness longer that were reported to take on the role of 'cheer-leader', willing-on others to make progress towards their goals [39,43, 45,47]. In other studies (36, 38, 40, 44, 45, 47) encouragement was described as a by-product of peers sharing their experiences of self-management successes.

“Patients could see the changes in each other, and mutual encouragement became a useful part of the group process as members reengaged in valued activities they had previously abandoned because of fatigue.” (F13). [36, p.499]

Share Progress. Sharing examples of capabilities and achievements with an audience of peers was highlighted as significant [45, 47]. Through this, participants could mark or celebrate accomplishments that might seem insignificant to those living without pain:

“It might not seem like much but this is a big step forward for me.”

[45, p. 624]

Re-evaluation Through Social Comparison. Six studies offered accounts of participants gaining insights through comparison of their experience with their peers. Seeing others succeeding could be motivating and reassuring [e.g., 49]:

“Well, that person can do this...so I’m going to try and do it. She has pain, I have pain.” (Denise) [50, p.434]

Other studies showed how social comparison enabled participants to see themselves as stronger or more resourceful than their peers. This in turn gave them confidence that they could cope or take better care of themselves in order to avoid the more severe symptoms experienced by their peers.

‘I’m sitting there thinking I’m slightly better and a few of the members are genuinely really, really sick. And I said to myself “ah get your backside off your chair”’. (Alex) [37 p.668]

Facilitate access to Professional Support. Five studies revealed how peer interventions facilitate access to sources of professional support. For example, participants were encouraged to speak to a health professional about their medication [47] or household adaptations [40] or supported to attend a weight management programme [39]

L: I often pass out standing up from a sitting position, BP drops a lot. I have cool showers—hot water not good—and I have a shower chair. I recognize when it’s going to happen and get on the floor. Could be worth you getting your doctor to check these out.

S: Wow! Good to know, I’ll ask my doctor next time I see her.’ [40]

In summary, the review suggests that a perceived strength of peer interventions is their ability to offer credible and practical information that builds participants' competence to manage their condition. Participants have the opportunity to mark their achievements and benchmark their progress through social comparison.

Relatedness

Relatedness stems from a sense of being respected, understood and cared for. Two strategies were identified that promoted this within the review, but it was also notable that forming socially meaningful, co-operative relationships with peers was central to the power of peer processes to support competence, as this underpinned why the information and advice from peers was trusted and valued:

Enabling social support seeking: Most studies noted that peer support interventions provided direct access to social support and a sense of community, in contrast to the social isolation that often accompanies living with a pain [36,37,38, 44,51].

‘I dunno, the only way you could describe it really is being a foreigner in a foreign country and suddenly finding somebody who spoke your own language and you could relate’. (Ron). [37, p.667]

Social support brought benefits, including: distraction from pain [39]; respite from judgement [37]; joy [38]; improved mental health [43,44]; symptom-validation [42, 44] and hope for the future [44].

Connecting with peers increased capacity to cope and adjust to life with pain. Participants' experiences and symptoms were validated, they felt heard, understood, and better able to recognise that other ways of living were possible:

“And then you hear that there are several others who are experiencing the same thing and it is possible that there is nothing odd about me and this is enormously important for my self-confidence, then I can go out and meet the world with much less apprehension!” [46, p. 284]

Group co-operation. Peer interventions were valued by participants because they afforded opportunities to *give*, as well as receive, assistance [39, 42, 52].

“So, I leaped at the chance to be a peer...because I feel with my past experiences, I could help.” [39, p.536].

In other instances, ‘giving and receiving’ cemented relationships between peers and demonstrated they were in communion and shared ‘fellowship’[53].

We meet each other, we encourage each other, and we are there for each other (P3). Yes, it’s togetherness we get (P5). (FG4)” [38, p.1757]

One study [45] showed how the act of giving information and advice also provided an opportunity to demonstrate capabilities and achievements. As such, group co-operation was supportive of both relatedness and competence.

In summary, the formation of supportive and co-operative social connections with other people who share similar experiences, made a necessary contribution to the processes of adjustment and self-management.

4.0 Discussion and conclusions

4.1 Discussion

This review employed a ‘best fit’ framework synthesis methodology [18] to understand how peer support contributes to motivation to self-manage chronic pain. Eighteen studies reporting qualitative data were systematically identified and synthesised. The intervention models were wide-ranging and included support groups, peer-led self-management programmes, peer coaching, online communities and professional-led groups. The studies included were of high quality, with 11 studies assessed as key papers. The selected papers offered sufficient evidence to develop a conceptual model.

