HEALTH EVIDENCE REVIEW COMMISSION (HERC) MULTISECTOR INTERVENTION REPORT

SELF-MANAGEMENT PROGRAMS FOR CHRONIC PAIN

DRAFT as posted for comment 12/13/2023 to 8 a.m. 1/12/2024

QUESTION 1

SHOULD SELF-MANAGEMENT PROGRAMS BE COVERED INTERVENTIONS FOR ADULTS WITH CHRONIC PAIN CONDITIONS?

We are unable to recommend coverage of self-management programs (SMPs) for adults with chronic pain conditions.

Rationale:
We are unable to recommend coverage of SMPs for adults with chronic pain conditions because there was low to very low confidence in the data examining SMPs for these populations. The data that were available did not demonstrate any clear or consistent clinical benefit.

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RATIONALE FOR DEVELOPMENT OF COVERAGE GUIDANCES AND MULTISECTOR INTERVENTION REPORTS

Coverage guidances are developed to inform coverage recommendations for public and private health plans in Oregon as plan administrators seek to improve patient experience of care, population health, and the cost-effectiveness of health care. In the era of public and private sector health system transformation, reaching these goals requires a focus on maximizing the benefits and minimizing the harms and costs of health interventions.

The Health Evidence Review Commission (HERC) uses the following principles in selecting topics for its reports to guide public and private payers:

- Represents a significant burden of disease or health problem
- Represents important uncertainty with regard to effectiveness or harms
- Represents important variation or controversy in implementation or practice
- Represents high costs or significant economic impact
- Topic is of high public interest

HERC bases its reports on a review of the best-available research applicable to the intervention(s) in question. For coverage guidances that focus on diagnostic and clinical interventions, evidence is evaluated using an adaptation of the Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) methodology. For more information on coverage guidance methodology, see Appendix A.

Multisector interventions can be effective ways to prevent, treat, or manage disease at a population level. In some cases, HERC has reviewed evidence and identified effective interventions, but has not made formal coverage recommendations when these policies are implemented in settings other than traditional health care delivery systems, as effectiveness could depend on the environment in which the intervention is implemented.

GRADE

HERC develops recommendations by using the concepts of the GRADE approach. GRADE is a transparent and structured process for developing and presenting evidence and for performing the steps involved in developing recommendations. The tables below list the elements that determine the strength of a recommendation. HERC reviews the evidence and assesses each element, which in turn is used to develop the recommendations presented in the coverage guidance box. Estimates of effect are derived from the evidence presented in this document. Assessments of confidence are from the published systematic reviews and meta-analyses, where available and judged to be reliable. The level of confidence in the estimate is determined by HERC based on the assessment of 2 independent reviewers from the Center for Evidence-based Policy (Center; see Figure 1).

In some cases, no systematic reviews or meta-analyses encompass the most current literature. In those cases, HERC may describe the additional evidence or alter the assessments of confidence in light of all

available information. Such assessments are informed by clinical epidemiologists from the Center. Unless otherwise noted, statements regarding resource allocation, values and preferences, and other considerations are the assessments of HERC, as informed by the evidence reviewed, public testimony, and subcommittee discussion.

FIGURE 1. GRADE TABLE KEY

OUTCOMES	TABLE KEY				
Confidence in Estimate:	NO DATA	VERY LOW	LOW	MODERATE	HIGH
Direction of Effect:	No Data, Unclear, No Effect, Benefit, Harm, Mixed				

Notes. Recommendations for coverage are based on the balance of benefit and harms, resource allocation, values and preferences, and other considerations. See Appendix A for more details about the factors that constitute the GRADE table.
Abbreviation. GRADE: Grading of Recommendations, Assessment, Development, and Evaluations approach.

