Education programs for people living with chronic pain: a scoping review

Review

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Abstract: **Objective:** The aim of this scoping review was to provide evidence for health practitioners to improve patient education practice for chronic pain management.

Methods: A scoping review was guided by Arksey and O'Malley's (2005)¹ five-stage framework, investigated contemporary patient education programs (2007–2018) for chronic pain management in education content, formats of delivery, and tools used for evaluation. Content analysis and description were used for the outcome report.

Results: Seven quantitative studies were included. Education content consisted of General information, Cognitive behavior therapy (CBT), Self-management, and Pain neurophysiology (PN). Education delivery formats varied from workbook to workbook, face-to-face, online, when given for a group or individual or in a combined way. In total, 19 tools were reported for the evaluation of the education programs.

Conclusions: There is a variety in the education content and the delivery formats. The majority of programs showed effectiveness in patients' chronic pain management based on their selected evaluation tools. This review showed that patient education programs can be useful in chronic pain management. The effectiveness of patient education programs focuses on the improved patients' physical function and quality of life rather than the cessation of pain only.

Keywords: patient education • chronic pain management • scoping review • taxonomy • pain • patient education

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1. Introduction

Chronic pain is a prevalent and costly health care issue worldwide.² The social and economic impact of individuals suffering from chronic pain is well documented in the literature.^{2–7} In Australia, one in five people is thought to live with chronic pain, and the prevalence rises to one in three among Australians aged >65 years.⁸ Chronic pain is often difficult and complex

to treat and has become Australia's third most costly health problem.^{9,10}

Current evidence suggests that chronic pain is managed effectively when a multidisciplinary health team is involved^{3,11–18} and a combination of therapeutic approaches is adopted including physiotherapy, psychological interventions, and medication. Patient education is an integral component of a successful pain management plan.^{13,19–22} People with chronic pain need

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to understand their condition, be active participants in their treatment, and comply with therapeutic interventions.²³ Also, education is central in establishing and maintaining the positive behaviors needed for effectively managing the chronic pain.²⁴

Practically, a multidisciplinary pain management program is evaluated as an all-inclusive intervention rather than as individual components.^{12,25,26} For example, patient education is not commonly evaluated as an integral component of a multidisciplinary program for people living with chronic pain for its standalone effectiveness.^{13,27} Questions related to the content, delivery mode, and timing of an effective chronic pain management education program remain largely unanswered. According to the British Pain Society,¹⁹ these factors should be evaluated appropriately.

To address this gap and better understand the current practice of patient education in chronic pain management, a scoping review was conducted. The aim of this review was to investigate contemporary education programs for chronic pain management, explore the education content, formats of delivery, and tools for evaluation, and identify the evidence of the best practice of patient education programs to inform health professionals about how these programs might be improved.

2. Methods

This scoping review was guided by Arksey and O'Malley's¹ five-stage framework. A scoping review is defined as "a form of knowledge synthesis that addresses an exploratory research question aimed at mapping key concepts, types of evidence, and gaps in research related to a defined area or field by systematically searching, selecting, and synthesizing existing knowledge."²⁸ Because of the nature of review, it answers a broad range of questions whereas the intention of a systematic review is to answer a well-defined question where there is an existing body of literature.²⁹ Thus, a scoping review is different from a systematic review because it is exploratory, attempts to cover a broad field of literature, and can be undertaken to explore whether there is enough literature to inform a systematic review. In this case, the scoping review was designed to explore patient education practices for chronic pain management to identify best practice or knowledge gaps in this field. The five-stage framework involved: (1) identifying the research questions; (2) identifying relevant studies; (3) study selection; (4) data charting and collection; and (5) summarizing and reporting the results.

2.1. Stage one: identifying the research questions

The research questions posed for this review were:

- (1) What is the content of the education programs for people living with chronic pain?
- (2) How are these education programs delivered?
- (3) What evaluation tools have been used to assess the effectiveness of the education programs for chronic pain management?
- (4) What kinds of education programs are effective in chronic pain management?

2.2. Stage two: identifying relevant studies

To ensure that sufficient information was captured, a comprehensive database search was undertaken which included Medline, CINAHL, Embase, Health and Psychosocial Instruments, PsycINFO, Ovid Nursing Database, Health Collection, Ageline, Cochrane Library, and Scopus. Key search terms used were chronic pain, persistent pain, and patient education program. This review includes primary quantitative studies published in English between January 2007 and December 2018. This time frame was selected after considering the advancement of chronic pain management in Australia over this period.³⁰ This review was limited to patient education programs only and studies that combine education with other interventions were excluded.