In systematically defining strategies that promote self-management motivation, this review has put peer processes onto a footing that is equivalent to professionally delivered support. It provides a new theory-informed conceptual model to comprehensibly describe, compare and evaluate the ‘active ingredients’ of peer support interventions. Although there is a moderate fit with the SDT taxonomy, we have redefined each strategy to demonstrate how it is operationalised within a peer context (for example, it is the process of ‘discussing options and choices together’ that supports the need for autonomy). Two new competence supporting strategies, not evident in existing taxonomies, were observed, suggesting additional unique processes that appear only to be provided

by peers: sharing of self-management capabilities and achievements; and the offering of encouragement and information to facilitate access to professional support.

The use of qualitative data has facilitated fine-grained explication of each strategy, which aids the translation of the findings into applied contexts. For example, we report that ‘exchanging information’ is supportive of competence when there is trust and respect for the lived experience of those imparting knowledge; and ‘social support’ aids relatedness when there is respite from judgement and symptom validation. Using qualitative data from different types of group settings, provides additional insight that can assist in identifying the important processes that operate within group treatment settings [54]. It has been observed elsewhere that there can be a difference between what facilitators and recipients feel has been delivered in behavioural interventions [55-56]. By focusing on the reported experiences of participants, this review provides a user-focused description of intervention content which may help to explain this variation.

It is feasible that different reviewers may have generated a different conceptual model [57], or classified observations differently if using a different *a priori* framework. ‘Best fit’ framework synthesis methodology is relatively new, and we necessarily adopted an inherently interpretive methodology. The studies did not refer explicitly to SDT in their analysis, but this was interpreted post-hoc by the reviewers in line with methodological approaches to mine data across a number of studies and bring new interpretations by drawing on theory that was not considered by the original authors [58].

Another limitation posed by the nature of the studies within the review, is that many also involved professional support so participants were not reporting on the experience of peer support exclusively in all cases. While we excluded comments and findings that explicitly related to professional rather than peer support, the two cannot be considered entirely independently; for example, professional facilitators may have been essential to creating an environment in which peer support could be effective.

4.2 Conclusion

This was the first known attempt to use a qualitative review methodology to understand the contribution of peer interventions to chronic pain management through the satisfaction of competence, autonomy and relatedness. The results elucidate the range of strategies that interact, within this context, to facilitate change. More research is needed to understand the range of factors that govern whether individuals benefit from peer interventions, but systematically identifying the content of approaches may help in this process. There is considerable scope to evolve the conceptual model beyond the self-management of chronic pain by exploring its suitability for understanding other chronic illness peer support interventions.

4.3 Practice implications

There are calls to better understand what takes place within peer support interventions, to establish how peer support works, in what circumstances and for whom [59]. This review contributes to this evidence base, by teasing out the peer processes that foster the support of basic psychological needs underpinning self-management motivation. The review provides a framework of replicable descriptors of the processes participants identify as useful to their progress. The results indicate that peer interventions facilitate multiple, mutually-reinforcing strategies that fulfil a highly valued function for both those who provide and receive peer support. Furthermore, this finding is not context-dependent; strategies fostering self-management motivation were identified in online and face to face interventions, and in those that were peer-led or when peer interactions were facilitated by a healthcare professional.

The conceptual model complements insights from a review about the requisite skills, knowledge and attributes of leaders of support-groups [60]. Our model could be used for designing, monitoring and evaluating peer support initiatives (see Supplementary Information 2). For example, it could assist healthcare professionals to optimise the potential of peer-processes or be applied by support group hosts/leaders to monitor the effectiveness of established groups by identifying if the essential elements are evident in ongoing interactions. Furthermore, application of the model could

increase participants' understanding of what *they* can do to derive and/or offer maximum benefit in their peer interactions.

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Table 1. Search terms used

	Search Terms
Sample	“chronic pain” OR “persistent pain” OR “back pain” OR “musculoskeletal pain” OR “MSK” OR “fibromyalgia” OR “headache” OR “arthritis” OR “rheumatoid” OR “osteoarthritis” OR “pain” OR “rheumatism” OR “osteoporosis” OR “neck pain” OR “facial pain” OR “nociceptive pain”
Phenomenon of Interest	“group” OR “peer” OR “peer-support” OR “self-help groups” OR “support-group” OR “self-help” OR “pain support groups” OR “peer-led” OR “social support” OR “peer intervention” OR “health coach” OR “lay adviser” OR “lay support” OR “peer volunteer” OR “patient led”.
Design and Research type	“qualitative” OR “phenomenology” OR “grounded theory” OR “GT” OR “discursive” OR “mixed method” OR “narrative” OR “thematic analysis” OR “interviews” OR “focus groups”