GRADE TABLE

GRADE TABLE 1

SELF-MANAGEMENT PROGRAMS FOR INDIVIDUALS WITH CHRONIC PAIN

CRITICAL OUTCOMES

Health-related QoL (Overall)

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MIXED

At final study follow-up (range, 12 to 84 weeks) overall QoL findings were mixed, with 9 studies (N = 1,038) observing no difference between study groups and 4 studies (N = 1,187) showing a statistically significant improvement in global QoL after SMP participation compared with controls.

Among the 4 trials reporting a statistically significant beneficial treatment effect, 3 also observed a clinically meaningful difference in overall QoL among study groups.

- Living Healthy trial (N = 230 adults with diabetes and chronic pain)
  - 12-week SMP (individual, telephone, peer-led) vs. education only
  - 52-week change in WOMAC total score: −10.7 vs. +1.8 points ($P < .001$)
  - Lower score indicates QoL improvement; MCID: 10 points
- PPACT trial (N = 850 adults with chronic pain and long-term opioid therapy)
  - 12-week SMP (group, in-person, clinician-led) vs. usual care
  - Participants at 52 weeks with meaningful improvement in RMDQ scores: 12.8% vs. 9.3%; RR, 2.43 (95% CI, 1.67 to 3.51)
  - Lower score indicates improvement; MCID: > 30% score reduction
- Stand Back study (N = 27 adults with desk jobs and chronic low back pain)
  - 24-week SMP (individual, in-person and telephone, clinician-led) vs. usual care
  - Change in ODI scores at 24 weeks: −50% vs. −14% ($P = .04$)
  - Lower scores indicate less pain-related disability; MCID: ≥10 percentage points

One trial reported a statistically, but not clinically meaningful difference, in overall QoL.

- Chen, 2022 (N = 80 young adults with irritable bowel syndrome)
  - 12-week SMP (individual, online, clinician-led) vs. attention control (education only)
  - 12-week change in IBS-QoL scores: +10.5 vs. +4.4 points ($P = .04$)
  - Higher scores indicate improved gastrointestinal QoL; MCID: 10 to 14 points

13 RCTs; N = 2,225

Very low confidence due to RoB (insufficient blinding procedures, substantial study attrition), indirectness (multiple outcome scales, wide variance in intervention design), inconsistency (mixed outcome effects, intervention heterogeneity), and low adherence to assigned interventions in some studies.

Health-related QoL (Pain Intensity)

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MIXED

At final study follow-up (range, 12 to 104 weeks), SMP study groups in 12 trials (N = 1,626) reported no difference in pain intensity scores compared with control groups. Conversely, 2 trials (N = 1,108) observed statistically significant improvement in reported pain levels in SMP groups compared with control groups.

Of the 2 trials that reported a statistically significant treatment benefit for pain intensity, 1 study observed clinically meaningful differences.

- PPACT trial (N = 850 adults with chronic pain and long-term opioid therapy)
  - 12-week SMP (group, in-person, clinician-led) vs. usual care
  - Participants at 52 weeks with meaningful improvement in pain intensity (i.e., ≥ 30% reduction in PEG scores): 25.7% vs. 17.1%; RR, 1.42 (95% CI, 1.11 to 1.81)

One trial reported a statistically, but not clinically meaningful, between-group difference in pain.

- Living Healthy trial (N = 230 adults with diabetes and chronic pain)
  - 12-week SMP (individual, telephone, peer-led) vs. education only
  - 52-week change in McGill Pain Questionnaire scores: −4.0 vs. +0.4 points (*P* = .01)
  - Lower score indicates lower daily pain intensity; MCID: > 5 points

14 RCTs; N = 2,734

Very low confidence due to RoB (insufficient blinding procedures, substantial study attrition), indirectness (multiple outcome scales, wide variance in intervention design), inconsistency (mixed outcome effects), and low adherence to assigned interventions in some studies.

IMPORTANT OUTCOMES

Depression

MIXED

At final study follow-up (range, 12 to 84 weeks), 7 studies (N = 1,137) reported no treatment-related differences in depression, whereas 3 studies (N = 419) observed statistically significantly lower depression scores (indicating fewer depressive symptoms) in SMP groups compared with control groups. In studies with multiple follow-up timepoints, results at the postintervention follow-up generally aligned with end-of-study depression outcomes.