2.3. Stage three: study selection

In total, 1,146 articles were identified through the database search. After discarding the duplications, 514 articles remained. After title and/or abstract screening, 62 articles were identified to be relevant to the study questions. Full texts of these articles were obtained, with each article screened against the inclusion criteria. The inclusion criteria applied to selection were:

- (1) primary research of a quantitative nature was reported;
- (2) participants in the studies were ≥ 18 years with non-cancer;
- (3) chronic pain duration ≥ 3 months and the education program was evaluated independently for its effectiveness.

Seven articles met the inclusion criteria. Examples of studies excluded were the articles in which there is no clear information on duration of pain of participants^{31,32}; education was combined with other interventions^{33,34}; and

there is non-primary quantitative studies.^{35–37} The flow-chart in Figure 1 shows the process of article selection.

2.4. Stage four: data charting and collection

Further, a data extraction form was developed and used for ensuring the accuracy of the data collected from selected studies. Data collected from studies included author(s), year of publication, the location (country) of study, study aims, study design, study setting, participants, outcomes, and a brief comment of the limitation. Details of the selected studies are provided in Table 1.

2.5. Stage five: summarizing and reporting results

In this stage, the extracted data were analyzed and then summarized. To address question 1 of the study (the content of education programs for people living with chronic pain), a content analysis was conducted to identify the key content or subject and that group key subject matter was covered in programs. To answer research questions 2–4, information was extracted from the studies on the education delivery format; the evaluation tools were used to assess the effectiveness of the education program; the study outcomes; and reported descriptively.

3. Results

This review included 7 studies from 3 countries. Among these, 3 studies were conducted in USA, 3 in Belgium, and 1 in Australia. Four studies focused on the influences of different education contents.^{39–42} Two studies conducted only a pre to post test without using control groups for the evaluation of the effectiveness of the education programs,^{43,44} and one study focused on the influence of different delivery formats.³⁸

3.1. The content of the education programs for people living with chronic pain

The content of education programs covered a broad range of information that was grouped into four categories: General information, CBT, Self-management, and PN (see Table 2 for the detail of the content of the education programs).

Data analysis showed that education programs for people living with chronic pain contained a range of general information which included information about symptom identification,^{38,44} treatment options and complementary treatment,^{39,40,43} pain medication,^{39,43,44} working with health professionals,^{38–40} eating and health,^{39,43} weight management and smoking cessation,⁴³ and back pain causes, prevention, and treatments.⁴⁰ Five out of the

Figure 1. The review process flowchart.

