Pain Management Nursing 21 (2020) 157–164

Contents lists available at ScienceDirect

Pain Management Nursing

journal homepage: www.painmanagementnursing.org

Original Article

How Patient Education Influences Utilization of Nonpharmacological Modalities for Persistent Pain Management: An Integrative Review

Iquo N. Andrews-Cooper, DNP, APRN, FNP-C [*], Sharon L. Kozachik, PhD, RN, FAAN [†]

[*] Johns Hopkins School of Nursing, NOVA Interventional Pain Management, Edgewood, Maryland
[†] Johns Hopkins School of Nursing, Baltimore, Maryland

ARTICLE INFO

Article history:
Received 4 May 2018
Received in revised form
24 June 2019
Accepted 30 June 2019

ABSTRACT

Objectives: Opioid analgesic misuse and abuse has given rise to an epidemic that has added to an increase in opioid-related overdoses and deaths. Adults with persistent noncancer pain (PNCP) are primarily treated with opioid analgesics. Many remain on these medications long term. Most of these patients are unaware of other effective measures for managing PNCP, such as nonpharmacologic modalities (NPMs). This lack of familiarity with NPMs presents a key contributor to the problem of NPM underuse among adult PNCP patients. This integrative review sought to identify key factors that contribute to NPMs underuse and the effect of education on patients' adoption or use for PNCP management.
Design: Integrative review.
Data Sources: A literature search was conducted using PubMed, CINAHL, Embase, Cochrane, and hand-searching of the literature published between 2002 and November 2017.
Review/Analysis Methods: Systematic screening using the Johns Hopkins Nursing evidence appraisal tools yielded articles that were analyzed and synthesized to identify themes, and patterns.
Results: Nineteen research articles were identified with these main themes: NPMs are effective in PNCP management, lack of familiarity with NPMs influences patients' willingness to try them, and access to local NPMs must be addressed to facilitate use.
Conclusions: Findings suggest that patient education about NPMs has the potential to motivate patients to try these modalities, which may increase overall use of NPMs for PCNP. Nurses could play a vital role in ensuring evidence-based NPMs are introduced to PNCP patients, which could increase patients' use of these measures and improve outcomes.

Persistent noncancer pain is a complex category of pain that is unrelated to cancer or its treatment, end of life, or palliative care that is present for 3 or more months (Chou et al., 2009; Dowell, Haegerich, & Chou, 2016; Staats & Wallace, 2015). Nicholson and Passik described persistent noncancer pain (PNCP) as "a symptom of many diseases" presenting often without an exact cause (Nicholson & Passik, 2007, p. 1029) (Nicholson & Passik, 2007). In the United States it is estimated that nearly 90 million persons are negatively affected by PNCP, especially by its impact on physical, mental, emotional, and financial aspects of life (Bonakdar, 2017; Dowell et al., 2016; Lapane, Quilliam, Benson, Chow, & Kim, 2014).

Persistent noncancer pain is prevalent in the adult population, affecting approximately 11% of this group. Within this set, more than 30% reported a "pain-related" condition (Dowell et al., 2016; Lapane et al., 2014, p. 333). PNCP may contribute to associated physical and mental health conditions such as sleep problems, anxiety, depression, obesity, and diabetes, all of which could lead to functional disabilities and ultimately affect work productivity and quality of life (QOL) (Bonakdar, 2017; Cheatle, 2016; Lapane et al., 2014).

Opioid analgesics are traditionally used as the mainstay treatment for PNCP and are commonly prescribed to 1 in 5 patients who present for a pain evaluation (Bonakdar, 2017; Chou et al., 2009; Dowell et al., 2016). Although opioid analgesics provide important benefits for acute pain, their long-term use is speculated as a contributor to the increase in opioid analgesic misuse, opioid addiction, and overdose, often leading to death (Cheatle, 2016; Chou et al., 2009; Dowell et al., 2016). Thus it is imperative that alternative

Address correspondence to Iquo N. Andrews-Cooper, DNP, APRN, FNP-C, Johns Hopkins School of Nursing, Ashley Treatment, Inc., 800 Tydings Lane, Havre de Grace, MD 21078.
E-mail address: iandrew3@jhu.edu (I.N. Andrews-Cooper).

https://doi.org/10.1016/j.pmn.2019.06.016
1524-9042/

pain relief strategies be integrated into routine practices to facilitate analgesia and reduce reliance solely on opioid analgesics.

Responding to these adverse events, the Centers for Disease Control and Prevention (CDC) developed guidelines for the management of PNCP to include the use of nonpharmacological modalities (NPMs) (Dowell et al., 2016). NPMs have been reported to have encouraging and notable results in PNCP because they address pain from a multifaceted and patient-centered approach (Chang, Fillingim, Hurley, & Schmidt, 2015; Chou et al., 2009; Passik, 2009; Staats & Wallace, 2015). These approaches include the use of interventional treatments, complementary and alternative medicine (CAM), and psychological support (Chang et al., 2015; Kirsh & Fishman, 2011). Patient outcomes such as pain severity and QOL are more likely to improve with the integration of NPMs as part of their treatment regimen than with pain medications alone (Kirsh & Fishman, 2011).