Of the 3 studies that reported statistically significant depression findings, 1 study found significantly fewer depressive symptoms in the SMP group compared with controls at all timepoints.

- Living Healthy trial (N = 230 adults with diabetes and chronic pain)
  - 12-week SMP (individual, telephone, peer-led) vs. education only
  - Mean CES-D-11 scores:
    - 12 weeks: 4.5 vs. 7.1 points (P = .001)
    - 52 weeks: 5.1 vs. 7.1 points (*P* = .03)
  - Lower scores indicate fewer depressive symptoms; no MCID has been established for the CES-D-11

Two studies reported inconsistent SMP-related depression effects.

- Shadick, 2013 (N = 79 adults with rheumatoid arthritis)
  - 36-week SMP (group, in-person, clinician-led) vs. education only
  - Mean BDI scores:
    - 36 weeks: 5.6 vs. 8.1 points; MD, −2.9 points (P = .07)
    - 78 weeks: 6.9 vs. 9.5 points; MD, −3.2 points (*P* = .01)
  - Lower scores indicate fewer depressive symptoms; MCID: 5 points
- Waters, 2016 (N = 110 adults with low back pain and depression)

- 12-week SMP vs. education only vs. usual care
- Change in BDI scores from baseline at 24-week follow-up:
  - SMP vs. education only: −3.9 vs. −2.1 points (P = .07)
  - SMP vs. usual care: −3.9 vs. −1.8 points (*P* < .05)
- Lower scores indicate fewer depressive symptoms; MCID: 5 points

10 RCTs; N = 1,556

Very low confidence due to RoB (insufficient blinding procedures, substantial study attrition), indirectness (multiple outcome scales, wide variance in intervention design), inconsistency (mixed outcome effects), and low adherence to assigned interventions in some studies.

Self-Efficacy

MIXED

At final study follow-up (range, 12 to 104 weeks) self-efficacy results were mixed: 9 studies (N = 953) reported no differences in self-efficacy scores and 4 studies (N = 646) observed significantly improved self-efficacy in SMP groups compared with controls.

Three studies observed statistically significant improvement in self-efficacy as measured by the ASES; it is unclear whether these differences are clinically meaningful as no MCID has yet been defined for this scale. Higher ASES scores indicate improved self-efficacy.

- Living Healthy trial (N = 230 adults with diabetes and chronic pain)
  - 12-week SMP (individual, telephone, peer-led) vs. education only
  - Change from baseline in ASES scores:
    - 12 weeks: +21.5 points vs. +4.6 points; P < .001
    - 52 weeks: +23.7 points vs. +6.8 points; *P* < .001
- STAART (N = 248 African American adults with osteoarthritis)
  - 12-week SMP (individual, telephone, clinician-led) vs. wait-list
  - Mean ASES scores:
    - 12 weeks: 67 points vs. 57 points; *P* < .001
    - 36 weeks: 63 points vs. 57 points; *P* = .002
- RAHelp trial (N = 108 adults with rheumatoid arthritis)
  - 10-week SMP (individual, online, clinician-led) vs. wait-list
  - Mean ASES scores at 46 weeks: 84.1 points vs. 68.6 points; *P* < .001

One 3-arm study observed differing self-efficacy effects, as measured by the CSQ, by comparator group. Lower CSQ scores indicated less impairment in self-efficacy.

- PACe-LBP pilot trial (N = 60 adult veterans with low back pain)
  - 12-week SMP+PA intervention (individual, telephone and in-person, clinician-led) vs. PA only vs. waitlist
  - Change in CSQ scores at 12 weeks:
    - SMP+PA vs. PA only: −10.7 vs. −8.2 points; *P* = .06
    - SMP+PA vs. waitlist: −10.7 vs. −5.8 points; *P* < .001
  - This study was not powered to detect significant changes

GRADE TABLE 1

SELF-MANAGEMENT PROGRAMS FOR INDIVIDUALS WITH CHRONIC PAIN

In the 2 RCTs that assessed measures of patient activation (TakeCharge and ECLIPSE), no between-group differences were observed at final study follow-up.