Table 2 Description of the individual studies included in this review

Key	Author (year)	Research Question / Aim	Ind	Intervention type	Intervention duration	Location	Data collection method	Data analysis method	Quality rating*
1	Ammerlaan et al. (2017)	Investigate the effectiveness of a web-based self-management intervention	Young adults with Juvenile Idiopathic Arthritis (n=72)	Web-based intervention guided by peer trainers	90 minute weekly group Chat, information and discussion board	Netherlands	Analysis of Chat	Thematic analysis	S
2	Bearne et al (2016)	Explore participants’ experiences of education and self management programme	Adults with RA (n=12)	Home exercise regime supplemented by 4 group sessions	4 supervised group sessions	UK	Interviews	Thematic analysis	S
3	Berard and Smith (2019)	How does an online community develop and maintain itself and create social capital for its users?	Popular Instagram users (n=15)	Online community of people living with fibromyalgia	Indefinite	Canada	Analysis of 50 posts and open-ended questionnaires	Content analysis and semiotic methodology	S
4	Bourgault et al (2015)	Evaluation of the efficacy of a self-management programme	Adults with fibromyalgia (n=29)	Facilitated group sessions led by health professional	9 group sessions	US	Group interviews 6-9 months after programme	Thematic analysis	S
5	Dures et al. (2012)	Explore patients’ perspectives of a cognitive behavioural programme	Patients with RA (n=40)	Group-based intervention, led by healthcare professionals	Cognitive behavioural programme for 6 weeks, 2 hours per week and 1 hour consolidation at week 14	UK	Focus groups	Hybrid thematic approach	KP
6	Finlay and Elander (2016)	Investigate the decision-making processes involved in the choice to attend a	Adults with RA who had completed a 6 week pain manage-	Support group, led by peers.	Chronic Pain support group; duration and length of	UK	Interviews	Interpretive phenomenological analysis (IPA)	KP

		chronic pain support group following discharge from a pain management programme	ment programme (n=12)		meetings not detailed				
7	Gustafsson, Ekholm & Ohman (2004)	Describe and analyse how participants with fibromyalgia (FM) or chronic musculo-skeletal (MSK) pain experienced a rehabilitation programme	Females with FM or MSK pain (n=16)	Multi-method intervention, led by healthcare professionals	Multi-disciplinary, rehabilitation programme; duration not detailed	Sweden	Interviews	Grounded theory	S
8	Juuso, Soderberg, Okssib & Skar (2014)	Describe the significance of FM associations for women with FM	Females with FM who are members of FM associations (n=17)	Support group, led by peers	FM or Rheumatology Association group meetings: duration not detailed	Sweden	Focus groups	Thematic content analysis	KP
9	Matthias et al. (2016a)	Understand facilitators and barriers to participation in a peer support intervention for self-management of chronic pain	Veterans with MSK pain (n=20)	Peer coaching	Over a four month period, two contacts per month	United States	Interviews	Immersion/Christallization methodology	KP
10	Matthias, Kukla, McGuire & Bair (2016b)	Uncover the elements of a peer-supported self-management intervention that are perceived by participants as essential to achieving positive changes	Veterans with MSK pain (n=20)	Peer coaching	Over a four month period, two contacts per month	United States	Interviews	Immersion/christallization methodology	KP
11	McCarroll (2015)	Explore the effects of attendance at a peer support group on the quality of life of rheumatoid arthritis (RA) patients	Patients with RA (n=23)	Support group, led by peers	RA support group meeting monthly for six months, group sessions lasted one hour	United States	Audio recording of support group sessions plus interviews	Content analysis	KP
12	Rasmussen, Amris and Rydahl-Hansen (2017)	To describe how a group-based multidisciplinary rehabilitation for patients with fibromyalgia influence patients' self-efficacy and ability to cope with their illness.	Patients with fibromyalgia (n=17)	Multi-disciplinary rehabilitation programme	3-5 hour sessions every day for 10 days	Denmark	Semi-structured interviews	Grounded Theory	KP
13	Rodham, McCabe & Blake (2009)	Explore how an online message board for people with Complex Regional Pain Syndrome	All messages and responses over a four month	Online community, led by peers	Online message board where information is exchanged between	United Kingdom	Analysis of message content	IPA	KP