NPMs comprise of wide array of treatments designed to reduce pain severity, improve physical mobility, and enhance overall QOL (Dowell et al., 2016). NPMs include self-management skills, physical therapy, massage therapy, osteopathic spinal manipulation, cognitive behavioral therapy, mindfulness, biofeedback, Reiki, and prayer (Bruckenthal, 2010; Cosio & Lin, 2015; National Institute of Health and National Center for Complementary and Integrative Health, 2017; Shengelia et al., 2013).

Although NPMs have been found to have great promise in relieving PNCP, they continue to remain underused by patients and underprescribed by providers. This underuse in persons with PNCP may be due to a lack of knowledge (unawareness or unfamiliarity) of these treatment options (Becker et al., 2017; Park, Lavin, & Couturier, 2014; Shengelia et al., 2013). Numerous studies have described the importance of implementing NPMs in PNCP management and the need for NPMs integration as part of the treatment plan (Bonakdar, 2017; Chou et al., 2009; Dowell et al., 2016; Kirsh & Fishman, 2011). However, few studies have focused on the importance of patient education on NPM use and its potential to promote NPMs adoption in PNCP management. Patient education was also identified by the Institute of Medicine (2011) as a vital link between patients' utilization of NPMs and effective persistent pain management. Thus it seems likely that the lack of patient education or knowledge about NPMs might contribute to the decrease in their use. The purpose of this integrative review is to (1) identify key factors that may influence and contribute to the underuse of NPMs in PNCP management; (2) explore the effect of NPM education on patients' familiarity with, willingness to try, and adoption of these modalities; and (3) explore the effects of NPM education on patient outcomes related to pain severity and overall opioid use. The clinical question guiding this review is the following: In adult patients with PNCP, how will NPM education compared with usual care affect their willingness to try these modalities?

Methods

An integrative review method was used to extract data for analysis and synthesis, then organized by patterns and themes described by Whittemore and Knafl (2005). The search was conducted using the following data sources: PubMed, CINAHL, Embase, and Cochrane. Search terms included “persistent pain,” “patient education,” “adults,” “chronic pain management,” “nonpharmacological,” “treatment,” and “underuse.” The word “nonpharmacological” was not recognized in PubMed MesH so “alternative and integrative medicine” was used. Embase also preferred the use of “alternative medicine” over “nonpharmacological.” Relevant articles published between 2002 and November 2017 were included in this review. An extensive search strategy is available on request.

Inclusion criteria consisted of evidence published in peer-reviewed journals between 2002 and 2017 in which the effects of patient education on NPM use was explored in adults, aged 18 years or older, seeking care for PNCP in an outpatient setting. Clinical practice guidelines for PNCP were also included. All evidence had to be written in the English language. Excluded from the search were perioperative pain management, inpatient or hospital settings, cancer-related treatments, pharmacologic treatments, and articles not referencing patient education or NPM/CAM education. Also excluded were non–full text, non-English, and abstract-only articles. In addition to electronic searches, hand searches of articles were conducted by reviewing the reference sections of identified articles that met the inclusion criteria. Articles published by experts in the field of pain management were also searched for by name. One reviewer conducted the search and review process.

The quality and strength of eligible studies were individually evaluated using the Johns Hopkins Nursing Evidence Appraisal Tools for Research and Non-research Evidence (Dearholt & Dang, 2012). The strength of the evidence was graded as a level I (experimental study and meta-analysis of randomized controlled trials), level II (quasi-experimental study), or level III (nonexperimental study, qualitative study, or meta-synthesis). The quality of the evidence was rated using the following rating scale: A = high, B = good, C = low/major flaws. Table 1 includes the quality and rating for each study. One reviewer conducted the evidence appraisal.

Results

A total of 416 articles were retrieved for further examination, including 396 yielded citations from the database search and 20 articles gathered from hand searches from scanning references. After screening for duplicates, 34 articles were removed. Another 167 articles were culled after title and abstract review due to topic relevance, practice setting variances, and wrong patient population, and 139 full-text articles were further excluded because of language difference, focus on provider education, incorrect setting, and pediatric studies. Nineteen articles were synthesized for this review. A complete list of reasons for exclusion is depicted in a PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) diagram (Fig. 1). A full description of the evidence is summarized in Table 1.

A total of 19 articles met inclusion criteria and are presented in this review. Of those assessed, two were randomized controlled trials, eight were systematic reviews with meta-analyses, three were quasi-experimental studies, one used a nonexperimental design, and five were qualitative studies. The mean sample size was of the quantitative studies was 72. Of the studies that reported on age, the mean age was 60 (range 16-74). Participants were mostly Caucasian, well-educated women ranging in age between 45 and 55 years. English was the primary language among the participants; however, one study was conducted with only Spanish-speaking participants (Beltran-Alacreu, Lopez-de-Uralde-Villanueva, Fernandez-Carnero, & La-Touche, 2015). Most of the studies were conducted in outpatient settings. A total of four studies recruited participants from the U.S. Department of Veterans Affairs medical center (Becker et al., 2017; Cosio & Lin, 2015; Giannitrapani et al., 2017; Simmonds, Finley, Pugh, & Turner, 2015). The location of pain varied within and among the studies such as low back pain, neck pain, osteoarthritis, and fibromyalgia.