- TakeCharge and ECLIPSE assessed individuals with multiple sclerosis and musculoskeletal pain, respectively
- Both trial SMPs were structured as individual, telephone-based interventions, but differed in terms of facilitator type

13 RCTs; N = 1,599

Very low confidence due to RoB (insufficient blinding procedures, substantial study attrition), indirectness (multiple outcome scales, wide variance in intervention design), inconsistency (mixed outcome effects, intervention heterogeneity), and low adherence to assigned interventions in some studies.

Medication Use

NO EFFECT

Three studies (N = 1,098) evaluating medication use reported outcomes related to opioid or benzodiazepine medication use by military veterans with musculoskeletal pain (ECLIPSE) or adults with chronic pain and long-term opioid use (PPACT, Sullivan et al., 2017). Few intervention-related differences were observed in any measure of medication use.

- There were no statistically significant between-group differences in terms of: daily opioid dose, change in opioid dose from baseline, number of opioid prescriptions, participants with long-term opioid use or high daily dose, or in scores indicating opioid-related concerns (e.g., abuse or misuse risk)
- There were inconsistent effects across study timepoints for: opioid related psychosocial problems and rates of benzodiazepine use

3 RCTs; N = 1,098

Low confidence due to RoB concerns (insufficient blinding procedures, substantial study attrition), indirectness (multiple outcomes and scales, wide variance in interevention design), and imprecision (small sample size in 1 RCT).

Health Resource Use

NO EFFECT

In 1 single-center RCT (the ECLIPSE trial) that compared a 24-week SMP (individual, in-person, peer-led) with a low-intensity, education-only attention control activity in veterans with chronic musculoskeletal pain, there were no significant between-group differences at follow-up in the number of:

- Phone or secure message communications
- Outpatient visits
- ED visits
- Hospitalizations
- Days hospitalized

Study results did not differ when analyses were limited to participants with high adherence to study procedures.

1 RCT; N = 215

Very low confidence due to RoB (insufficient blinding procedures, substantial study attrition), indirectness (population restricted to patients with musculoskeletal pain), and low adherence to assigned interventions.

Balance of benefits and harms

Among adults with chronic pain conditions who participate in SMPs, there is very little evidence of benefit, and few clinically meaningful differences in clinical outcomes. While few or no harms were reported, there is low or very low confidence in the findings evaluating the benefits of SMP for adults with chronic pain conditions.

Resource allocation

In the absence of clear benefit, the overall value of SMPs remains unclear for adults with chronic pain conditions.

Values and preferences

Some adults with chronic pain conditions may prefer SMPs to help manage their condition or symptoms despite the overall lack of clinical benefit. Other adults would not value programs that do not provide a clear clinical benefit.

Other considerations

There is an overall absence of clear evidence for benefit for SMP in adult populations with chronic pain conditions and very low confidence in benefits related to health-related or condition-specific QoL, depression, self-efficacy, or health resource use.

Notes. GRADE table elements are described in Appendix A; a corresponding GRADE Evidence Profile is in Appendix B.
Abbreviations. ASES: Arthritis Self-Efficacy Scale; BDI: Beck Depression Index; CES-D-11: Center for Epidemiologic Studies Depression Scale, 11-item version: CI: confidence interval; CSQ: Coping Skills Questionnaire; ED: emergency department; GRADE: Grading of Recommendations, Assessment, Development, and Evaluations approach; IBS: irritable bowel syndrome; MCID: minimal clinically important difference; MD: mean difference; ODI: Owestry Disability Index; PA: physical activity; PEG: Pain, Enjoyment of Life, and General Activity Scale; QoL: quality of life; RCT: randomized controlled trial; RMDQ: Roland Morris Disability Questionnaire; RoB: risk of bias; RR: relative risk; SMP: self-management program; vs.: versus; WOMAC: Western Ontario and McMaster Universities Arthritis Index.