		(CPRS) was used by members	period were analysed (n=119 messages)		people with CPRS				
14	Sallinen, Kukkurainen & Peltokallio et al. (2011)	Analyse how experiences of peer support were described and reflected upon several years after a group rehabilitation programme	Women with FM (n=20)	Multi-method intervention, led by healthcare professionals	Multi-disciplinary rehabilitation course delivered over 17-20 days.	Finland	Interviews	Narrative Analysis	KP
15	Sandhu et al. (2016)	Examine the feasibility and potential benefits of early peer support to improve the health and quality of life of individuals with early inflammatory arthritis (EIA)	Adults with EIA (n=9 mentors and 9 mentees)	Peer mentoring	Six to twelve meetings of 10-120 minutes	Canada	Interviews and participant diary	Unclear	U
16	Steihaug and Malterud (2002)	Study the types of action and interaction that the women considered to have benefitted from by participating in the group	Women with chronic muscular pain (n=31)	Multi-method intervention, led by healthcare professionals	Discussion group following movement training, over 10 months for one hour per week	Norway	Focus groups	Phenomenological analysis	S
17	Subramaniam, Stewart & Smith (1999)	Study the process of establishment and evaluate the outcome of participation, in a self-help support group for people with chronic pain	Adults with chronic pain (n=13)	Support group, plus other activities, led by peers	Pain support group meeting monthly plus other activities.	New Zealand	Interviews	Unclear	U
18	Turner et al. (2020)	To examine factors influencing initial engagement, ongoing participation, learned behaviors, and subjective functional outcomes after self-management programme	Adults with chronic pain (n=35)	Pain self-management programme delivered by community health workers/experts	8 x 30 minute lectures and skills practice	US	Focus groups and interviews	Inductive thematic analysis	U
19	Turner, Williams and Barlow (2002)	Explore the experiences of participants of an arthritis self-management programme at three time points	Adults with arthritis (n=16)	Self-management course, led by peers	Arthritis self-management programme, six sessions, 2.5 hours each week	UK	Interviews	Middle order approach	KP
20	Willis (2016)	Examine self-efficacy within computer-mediated communication	Members of arthritis related online communities	Online community	Online communities for people with arthritis	US	Analysis of message content	Online ethnography and discourse analysis	KP

		of four online health communities used by people with arthritis	identified as 'opinion leaders' (n=20) (messages = 8231)						
21	Wooten, Wood & Cook (2008)	To investigate the recruitment to, and value of, an expert patient programme for patients with chronic spinal pain	People with spinal pain (n=5)	Self-management course, led by peers	Expert patient programme, delivered over six sessions, three hours per session	UK	Interviews	Immersion/christallization methodology	S

*Overall quality rating: Key paper (KP) = meets all or most of quality criteria and high relevance to review question; Satisfactory (S) = meets all or most of the quality criteria and medium relevance to review question; and Unsuitable (U) = does not meet all or most of quality criteria and/or low relevance to review question

Table 3: Results of coding against the a priori framework (Gillison et al. 2017)

SDT Strategies	Description	Number of studies coded	Study details (see Table 1)	Primary target
SDT 1 Choice	Peers discuss options and choices together	5	5,6,8,10,20	Autonomy
SDT2 Acknowledge personal perspectives	Peers acknowledge and affirm each other's perspectives and experiences	15	2,3, 6,7,8,9,10,11,12,13,14, 16, 20,21	Autonomy
SDT 4 Use of non-controlling language	Peers discuss options for self-management in a non-directive way	4	5,6,8,10	Autonomy
SDT7 Emphasise responsibility	Peers help each other to accept that they have personal responsibility for self-management.	6	5,6,8,10,11, 20	Autonomy
SDT 10 Task Climate	Peers discuss and plan self-management activities that are suited to their situation and capability, focusing on the achievement of actions rather than their outcomes	5	1,5,8,10,13	Competence
SDT13 Exchange information	Peers exchange information about self-management and sources of information and support, relevant to needs.	14	1,2,3,4,5,6, 9,10,11,12,13,14,19, 20	Competence
SDT15 Provide support and encouragement	Peers offer encouragement to perform self-management activities	10	1,3,5,8, 9,10,11,12,13,20	Competence
SDT17 Enable social support seeking	Peers form supportive social connections inside the group	13	2,3,4,5,6, 8,9,10,11, 13,14,19, 20	Relatedness
SDT 18 Group co-operation	Peers form reciprocal relationships that involve giving and	10	3,4,6,8,9,10,12,13,14 ,19	Relatedness

	receiving information and support.			
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Notes: No examples were found of SDT 3 (Provide a rationale), SDT 5 (Intrinsic goal orientation), SDT 6 (Structure), SDT 8 Explore reasons, SDT 9 (Motivational Interviewing), SDT11 (Provide optimal challenge), SDT 12 (Provide informational feedback), SDT 14 (Barrier identification), SDT 16 (Involvement) and SDT 19 (Use of incentives) so they are not included in this table.