There were inconsistent theoretical definitions or descriptions of patient education, as well as differences in how these concepts were operationalized. The terms *NPM* and *CAM* were used interchangeably in all the studies specific to patient education. Regarding barriers that affect NPMs use for PNCP management, 10 studies identified key factors: lack of familiarity or education;

Table 1
Summary of Evidence

Author (Year)	Design	Sample	Educational Intervention	Other Types of NPMs	Major Findings	Evidence Level & Quality
Ainpradub, Sitthipornvorakul, Janwantanakul, & Van der Beek (2016)	Systematic review with Meta-analysis	N = 15 RCTs, male and female patients, age unspecified	TPE, SME Structured content included	Back programs Solution-finding approach Exercise	Education alone did not seem to be enough in preventing and treating low back and neck pain. Knowledge through self-management and patient education may increase use of NPMs. Selecting educational topics such as activities and coping skills is beneficial.	1/B
Beltran-Alacreu, Lopez-de-Uralde-Villanueva, Fernandez-Carnero, & La-Touche (2015)	RCT	N = 45, patients women > men, age range 18-65, mean age 43.5	TPE PNE	Manual therapy (MT) Therapeutic exercise (TEX) protocol Self-management approaches	Manual therapy and combined manual therapy with TPE found statistically significant differences. Combined treatment of MT, TEX, and education is effective.	1/B
Clarke, Ryan, & Martin (2011)	Systematic review with meta-analysis	N = 2 RCTs, patients, gender unknown, age ≥18	PNE		PNE produced statistically significant but clinically small improvements in short-term pain of 5 mm on a 100-mm scale	1/B
Engers et al. (2008)	Systematic review with meta-analysis	N = 24 RCTs, more female patients than male patients, mean age 40	Individual patient education (IPE)	Activities Coping skills	IPE was less effective than more intensive treatment for patients with chronic LBP patients. Effectiveness of IPE remains unclear in chronic LBP patients.	1/A
Geneen et al. (2015)	Systematic review with meta-analysis	N = 9 RCTs, more female patients than male patients, age 18+	PNE SME Educational support	Physical activity	Studies found no improvement in pain and disability with PNE alone. PNE should be used with other interventions for pain management. Evidence of a decrease in disability with PNE. Evidence of an increase in knowledge about pain after PNE.	1/B
Gross et al. (2012)	Systematic review with meta-analysis	N = 15 RCTs, patients' gender unspecified, age unspecified	TPE Self-care strategies		Only 1 trial was reported effectiveness of educational intervention; most did not indicate any benefit of self-care strategies.	1/B
Heymans, Van Tulder, Esmail, Bombardier, & Koes (2004)	Systematic review with meta-analysis	N = 19 RCTs, patients' gender unspecified, age 16+	Back school—structured program		Back schools in occupational setting were more effective than other treatment, including placebo.	1/A
Kroon et al. (2014)	Systematic review with meta-analysis	N = 29 RCTs, more female patients than male patients, mean age 68 years	Self-management (SM)—structured program		SM programs probably provide small benefits up to 21 months. SM programs may lead to small reduction in pain	1/A
Morone, Rollman, Moore, Qin, & Weiner (2009)	RCT	N = 40 community-dwelling older adults, gender unspecified, age > 65	Health education program—structured program	8-week mindfulness meditation group Back school Chiropractic Physical therapy	Evidence indicated good response to all 3 areas of outcome measures (disability, psychological function, pain severity); 67% (n = 12) of patients in the control group reported at least a minimally improved pain symptom, whereas 81% (n = 13) of the meditation group reported at least a minimal improvement in back pain symptoms.	1/B
Parriera et al. (2017)	Systematic review with meta-analysis	N = 30, female patients only (3 studies), male-only (1 study), age range 18-70	Back school	Exercise activities	Evidence supported back school for pain reduction at the short-term follow-up. Benefits of back school remain uncertain.	1/A

(*continued on next page*)

Table 1 (*continued*)