BACKGROUND

This section includes contextual information regarding chronic pain and self-management programs (SMPs), including the prevalence and impact of chronic pain, aspects of SMP design, barriers to SMP participation, summary information on the potential cost-effectiveness of SMP participation, and the impact of SMPs on caregivers.

The CDC estimates that over 20% of US adults (51.6 million people) are living with chronic pain.[1] Chronic pain, defined as pain lasting longer than 3 months, is one of the most common reasons adults seek medical care, and is associated with decreased quality of life (QoL), opioid dependence, and poor mental health.[1] Prevalence of chronic pain increases with age, is more common in women than men, and is most common among non-Hispanic White adults.[1] Although prevalence data are not readily available for chronic pain in Oregon, the Centers for Disease Control and Prevention (CDC) estimated average national prevalence rate (20.9%)[1] could equate to approximately 886,000 (of 4.2 million total)[2] Oregonians living with chronic pain.

Chronic pain can be disabling, resulting in high ongoing treatment costs and lost productivity from missed work or school.[3,4] The CDC estimates that chronic pain costs the US $560 billion to $635 billion annually in direct and indirect costs, which exceeds the annual costs associated with other common chronic conditions (e.g., cardiovascular disease, metabolic disorders).[3,5] According to an Institute of Medicine report, most Americans living with chronic pain receive inadequate pain care and the treatment strategies they do receive are based primarily on pharmacologic interventions, such as opioid therapy, which is associated with adverse consequences such as dependence or overdose.[4] Citing high costs and the risks of pharmacotherapy for treatment of chronic pain, the National Pain Strategy, which was released in 2016 by the Interagency Pain Research Coordinating Committee, called for a coordinated assessment of behavioral interventions, such as SMPs, in the interest of improving QoL and reducing costs for individuals with chronic pain.[4]

Chronic Disease Self-Management Programs

The Chronic Disease Self-Management Program (CDSMP) is an evidence-based intervention that was originally developed in the early 1990s by Stanford University's Patient Education Resource Center to help people manage their chronic conditions.[6] Although the Stanford CDSMP is now licensed through the Self-Management Resource Center, other entities have created similar chronic disease self-management education programs.[7] For the purposes of this report, SMPs will refer to any social learning theory–based chronic disease self-management education program, including but not limited to, the Stanford CDSMP. These SMPs are typically held in community settings such as recreation centers, libraries, health centers and senior centers, with the goal of promoting mutual peer support and encouraging participants to adopt behaviors that improve their QoL by actively managing their own chronic disease(s).[7] These SMP sessions address topics that are common to managing a wide variety of chronic conditions, including healthy eating, relaxation techniques, sleep, communication, medication management, understanding emotions, weight management, problem-solving skills, working with health professionals, and creating and modifying a personal action plan.[7] These SMPs can be offered in group or individual formats and as synchronous (e.g., in-person, telephone) or asynchronous modalities (e.g., online modules, direct

messaging).[7] SMPs are usually facilitated by trained lay persons, but SMP-trained health care professionals may also facilitate the sessions.[7]

These programs focus on improving participants' self-management of chronic illness, with the ultimate goal of affecting a variety of health-related outcomes, including improvements in self-efficacy, health behavior (e.g., exercise frequency, symptom management, communication with health care providers), health status (e.g., level of self-reported health, health distress, disability, fatigue, QoL), and health care service use.[8] SMP outcomes are typically measured and evaluated using the participants' self-reports for clinical outcomes, including self-report of health care service use and health status.[8] The original Stanford CDSMP studies developed and validated instruments and scales for assessing relevant patient-reported outcomes, such as the Arthritis Self-Efficacy Scale (ASES); additional measures have been developed and validated as these programs have proliferated and evolved.[8]