Study	Country	Study type	Interventions/study design/study aim	Study setting	Participant	Outcomes	Study limitation
Dear et al. ³⁸	Australia	Randomize controlled trial	Online vs. workbook; Identical contents of information given to each group over 8 weeks, 2 psychologists with weekly contact to support their learning; (1) To provide information that helps participants to understand and deconstruct their symptoms and difficulties; (2) To teach a range of self-management skills to help participants manage their symptoms and difficulties; and (3) To reduce pain-related disability and improve emotional well-being by encouraging the practice and adoption of the skills taught within the program.	Clinic & Community	178 adults with chronic pain	Both groups had similar positive result in level of disability, anxiety, and depression for immediate post treatment, 3 months and 12 months follow ups	The absence of a control group which limits the ability to control for general time effects, spontaneous remission, and the impacts of other treatments
Morone et al. ³⁹	U.S.A	Randomize controlled trial	Meditation vs. education; 8 weeks program, group education, one topic 1 week; To determine the impact of an 8-week mindfulness meditation program on disability, psychological function, and pain severity in community-dwelling older adults with chronic low back pain, and to test the education control program for feasibility.	Community	40 Adults ≥65 years with chronic low back pain	Both groups improved on measures of disability, pain, and psychological function, both at program completion and 4 months follow-up	Small sample size, the sample was also predominantly white and well-educated
Chiauzzi et al. ⁴⁰	U.S.A	Randomize controlled trial	Website vs. text based; Two groups received different information: website group with CBT and self-management as principle; text group had general information of back pain sent by regular email; To determine whether an interactive self-management website for people with chronic back pain would significantly improve emotional management, coping, self-efficacy to manage pain, pain levels, and physical functioning compared with standard text-based materials.	Clinic & Community	209 adults with chronic back pain	Online interactive group with tailored contents showed effect changes in pain, depression, anxiety, and global rates of improvement compared with text group	Control group does not have same support as from the intervention group in the study; different recruitment ways brought participants with different baseline conditions
Van Oosterwijck et al. ⁴¹	Belgium	Randomize controlled trial	PN vs. pacing self-management; 2 weeks education, once a week, first session was one-to-one and face-to-face, second session was delivered through telephone contact to ensure participants understanding the information from session one; To examine whether intensive pain physiology education is effective in FM patients, and whether it is able to influence the impaired endogenous pain inhibition of these patients.	Community	30 patients with FM	Neurophysiology group showed improvement in knowledge of PN, less worrying time, physical function, mental health, general health perception, and lower pain scores compared with self-management group	Small sample, 4 males in the sample
Ittersum et al. ⁴²	Belgium	Randomize controlled trial	PN education vs. relaxation education; Both groups use a 15-pages booklet over 6 weeks, read by participants themselves; To determine whether the 12-week, "Pain Education School" program developed at a Midwestern VA medical center benefited veterans who suffer from chronic or persistent, noncancer pain.	Clinic	105 patients with FM	No differences between two groups and pre-post test, both groups showed no effective changes in pain cognitions, health status in patients with FM	High dropout rates, small sample, not sure how much the participants understand the intervention/ education materials
Costo & Lin ⁴³	USA	Quasi experiment study	Pain Education School Pre-Post test: Once a week, one-hour classes for 12 weeks, participants were not required to attend all sessions, they can choose the topics they like, delivered by multidisciplinary health professionals; To determine whether the 12-week, "Pain Education School" program developed at a Midwestern VA medical center benefited veterans who suffer from chronic or persistent, noncancer pain.	Clinic	206 veterans with chronic pain	Study showed significant difference in pain intensity, readiness for Self-management, experience of pain, and depression by pre-post test	Lack of control group, education sessions are based on patient self-selection, so not all participants finished 12 weeks education

(Continued)

(continued)

Study	Country	Study type	Interventions/study design/study aim	Study setting	Participant	Outcomes	Study limitation
Morlion et al. ⁴⁴	Belgium	Quasi experiment study	Multidisciplinary pain education program Pre-post test; 4 sessions × 2 h over 2 weeks, delivered by multidisciplinary health professionals; A brief intervention to rapid improve core symptoms and complaints for people with chronic noncancer pain; to determine factors associated with improvement defined in terms of change in pain symptoms.	Clinic	63 adults with chronic pain	Study showed improvement in pain symptoms and action-proneness but not in depression and kinesiophobia	Lack of control group

CBT, Cognitive behavior therapy; FM, Fibromyalgia; PN, Pain neurophysiology.

Table 1. Study characteristics.

seven studies contained detailed information related to the above categories in their education programs, while one study has only information in regarding the above categories or features as its full education content.³⁹

Data from this review showed CBT is a common focal point in patient education programs. Five studies included information about CBT in their patient education programs.^{38,40,42–44} However, each program had a different focus on the principle of CBT. This included thoughts and mood management,^{38,40,42} motivation enhancement,^{40,44} psychosocial factors on pain,^{43,44} self-efficacy,^{40,44} and pain acceptance and commitment therapy.⁴³

Data of this review also indicated that Self-management is another common focal point for chronic pain management in patient education programs. Five studies encouraged people to learn skills of Self-management. The Self-management skills included relaxation,^{38,42,44} physical exercises,^{38,40,44} activity pacing, graded exposure and management strategies,^{38,44} goal setting,^{38,40,41} sleep management,^{38,40,43,44} stress management,^{38,40,42,44} relapse prevention,^{40,41} and structured problem solving.^{38,40}

According to the review, PN was not commonly included in the patient education programs when compared with other categories of information for chronic pain management. Two studies had a focus on the PN education.^{41,42} It provided a theory that nociceptive stimuli sent to the brain are not always reflected in pain experience, depending on persons' psychological state of mind and environment. The PN education provided information that tissue damage is necessary for a pain sensation but a pain sensation does not definitely mean tissue damage and the central nervous system has the ability to increase or decrease its sensitivity. In addition, it covers the information of differences between nociception and pain, acute pain and chronic pain, and further how acute pain becomes chronic.^{41,42} Also, the study of Ittersum and his colleagues,⁴² included information of central sensitization as part of PN education.