Author (Year)	Design	Sample	Educational Intervention	Other Types of NPMs	Major Findings	Evidence Level & Quality
Cosio & Lin (2015).	Quasi-experimental (pre-post design)	N = 103 veterans, more male patients than female patients, urban > rural areas (98:48), mean age 55-64	12-week (1-hour classes) pain education school—structured program	Mind/body medicine, natural/ biologically based, manipulation/body based, and energy medicine, with information on available treatments and how to access these modalities through various clinics	Chiropractic, massage therapy, and spirituality/ religion were the top three CAMs used. Pain education school program had a small to moderate effect in increasing CAM use. Findings were consistent with the notion that if individuals are provided with adequate education, they will self-manage using the tools provided.	II/B
Fouladbakhsh, Szczesny, Jenuwine, & Vallerand (2011)	Quasi-experimental	N = 53, older adults in rural communities, mostly women, predominantly Caucasian, mean age 70	Educational programs: 30 minutes of educational session for 2 weeks Self-management	Heat Cold Relaxation breathing	Nondrug methods diminish pain perception by reducing intensity and increasing pain tolerance, reduce pain-related distress, strengthen coping abilities, and give the patient and family a sense of control over pain. Results indicated a significant increase in use of three nondrug therapies (heat, cold, and relaxation breathing).	II/B
Mehl-Madrona, Mainguy, & Plummer (2016).	Quasi-experimental	N = 414 patients in rural community, more women than men, >40% college educated, mean age 45	2-hour group medical visits (GMV) program	Mindfulness techniques, movement, guided imagery relaxation training, yoga qigong tai chi	Education changed patient attitudes toward pain. Pain intensity reduction was noted after education ($p = .001$). Quality-of-life rating was statistically significant ($p = .007$).	II/B
Becker et al. (2017)	Qualitative study Descriptive methods with thematic analysis	N = 52, more women than men, mean age 55	Nominal Group Technique (NGT)	Focus on effects of NPMs on chronic pain, including barriers	Barriers included: Lack of NPM awareness or knowledge (both providers and patients) and access, including transportation, scheduling, out-of-pocket cost, and available local resources.	III/B
Giannitrapani et al. (2017)	Qualitative study Semistructured interview	N = 60 at two VAMC	Multidisciplinary focus groups		Barriers to NPMs included access to NPMs (temporal), geographic location (distance patients must travel), Financial (out-of-pocket costs for patients), cultural (insufficient provider buy-in), and concerns with digital connectivity (older patients hesitant to use these methods).	III/A
Park, Hirz, Manotas, & Hooyman (2013)	Qualitative study Semistructured face-to-face interviews	N = 44 adults aged 60 or older, women (79.5%); education level: 47% college graduate or higher; mean age 70		CBT Exercise activity	Barriers to NPMs use include limited insurance coverage for treatments, individual patients' financial instability (fixed income), unavailability of certain treatments, and transportation problems; failure of provider to recommend or provide information on NPMs; and providers attitude regarding NPMs. Internal barriers included depression, lack of understanding, fear of pain, fatigue or injury from exercises or physical activity, embarrassment/self-consciousness, and lack of motivation and faith in effectiveness of NPMs.	III/A

Table 1 (*continued*)

Author (Year)	Design	Sample	Educational Intervention	Other Types of NPMs	Major Findings	Evidence Level & Quality
Park, Lavin, & Couturier (2014)	Qualitative study Descriptive cross-section design	N = 281, older community-dwelling adults, more women than men (77%: 24%), age > 60, mean age 70		Prayer Exercise activity Pain support groups Hypnotherapy Biofeedback Guided imagery	Barriers: Cost remains a concern for elderly patients. Provider perception influenced their recommendation of psychological approaches. Prayer was most commonly used by ethnic minority groups. Negative association was found between high pain intensity and use of exercise (fear). Combination of psychological and physical NPMs are worth considering in the elderly population. Some NPMs were not used by participants due to a lack of education.	III/A
Parlar, Fadiloglu, Argon, Tokem, & Keser (2013)	Nonexperimental predictive correlational design	N = 60 female patients, mean age 52-54 ± 10 years	Pain management education programs (1 hour long)	Massage, exercising, CAM methods such as breathing exercises to control stress	Use of pain management methods increased from 8 to 11 after the education program. Increase use of massage, exercising, CAM methods such as breathing exercises to control stress.	III/B
Simmonds, Finley, Pugh, & Turner (2015)	Qualitative review grounded theory	N = 25 veterans, 68% male, mostly white, age range 39-70, mean age 54		Exercise activities	Barriers included lack of information about resources, limited availability, uncovered expenses, poor education, lack of training, concerns about worsening pain, limited insurance coverage for services, providers mostly focused on pharmacologic aspect of pain management, and lack of personal motivation (patient). Depression and lack of initiative prevented some from using NPMs. Fear of movement (avoidance of exercise) correlated to poor outcomes.	III/A

NPM = nonpharmacologic modalities; RCT = randomized controlled trial; TPE = therapeutic patient education; SME = self-management education; PNE = pain neuroscience education; LBP = low back pain; VAMC = Veterans Affairs Medical Center; CBT = cognitive behavioral therapy; CAM = complementary and alternative modalities.

access to NPMs; and patients' beliefs, attitudes, and expectations that could influence their willingness to try NPMs (Becker et al., 2017; Cosio & Lin, 2015; Giannitrapani et al., 2017; Gross et al., 2012; Mehl-Madrona, Mainguy, & Plummer, 2016; Park & Hughes, 2012; Park et al., 2014; Park, Hirz, Manotas, & Hooyman, 2013; Parlar, Fadiloglu, Argon, Tokem, & Keser, 2013; Simmonds et al., 2015). An integration of the findings from these studies suggest that these factors presented significant barriers to NPM use or adoption.