Access and Equity

The overall prevalence rate of chronic diseases in Oregon is 52.1%.[9] Prevalence is higher among adults on the Oregon Health Plan (OHP), 64% of whom are living with at least 1 chronic condition (including chronic pain).[9] Unemployment, lower income levels and older age are also associated with having at least 1 chronic condition.[9] These findings are consistent with a CDC report[3] that highlighted important disparities in the prevalence of chronic pain among certain population groups. Nationally, the prevalence of chronic pain is higher among older adults, females, adults currently unemployed (but who worked previously), veterans, adults living in poverty, those residing in rural areas, and those with public health insurance.[3] Black, Indigenous, Hispanic, Asian, and other people of color and people with lower incomes make up a relatively high proportion of OHP members and those who are involved with programs that serve OHP members.[9]

Multiple factors have been identified as barriers to SMP enrollment and participation; consideration of these factors, among others, is needed to facilitate patients' ability to participate in SMPs. These barriers may include[10]:

- Competing commitments (employment, travel plans, medical appointments, household responsibilities, caregiving)
- Logistical barriers (challenges with transportation to the program, program cost, limited flexibility in SMP scheduling)
- Personal characteristics (race, ethnicity, cultural barriers)
- Other personal characteristics (e.g., gender, race, socioeconomic status, education) are associated with mixed findings of both higher and lower rates of SMP participation, demonstrating how factors that influence enrollment and attendance are multifactorial and complex
- Barriers related to perception of illness (viewing condition as fatal, having mild symptoms, poor physical or mental health status, cognitive impairment, valuing the ability to cope with the disease independently)
- Health service provision barriers (perceiving current health care to be adequate, dissatisfaction with care due to lack of access to medical care, uncollaborative health care providers

SMP programs carefully designed to reflect the needs of the individuals and communities they serve may help to mitigate some of these barriers.[10] Offering Spanish-language programs in Spanish-speaking

communities, for example, has been shown to increase SMP enrollment and completion rates.[11] Similarly, virtual web-based SMPs allow participants to attend programs from home, which can mitigate barriers related to travel (including commute time and cost) and may also make it easier for individuals to balance the program with work commitments.[12-14]

Cost-Effectiveness of SMPs (Contextual Question 1)

Systematic reviews of economic studies have described mixed effects regarding the cost-effectiveness of SMPs for chronic pain populations, which review authors have largely attributed to a lack of consistent metrics and techniques used to assess cost-effectiveness.[15-17] Moreover, these reviews include economic evidence from countries that have payment and funding structures for health care that may not be generalizable to US contexts. In contrast, economic evaluations embedded in US-based clinical trials suggest that non-Stanford model SMPs may offer cost and cost-effectiveness benefits to patients with chronic pain and their care teams.[18,19]

- In a cluster randomized trial of adults with mixed chronic pain conditions on long-term opioid therapy (N = 850) who received treatement in primary care clinics in 3 US regions (Northeast, Southeast, and Hawaii), estimated program costs for participants who were randomized to a 12-week SMP (group-based, in-person, clinican-led) were offset by lower medical costs and resulted in $1,841 lower per-patient follow-up medical care costs over the 1-year follow-up period than the participants randomized to usual care.[18] These findings were driven by lower overall 6-month health care service use in the intervention group, particularly in hospital stays and pharmacy, compared with controls.[18]
- A smaller pilot trial of a 12-week SMP (group-based, in-person, peer-led) for chronic pain in people living with HIV in Alabama (N = 44) conducted utility analyses showing that participants in the intervention group were more likely to place a higher value on their lives and indicated that they were less likely to accept higher-risk therapies for pain (e.g., opioids) after completing an SMP program, compared with the usual-care control group.[19]

Notably, the SMP interventions in both of these studies were delivered in-person over a 12-week period in a group-based format, but differed in terms of facilitator type.[18,19]