When we summarize the findings of this review, it showed that the majority of education programs used a combination of information in their educational content. Often the content covered information belonging to two to three categories (as identified above). For example, the education information in Cosio and Lin's study,⁴³ mainly focused on General information and only briefly touched on CBT and PN. In general, General information, CBT, and Self-management were the most common content covered in current education programs. In addition, one study briefly reported the application of "healthy aging" as the part of education intervention for chronic pain management in which "brain health" was emphasized as the theme during the study period of time.³⁹

Study	Education contents			
	General information	CBT as principle	Self-management	PN
Dear et al. ³⁸	✓	✓	✓	
Morone et al. ³⁹	✓			
Chiauzzi et al. ⁴⁰	✓	✓	✓	
Van Oosterwijck et al. ⁴¹			✓	✓
Ittersum et al. ⁴²		✓	✓	✓
Cosio & Lin ⁴³	✓	✓		
Morlion et al. ⁴⁴	✓	✓	✓	

Note: General information: symptoms identification, treatment options, complementary treatments, pain medications, working with health professionals, eating and health, weight management, smoking cessation; CBT as principle: thoughts and mood management, motivation enhancement, psychological factors on pain, self-efficacy, pain acceptance & commitment therapy; Self-management: relaxation, physical exercise, activity pacing, graded exposure, activity management strategy, goal setting, sleep management, stress management, relapse prevention, structured problem solving; PN: based on the book *Explain Pain* by Butler & Moseley⁴⁵ and theory of central sensitization that nociceptive stimuli sent to the brain are not always reflected in pain experience, depending on patient's psychological state of mind and environment. Difference between nociception and pain, Acute pain vs. chronic pain, How acute pain becomes chronic, Potential sustaining factors of central sensitization. CBT, Cognitive behavior therapy; PN, Pain neurophysiology.

Table 2. Education programs—contents.

3.2. How are these education programs delivered?

Various ways were identified in the delivery of patient education programs (Table 3). Workbooks/booklets and face-to-face teaching were the most common ways of delivery format used in patient education programs. Workbooks/booklets were used in four studies. Among them, two studies combined the booklet with online education^{38,40}; One study combined the booklet with face-to-face group education,³⁹ and one study used booklet as the only education medium.⁴² Three studies used face-to-face in group education sessions,^{39,43,44} and only one study used one-to-one and face-to-face delivery formats.⁴¹ Those delivering the patient education programs were from different health disciplines. Instructors involved are psychologists,³⁸ physiotherapists,^{41,44} nurses,⁴⁴ and other health professionals.^{39,43} Two studies did not have an education delivery instructor because the education was either in an online or in a booklet format.^{40,42}

Different formats had been used in education delivery. Workbooks/booklets and face-to-face were the most commonly used education medium and almost 50% of the studies in this review used a combination of two ways in their education.

3.3. What evaluation tools have been used to assess the effectiveness of the education programs for chronic pain management?

There were 19 different measurement tools used for the evaluation of the education programs in selected studies (Table 4). The average number of the evaluation tools

used in a study was 5. The maximum number of tools used in one study⁴⁰ was 8 and the minimum number of tools used was 3 in two studies.^{42,43} The most commonly used tool was the Pain Catastrophizing Scale, which was used in five studies.^{38,40–42,44}

This scoping review found that the pain intensity was not the prime consideration in the evaluation of patient education programs. Regarding the chronic pain management, the studies had interest in the quality of life measurement, reflected by three studies using SF-36 Health Status Inventory.^{39,41,44} The confidence of patients moving with pain was the focus for evaluation of three studies using the Pain Self-Efficacy Questionnaire^{38–40} and four studies using the Kinesiophobia Scale to measure the fear of movement/injury.^{38,40,41,44} Four studies used questionnaires to evaluate the influence of patient education programs to improve participants' depression and anxiety.^{38,40,43,44} Patients' functional status was also evaluated by the Pain Disability Questionnaire, which was adopted in three studies.^{38,40,43,44} Further, participants' improvement in their knowledge of pain medication⁴³, illness perception⁴²; global impression of change⁴⁰; mindfulness³⁹; chronic pain acceptance³⁸; knowledge of PN, spatial summation procedures, pain vigilance and awareness⁴¹; and habitual action-proneness⁴⁴ were also reported.