Several forms of educational interventions were identified in this review. Individual patient education consists of sharing information, activities, and coping skills tailored to each patient's pain experience (Engers et al., 2008); therapeutic patient education is a type of education provided to assist patients with learning and developing various skills to facilitate healthy behaviors (Ainpradub, Sitthipornvorakul, Janwantanakul, & Van der Beek, 2016; Beltran-Alacreu et al., 2015; Gross et al., 2012); self-management education is described as interventions specifically targeted at patient education and behavior modification (Ainpradub et al., 2016; Cosio & Lin, 2015; Kroon et al., 2014; Parlar et al., 2013); pain neuroscience education (PNE) focuses on teaching patients about the "neurobiology and neurophysiology of pain" with the goal of increasing comprehension of their pain experience (Clarke, Ryan, & Martin, 2011 p. 544; Geneen et al., 2015). Back schools, adapted from the Swedish back school model, are used to treat back pain and consist of both exercise and education (Heymans, Van Tulder, Esmail, Bombardier, & Koes, 2004; Parriera et al., 2017); and pain education school was used in one Veterans Affairs study to offer veterans information about the basic principles of pain prevention and relief and share different types of NPMs available for pain management (Cosio & Lin, 2015). Other variants of these forms of education include group medical visits program (Mehl-Madrona et al., 2016), small group sessions (Fouladbakhsh, Szczesny, Jenuwine, & Vallerand, 2011), and mind-body programs (Morone, Rollman, Moore, Qin, & Weiner, 2009).

Factors Influencing NPMs Adoption

Lack of Education or Familiarity

Among studies that addressed barriers to NPMs use, the evidence suggests that a lack of education or awareness about NPMs greatly influenced patients' willingness to try them in PNCP management. Three studies specifically examined the impact of education on use of NPMs and found that patients' use of NPMs increased significantly after an educational session about these modalities (Cosio & Lin, 2015; Fouladbakhsh et al., 2011; Parlar et al., 2013). Participants verbalized that they would use NPMs if information was provided on what was available, how it worked,

and how to access them (Becker et al., 2017; Bruckenthal, 2010; Cosio & Lin, 2015; Park et al., 2013, 2014; Simmonds et al., 2015; Taylor, Giannitrapani, Yuan, & Marshall, 2017).

Access to NPMs

Access to NPMs also affected patients' ability to participate in these treatments. Six studies (Becker et al., 2017; Bruckenthal, 2010; Giannitrapani et al., 2017; Park et al., 2013, 2014; Simmonds et al., 2015) expanded on subfactors that further affect access, including transportation issues, out-of-pocket costs, limited insurance coverage, scheduling conflicts (especially with appointments for other comorbid conditions), and limited financial resources (fixed income).

Patients' Beliefs and Attitudes

Patients beliefs and attitudes relate to their motivation or level of engagement in NPMs (Becker et al., 2017; Mehl-Madrona et al., 2016; Park et al., 2013; Simmonds et al., 2015;). Evidence suggests that if patients do not believe that NPMs are effective, possess a negative attitude toward NPMs, or regard certain NPMs as against their personal beliefs, they may be less likely to use these treatments (Cosio & Lin, 2015; Park et al., 2013, 2014). Patients who practice spirituality are more likely to pray or use centering techniques to channel energy for healing (Cosio & Lin, 2015; Park et al., 2013, 2014).

Patients' Expectations

Patients' expectations may influence outcomes related to pain relief (Becker et al., 2017; Passik, 2009). If patients' expectancies for recovery and health are not well established or substantial, their actual outcome may be borderline to low, which ultimately affects their use of NPMs (Becker et al., 2017). Patient expectations could also be influenced by their beliefs about NPMs' effectiveness, discussed earlier, which may play a role in their subsequent use of NPMs (Cosio & Lin, 2015; Park et al., 2013, 2014).

Effects of NPM Adoption on Outcomes

Pain Outcomes and Self-Management

Among the eight studies that compared education (individual patient education, therapeutic patient education, self-management education) (Ainpradub et al., 2016; Clarke et al., 2011; Engers et al., 2008; Geneen et al., 2015; Gross et al., 2012; Kroon et al., 2014; Morone et al., 2009; Parriera et al., 2017), the results from three suggest that education without hands-on learning or active learning was not effective in improving outcomes of pain severity and function (Ainpradub et al., 2016; Geneen et al., 2015; Gross et al., 2012). However, Ainpradub et al. (2016) also found that certain topics for chronic low back pain (CLBP) reinforced self-management skills that may be of long-term benefit in improving both self-esteem and QOL. Of the studies that solely focused on PNE, all found small improvements in pain severity, and quality of life (Clarke et al., 2011; Geneen et al., 2015). Clinically significant findings on patient outcomes of pain severity were noted among studies that combined PNE with manual therapy, exercises, or other therapies (Beltran-Alacreu et al., 2015). The evidence suggests that combining education (any form) with NPMs significantly improves patient outcomes compared with education alone. However, back schools and their effect on CLBP intensity and disability had inconsistent results. Heymans et al. (2004) found that back schools in occupational settings were more effective than placebo and other treatments. In contrast, Parriera et al. (2017) found the benefits of back schools in the relief of CLBP to be uncertain. This may have occurred because of the varying topics, formats, instruction methods, or mediums used during the back schools.