Table 3: Additional strategies not coded to a strategy within the SDT taxonomy (Gillison et al. 2017)

Strategies	Description	Number of studies coded	Study details	Primary target
Share progress	Peers have opportunities to share examples of their self-management capabilities and achievements	2	5,6,7,13,20	Competence
Re-evaluation through social comparison	Peers have opportunities to compare their experience with each other	6	1,2,3,6, 12,14	Competence
Facilitate access to professional support	Peers facilitate access to sources of professional support by offering encouragement and information	5	3,6,8,10,20	Competence

Figure 1: Results of the search strategy

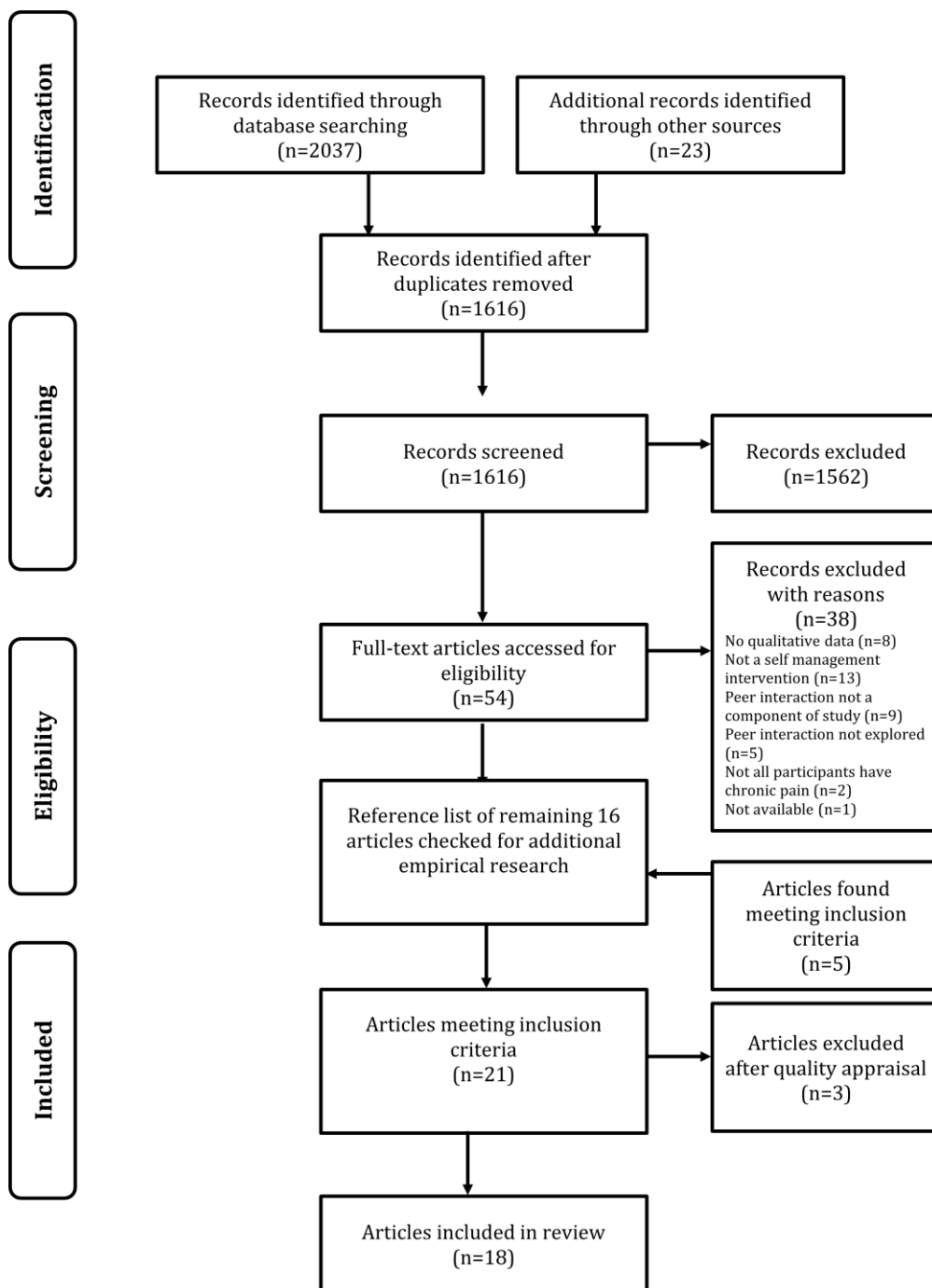


Figure 2: Conceptual model of strategies that facilitate the satisfaction of Competence, Autonomy and Relatedness within the context of a peer support intervention for people with chronic pain