Selection of the evaluation tools used was influenced by and based on the study population and the education content. For example, the Fibromyalgia Impact Questionnaire was only used in the studies in which participants had fibromyalgia (FM).^{41,42} The Neurophysiology Knowledge Test questionnaire was only used in the study focusing on neurophysiology education.⁴¹

Study	Duration	Frequency	Delivered by	Way of delivery			
				Face-to-Face one-to-one	Face-to-Face in group	Online	booklet
Dear et al. ³⁸	8 weeks	7–10 days × a lesson, for 5 lessons	Psychologist × 2 weekly contact for learning support			✓	✓
Morone et al. ³⁹	8 weeks	1 session × 90 min, once a week	Health professional, not specific		✓		✓
Chiauzzi et al. ⁴⁰	4 weeks	Website group: 20 min × twice a week Text group: on their own pace	N/A			✓	
Van Oosterwijck et al. ⁴¹	2 weeks	1 session × 30 min, once a week	Physiotherapist	✓			✓
Ittersum et al. ⁴²	6 weeks	Read it several times with 1 or 2 days intermissions	N/A				✓
Cosio & Lin ⁴³	12 weeks	1 session × 1 h, once a week	Health professionals from over 20 disciplines		✓		
Morlion et al. ⁴⁴	2 weeks	2 sessions × 2 h per week	A physiotherapist, A pain nurse, and a clinical psychologist		✓		

Note: The duration of the education and the frequency for each session varied between the studies. The duration ranged from 2 weeks to 12 weeks. The frequency of the education sessions varied between twice a week^{40,44}, once a week^{39,41,43}, and 7–10 days for a session at the participants' pace of self-learning.³⁸

Table 3. Education programs —way of delivery.

In summary, there was a broad range of tools used in the evaluation of the education programs. Though the focuses of the studies and the participant were different, the Pain Catastrophizing Scale was the most commonly used evaluation tool in this review.

3.4. What kind of education programs are effective in chronic pain management?

The majority of the studies (6 out of 7) reported that education programs are effective in chronic pain management. Although studies varied in education content, ways of delivery and the disciplinary background of instructors, the majority of the education programs reported positive outcomes in terms of reduction in participants' pain intensity, disability, anxiety, depression, and general health perception (Table 1). Studies that reported the most positive outcomes had information in all four categories (General information, CBT, Self-management, and PN). The study of Ittersum⁴² showed no difference between two education groups and the pre–post education outcomes, and it had a primary focus on PN, and included some information on CBT and Self-management, but did not include General information. In Ittersum et al.'s study,⁴² a 15-page booklet was given to participants so that they read the booklet themselves over 6 weeks with each participant being allowed to ask questions twice about the information they were given. The researchers of that study

acknowledged that they were unsure whether the participants understood the information provided in the booklet and whether participants actually applied it to manage their chronic pain. Another study with same focus on PN⁴¹ did report positive outcomes in improved knowledge of PN, less worrying time, physical function, mental health, general health perception, and lower pain scores.

Three studies with positive outcomes used textbooks in their education programs. However, they all had health professionals' support or direct contact with an instructor during their education sessions. Education content and the way it is delivered appear to be factors in the success of a patient education programs.

The studies selected in this review used different evaluation tools, and the lack of consistency in the tools makes the comparison of education programs a challenging task. The most common tool was the Pain Catastrophizing Scale, which was used in 5 studies. Dear and colleagues' studied³⁸ the most effective patient education program based on this tool, in which they compared the outcomes of different delivery ways of the same education contents through the online and workbook formats. The education content in this study included the General information, CBT, and Self-management, and the program conducted over 8 weeks for 5 lessons with two psychologists' having weekly contact with the participants to support their learning.³⁸ Findings of this scoping review suggest that