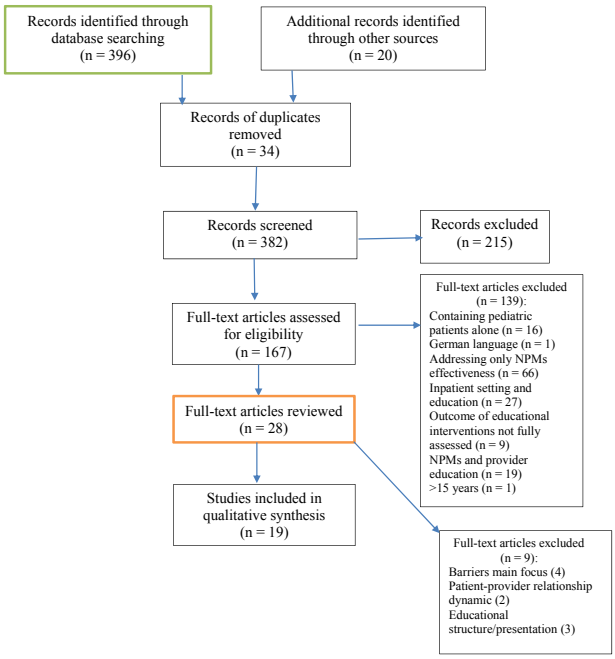

Figure 1. PRISMA diagram. NPM = nonpharmacologic modalities.

Pain Outcomes and Opioid Use

Three studies reported positive effects of patient education on NPMs use for PNCP management (Cosio & Lin, 2015; Fouladbakhsh et al., 2011; Mehl-Madrona et al., 2016). In all three studies, participants increased their use of NPMs/CAMs with statistically significant results for acupuncture ($p = .01$), biofeedback/relaxation ($p = .01$), yoga movement ($p = .01$), and spinal manipulation ($p = .02$). Educational programs improved patients' pain intensity scores for patients who elected to use nondrug therapies (heat, cold, and relaxation breathing techniques) (Fouladbakhsh et al., 2011). Pain scores improved as patients used NPMs more often. The study reported a decrease in overall opioid usage with the integration of NPMs/CAMs in PNCP management (18 out of 42 patients reduced daily opioid intake) (Mehl-Madrona et al., 2016). The average initial dose before the start of the program was 21 morphine milligram equivalents (MME), which was reduced to 13 MME after program conclusion (Mehl-Madrona et al., 2016). About 20% of the participants ceased opioid analgesic use on completion of the program (Mehl-Madrona et al., 2016).

Willingness to Use NPMs

Although most of the studies did not directly measure willingness or readiness to use NPMs, patients' desire and interest to learn more about NPMs was stated within the studies. After education, many patients communicated a positive interest and open-mindedness with regards to implementing NPMs, especially that the potential for improvement of outcomes existed (Becker et al., 2017; Cosio & Lin, 2015; Park et al., 2013, 2014; Simmonds et al., 2015).

Discussion

Evidence supports that many patients are not using NPMs or any of its components for PNCP management. It also suggests that interest is present but implementation is lacking in many outpatient settings (Becker et al., 2017; Cosio & Lin, 2015; Park et al., 2013, 2014; Simmonds et al., 2015). Patients' willingness to try NPMs for PNCP management is greatly influenced by familiarity or knowledge. Knowledge is achieved through patient education.

Patient education adds to health literacy, which further empowers patients to use information positively and productively to modify behavior (Ainpradub et al., 2016; Mehl-Madrona et al., 2016).

The evidence suggests formulating an education program structured specifically for PNCP patients that addresses the following areas: understanding pain and their response to pain; types of NPMs; role of NPMs as an adjunct to other therapies; how NPMs can help with symptom management; ways to access NPMs locally; and assistance with facilitation of NPM treatment through third-party payers, affordable NPMs options, self-management and coping skills, and regular follow-up visits. Nurses can educate patients on these topics and thereby influence willingness to adopt some of these modalities in PNCP management. An educational program should also be patient-centered, culturally competent, and delivered in a format that is appropriate and acceptable to the patient (Taylor et al., 2017). These results present an opportunity for further inquiry and research to assess the extent to which education about NPMs influences patients' willingness to use these modalities in the management of PCNP.

Limitations

This review has several limitations. Patient education was operationalized differently within the articles reviewed. Length of education sessions and content presented also varied from study to study. Most of the participants in the studies were well-educated Caucasian women, which may limit the generalizability of findings. Another limitation is that only one person extracted and synthesized the data, which may have biased the results and interpretation. Rigorous research is also needed to test the effectiveness of educational intervention over time (>6 months, 1-2 years, etc.). More high-quality studies are needed to buttress the effectiveness of NPMs and their use in PNCP.

Implications for Nursing

This review has several implications for nursing practice. Nurses interact with patients before the pain assessment and evaluation encounter with the provider. Nurses can provide a comprehensive pain management assessment to include an inquiry about patients use of NPMs. This would reveal the patients' level of familiarity or lack thereof regarding NPMs use in PNCP management. This provides an opportunity for nurses to educate patients, which is a vital role in PNCP management. Nurses could also facilitate discussions, assist with specialty referrals, and provide clarification concerning local NPMs, which could contribute to the improvement in outcomes for PNCP patients. NPM education has the potential to change how adult PNCP patients view their current pain experience. It could also provide hope and encourage patients' self-efficacy notwithstanding the challenges that accompany living with PNCP.

Conclusions

A patient-centered educational program about pain, pain response, pain neuroscience, and the adjunctive role of NPMs in persistent pain management shows great promise in influencing patients' willingness to try NPMs. Evidence also suggests that education should include active learning strategies to increase adoption of NPMs. Nurses are well positioned to lead such an educational program, which could promote comfort, optimize functioning, and improve quality of life.

References

Ainpradub, K., Sitthipornvorakul, E., Janwantanakul, P., & Van der Beek, A. J. (2016). Effects of education on non-specific neck and low back pain: A meta-analysis of randomized trials. *Manual Therapy, 22*, 31–41.

Becker, W. C., Dorflinger, L., Edmond, S. N., Islam, L., Heapy, A. A., & Fraenkel, L. (2017). Barriers and facilitators to use of non-pharmacological treatments in chronic pain. *BMC Family Practice, 18*(41), 1–8.

Beltran-Alacreu, H., Lopez-de-Uralde-Villanueva, I., Fernandez-Carnero, J., & La-Touche, R. (2015). Manual therapy, therapeutic patient education, and therapeutic exercise, an effective multimodal treatment of nonspecific chronic neck pain: A randomized controlled trial. *American Journal of Physical Medicine and Rehabilitation, 94*(10), 887–897.

Bonakdar, R. A. (2017). Integrative pain management. *Medical Clinics of North America, 101*(2017), 987–1004.

Bruckenthal, P. (2010). Integrating nonpharmacological and alternative strategies into a comprehensive management approach for older adults with pain. *Pain Management Nursing, 11*(2), s23–s31.

Chang, K. L., Fillingim, R., Hurley, R. W., & Schmidt, S. (2015). Chronic pain management. Retrieved from http://www.aafp.org/test/fpcomp/FP-E_432/pt1.html. (Accessed 13 November 2017).

Cheatle, M. D. (2016). Biopsychosocial approach to assessing and managing patients with chronic pain. *Medical Clinics of North America, 100*, 43–53.

Chou, R., Fanciullo, G. J., Fine, P. G., Adler, J. A., Ballantyne, J. C., Davies, P., Donovan, M. I., Fishbain, D. A., Foley, K. M., Fudin, J., Gilson, A. M., Kelter, A., Mauskop, A., O'Connor, P. G., Passik, S. D., Pasternak, G. W., Portenoy, R. K., Rich, B. A., Roberts, R. G., Todd, K. H., & Miaskowski, C. (2009). Clinical guidelines for the use of chronic opioid therapy in chronic noncancer pain. *Journal of Pain, 10*(2), 113–130.

Clarke, C. L., Ryan, C. G., & Martin, D. J. (2011). Pain neurophysiology education for the management of individuals with chronic low back pain: A systematic review and meta-analysis. *Manual Therapy, 16*(2011), 544–549.

Cosio, D., & Lin, E. H. (2015). Effects of a pain education program in complementary and alternative medicine treatment utilization at a VA medical center. *Complementary Therapies in Medicine, 23*, 413–422.

Dearholt, S. L., & Dang, D. (2012). In *John's Hopkins Nursing evidence-based practice: Model and guidelines* (2nd ed.). Indianapolis, IN: Sigma Theta Tau International.

Dowell, D., Haegerich, T. M., & Chou, R. (2016). CDC guidelines for prescribing opioids for chronic pain-United States, 2016. *The Journal of the American Medical Association, 315*(15), 1624–1645.

Engers, A. J., Jellema, P., Wensing, M., Van der Windt, D. A., Grol, R., & Van Tulder, M. W. (2008). Individual patient education for low back pain. *Cochrane Database of Systematic Reviews, 1*, CD004057.

Fouladbakhsh, J. M., Szczesny, S., Jenuwine, E. S., & Vallerand, A. H. (2011). Nondrug therapies for pain management among rural older adults. *Pain Management Nursing, 12*(2), 70–81.