Study	Pain disability Index: Roland Morris Disability Questionnaire	Pain Self-Efficacy Questionnaire	Kinesiophobia Scale (Fear of Movement/Injury)	Chronic Pain Acceptance Questionnaire 8-Item	Pain Catastrophizing Scale (pain negative orientation)	Pain Intensity	Quality of life	Mindfulness	Depression and anxiety	Habitual action proneness questionnaire	Global rating: PGIC patient global impression of change	Chronic pain coping inventory	Spatial summation procedures (SSP)	FM impact questionnaire	Pain vigilance and awareness questionnaire	Neurophysiology of pain test, knowledge test	Illness perception questionnaire for FM	Numeric rating scale for pain	Patient pain questionnaire (focus on knowledge of medication)
1 Dear et al. ³⁸	✓	✓	✓	✓	✓	✓				Patient Health Questionnaire (Depression), Generalized Anxiety Disorder✓									✓Wisconsin Brief Pain Questionnaire
2 Morone et al. ³⁹	✓	✓				Short-form McGill Pain Questionnaire	✓, SF-36 Health Status Inventory	✓											
3 Chiauuzzi et al. ⁴⁰	✓Oswestry Disability Questionnaire	✓	✓		✓	Brief pain inventory			✓Depression Anxiety Stress Scales		✓	✓	✓	✓					
4 Van Oosterwijk et al. ⁴¹		✓			✓		✓SF-36 Health Status Inventory					✓	✓	✓	✓	✓			
5 Ittersum et al. ⁴²					✓									✓			✓		
6 Cosio & Lin ⁴³									✓Patient Health Questionnaire									✓	
7 Morlion et al. ⁴⁴			✓		✓		✓SF-36 Health Status Inventory		✓Hospital Anxiety and Depression Scale (HADS)	✓									

Note: FM, Fibromyalgia; HADS, Hospital Anxiety and Depression Scale.

Table 4. Education programs—evaluation tools.

patient education programs can be effective, but the current evidence is inconclusive related to the specific characteristics comprising the best practice, and further research is needed.

In general, most studies reported positive outcomes based on their selected evaluation tools. The effectiveness of chronic pain management seems to be the improved quality of life, not merely focusing on the reduction of pain.

4. Discussion

Overall, there is a dearth of studies that investigate the impact of education programs for people living with chronic pain. The majority of articles identified in this scoping review were related to multidisciplinary pain management programs and therapeutic interventions. Although patient education is important in chronic pain management, the evaluation of its impact on people with chronic pain is not well studied.

This review has identified that the education content of programs designed to support people living with chronic pain primarily falls into four categories. Category one, the General information, provided the explanation of chronic pain, treatment options, and healthy lifestyle. It is observed that even this simple information was found helpful for people living with chronic pain. In this review, five studies contributed information to this category, and they all reported positive outcomes.^{38–40,43,44} It appears that this category of information is needed by people living with chronic pain and could be considered for inpatient education programs in chronic pain management.

Category two, CBT, has been recommended as an effective therapy for chronic pain management,^{46–48} and it has been adopted in a number of multidisciplinary chronic pain management programs.^{13,21,22,49–52} This scoping review found that CBT was used in the majority of the patient education programs. These studies suggested CBT may reduce pain intensity and pain-related distress, anxiety, and improve physical function by decreasing maladaptive thoughts and behaviors to increase self-efficacy skills in their pain management.⁵³ However, treatment gains of CBT have been found to be short term^{54–56} and there is a need for long-term effective interventions.

Category three, Self-management is highly recommended in the literature for managing chronic health conditions⁵⁷ including chronic pain management where it has been found to have some success.^{58–60} This review supported other research⁶¹ which found that Self-management emphasizes the individual's active role in their pain management and is strongly advocated as a major component in

current chronic pain management programs.⁶¹ Self-management prepares and empowers people with chronic pain to take an active role to manage their health over passive reliance on health professional-led care.⁶² To equip people with the knowledge and skills of direct care, education can be used as an effective and economical intervention. However, while Self-management is a popular component in the chronic pain management programs the person's readiness to self-manage needs to be assessed for a successful outcome.⁶³

Category four, PN education, is relatively new for education, but an important area in chronic pain management. PN education is given alternative names such as therapeutic neuroscience education, pain biology education, and pain neuroscience education in various programs.⁶⁴ Here, two studies had contradictory findings regarding the effectiveness of the PN education to people with chronic pain. Both studies were conducted in Belgium with a targeted population of FM and their education programs were based on the theory of a book by Butler & Moseley⁴⁵ titled *Explain Pain*. One study showed positive outcomes⁴¹ whereas the other did not.⁴² This may have been explained by the delivery mode—positive outcomes reported when the instruction was given by face-to-face, one-to-one teaching, and additional telephone follow-up to make sure that all participants understood the information they were given.⁴¹ Conversely, the study that used a booklet as the only way to deliver the education (inclusive of two opportunities to ask questions pertaining to the information participants were given) was found to be ineffective.⁴² Understanding PN can be challenging for people with chronic pain who might lack the capacity to understand its complexity.⁶⁵ Health professionals can also find PN challenging to teach because the concept is commonly confused with CBT and gate control theory.⁶⁴ But there is conclusive evidence that appropriate PN education can reduce chronic pain.^{66–69} Most studies have the small sample size, and so larger and more pragmatic clinical trials are needed.

Regarding the education delivery format to patient, website-based education may result in some potential outcome in chronic pain management. This review showed that the delivery formats of the education programs does not likely to affect the educational outcomes as most programs with different delivery formats had positive outcomes. Chronic pain is prevalent and has a significant impact on healthcare resources. The long waiting list and the expensive cost are the problems faced by healthcare organizations.³⁰ People who attend a pain management program have a pain history of nearly 10 years.⁷⁰ So, an effective and easily delivered

intervention program is urgently required for this population. The internet-based chronic pain education programs had its advantages. With the widespread use of the internet and smartphones, people with chronic pain can easily access the education online. Compared with the traditional face-to-face classes, online education has a low cost for both the patient and the health organizations.^{71,72} The flexibility of online education benefits those who are physically unable to attend the face-to-face classes due to the illness, family commitment, or other reasons. It provides the equal opportunity to vulnerable section of the people to access the pain management services.

A variety of evaluation tools are used to measure the effectiveness of education programs. People in the community with chronic pain seek pain management programs with expectation that they will benefit from participation. However, in reality, not all participants will benefit, and not all positive benefits will be sustainable. This is reflected in a shift from focusing on measuring pain relief to evaluating improved quality of life despite pain. Of the 19 evaluation tools identified during this review, only two measured pain intensity using short-form McGill Pain Questionnaire and brief pain inventory (Morone et al.³⁹; Chiauuzzi et al.⁴⁰). Current practice seems to equate effectiveness of pain management programs to the improvement of participants' physical function and quality of life and a positive outcome is not just about the cessation of pain.

Contemporary chronic pain management programs encourage participants to take an active role in managing their condition. Those with chronic pain who are focused on pain relief outcomes are more likely to be passive recipients of care and rely on health professionals to manage their pain. This suggests that a successful pain management program needs to screen participants to assess whether they need additional education regarding expectations and Self-management.

A biopsychosocial model is commonly used to manage chronic pain, so the evaluation of the intervention in such model should consider all the changes from bio, psycho, and social aspects. Therefore, both the

subjective and objective measurements should be considered in the evaluation.^{27,73} Pain is a subjective experience, so it is unclear whether objective measurements can really reflect the subjective experience of pain.

The variety of the evaluation tools used in studies indicates that there is a lack of simple and effective standardized tools for the evaluation of the education programs in chronic pain management.^{74,75} In this review, three studies used SF-36 health status inventory as the assessment tool for evaluation of the quality of life.^{39,41,44} However, SF-36 may not be sensitive enough to measure the quality of life for people with chronic pain.⁷⁶ There is an urgent need to clarify what is meant by effective in chronic pain management and what tools should be used in the evaluation of the interventions for chronic pain management. Without standardized evaluation tools, positive outcomes do not guarantee the effectiveness of the interventions in chronic pain management.

5. Conclusions

Findings of this scoping review suggest that patient education programs can be effective, but the current evidence is inconclusive regarding to what features comprises best practice in the content, delivery mode, and timing (length and follow-up) of programs. Further research is needed using standardized evaluation tools to identify best practice models and recognize the shift from focusing on measuring pain relief to evaluating the improved quality of life for those living with chronic pain.

This review provided useful information for health practitioners to consider improving patient education programs for chronic pain management. Further research areas for chronic pain management were also indicated.

Ethical approval

Ethical issues are not involved in this paper.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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