Geneen, L. J., Martin, D. J., Adams, N., Clarke, C., Dunbar, M., Jones, D., McNamee, P., Schofield, P., & Smith, B. H. (2015). Effects of education to facilitate knowledge about chronic pain for adults: A systematic review with meta-analysis. *Systematic Reviews, 4*(132), 1–21.

Giannitrapani, K. F., Ahluwalia, S. C., McCaa, M., Pisciotta, M., Dobscha, S., & Lorenz, K. A. (2017). Barriers to using nonpharmacologic approaches and reducing opioid use in primary care. *Pain Medicine, 0*, 1–8.

Gross, A., Forget, M., St. George, K., Fraser, M. M., Graham, N., Perry, L., Burnie, S. J., Goldsmith, C. H., Haines, T., & Brunarski, D. (2012). Patient education for neck pain. *Cochrane Database of Systematic Reviews, 3*, CD005106.

Heymans, M. W., Van Tulder, M. W., Esmail, R., Bombardier, C., & Koes, B. W. (2004). Back schools for non-specific low-back pain. *Cochrane Database of Systematic Reviews, 4*, CD000261.

Institute of Medicine. (2011). Relieving pain in America: A blueprint for transforming prevention, care, education, and research. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK91497/pdf/Bookshelf_NBK91497.pdf.

Kirsh, K. L., & Fishman, S. M. (2011). Multimodal approaches to optimizing outcomes for chronic opioid therapy in the management of chronic pain. *Pain Medicine, S1*, S1–S11.

Kroon, F. B., Van der Burg, L. R., Buchbinder, R., Osborne, R. H., Johnston, R. V., & Pitt, V. (2014). Self -management education programs for osteoarthritis (Review). *Cochrane Database of Systematic Reviews, 1*, CD008963.

Lapane, K. L., Quilliam, B. J., Benson, C., Chow, W., & Kim, M. S. (2014). Impact of noncancer pain on health-related quality of life. *Pain Practice, 15*(4), 333–342.

Mehl-Madrona, L., Mainguy, B., & Plummer, J. (2016). Integration of complementary and alternative medicine therapies into primary-care pain management for opiate reduction in a rural setting. *The Journal of Alternative and Complementary Medicine, 22*(8), 621–626.

Morone, N. E., Rollman, B. L., Moore, C. G., Qin, L., & Weiner, D. K. (2009). A mind-body program for older adults with chronic low back pain: Results of a pilot study. *Pain Medicine, 10*(8), 1395–1407.

National Institute of Health and National Center for Complementary and Integrative Health. (2017). Statistics from the national health interview survey. Retrieved from https://nccih.nih.gov/research/statistics/NHIS.

Nicholson, B., & Passik, S. D. (2007). Management of chronic noncancer pain in the primary care setting. *Southern Medical Journal, 100*(10), 1028–1036.

Park, J., Hirz, C. E., Manotas, K., & Hooyman, N. (2013). Nonpharmacological pain management by ethnically diverse older adults with chronic pain: Barriers and facilitators. *Journal of Gerontological Social Work, 56*, 487–508.

Park, J., & Hughes, A. K. (2012). Nonpharmacological approaches to the management of chronic pain in community -dwelling older adults: A review of empirical evidence. *Journal of American Geriatric Society, 60*(3), 555–568.

Park, J., Lavin, R., & Couturier, B. (2014). Choice of nonpharmacological pain therapies by ethnically diverse older adults. *Pain Management, 4*(6), 389–406.

Parlar, S., Fadiloglu, C., Argon, G., Tokem, Y., & Keser, G. (2013). The effects of self-pain management on the intensity of pain and pain management methods in arthritic patients. *Pain Management Nursing, 14*(3), 133–142.

Parriera, P., Heymans, M. W., Van Tulder, M. W., Esmail, R., Koes, B. W., Poquet, N., Lin, C. C., & Maher, C. G. (2017). Back schools for chronic non-specific low back pain. *Cochrane Database of Systematic Reviews, 8*, CD011674.

Passik, S. D. (2009). Issues in long-term opioid therapy: Unmet needs, risks, and solutions. *Mayo Clinic Proceedings, 84*(7), 593–601.

Shengelia, R., Parker, S. J., Ballin, M., George, T., & Reid, M. C. (2013). Complementary therapies for osteoarthritis: Are they effective? *Pain Management Nursing, 14*(4), e274–e288.

Simmonds, M. J., Finley, E. P., Pugh, M., & Turner, B. J. (2015). A qualitative study of veterans on long-term opioid analgesics: Barriers and facilitators to multimodal pain management. *Pain Medicine, 16*, 726–732.

Staats, P. S., & Wallace, M. S. (2015). *Pain medicine & management: Just the facts* (2nd ed.). New York: McGraw-Hill.

Taylor, S. L., Giannitrapani, K. F., Yuan, A., & Marshall, N. (2017). What patients and providers want to know about complementary and integrative health therapies. *The Journal of Alternative and Complementary Medicine, 24*(1), 85–89.

Whittemore, R., & Knafl, K. (2005). The integrative review: Updated methodology. *Methodological Issues in Nursing Research, 52*, 546–553.