Impact of SMPs on Caregivers (Contextual Question 2)

Chronic pain conditions impact both those living with these conditions and their caregivers. For individuals experiencing functional limitations due to chronic pain, caregiver support is important. Individuals with chronic pain are likely to have functional comorbidities such as depression, anxiety, sleep disturbances, and physical disability that disrupt activities of daily living.[20] However, caregivers who provide ongoing daily support for patients with chronic conditions may also face substantial physical and mental burdens, increasing the risk for physical impairment or mental health morbidity over time.[21,22]

Certain patient characteristics may increase the perceived burden of caregiving relative to others. A recent cross-sectional study assessing caregiving burden among caregivers of adult patients with chronic noncancer pain found that caregivers were more likely to report higher perceived caregiving burden when their patients reported higher levels of pain and depression and lower levels of self-efficacy.[23] Among these patient outcomes, self-efficacy was the most negatively correlated with caregiver burden.[23]

While larger longitudinal studies would be needed to explore the nature of this relationship over time, these results suggest that treatments focused on improving patient self-efficacy, such as SMPs, may subsequently reduce caregiver burden.[23]

In addition to the potential indirect caregiving benefits associated with patient-focused self-efficacy interventions, caregiver enrollment in SMPs may offer a more direct method for improving caregiver burden.[24,25] To that end, caregiver-directed SMP interventions have been shown to significantly increase caregiver self-efficacy in terms of managing their stress as well improving confidence in addressing their patients' needs.[26] Accordingly, studies have observed high completion rates among caregivers who participate in self-efficacy–building programs, such as SMPs. An analysis of more than 2,000 adult participants enrolled in CDSMP workshops open to both caregivers and non-caregivers in New York State found that caregiver participants were significantly more likely than non-caregivers to complete the entire workshop.[25] These differences persisted even after controlling for workshop variation including class size, languages offered, facilitator experience, and location.[25]

METHODS

The following section summarizes the overall scope and methods used to produce this evidence review, including Key Questions (KQs) and Contextual Questions (CQs), inclusion and exclusion criteria, and a brief overview of the methods used. Additional information regarding report methods can be found in Appendix C.

Key Questions

KQ1. What is the effectiveness of SMPs compared to usual care?

KQ2. How does the effectiveness of SMPs vary by:

- a. Intervention characteristics
- b. Patient characteristics
  - i. Place of residence
  - ii. Race, ethnicity, culture, or language
  - iii. Occupation
  - iv. Gender or sex
  - v. Age
  - vi. Religion
  - vii. Education
  - viii. Socioeconomic status
  - ix. Social capital

Contextual Questions

These questions are addressed in the Background section.

CQ1. What is the cost-effectiveness of SMPs?

CQ2. What is the impact of SMPs on caregiver support?

Study Eligibility Criteria

Table 1 summarizes the criteria used to inform study selection for the evidence review. See Appendix C for more detailed selection criteria.

TABLE 1. EVIDENCE REVIEW CRITERIA OVERVIEW FOR STUDIES OF SMPs FOR CHRONIC PAIN

CATEGORY	INCLUDED	EXCLUDED
POPULATION	Adults with chronic pain,[a] including those with arthritis	Children and youth; adults with conditions not associated with chronic pain
INTERVENTIONS	SMPs (synchronous or asynchronous) that: ■ Target behavior modification through iterative feedback[b] between participants and trained facilitators[c] ■ Address multiple components of self-management (e.g., goal setting, communication with providers) ■ Use standardized curricula ■ Are delivered by trained clinical or peer facilitators	Self-management interventions without direct engagement between participants and facilitators; single-component self-management interventions (e.g., patient education or cognitive behavioral therapy only)
COMPARATORS	Usual care, education only, wait-list, active controls for multicomponent interventions (e.g., SMP + physical activity vs. physical activity alone)	Active controls when the SMP is not part of a multicomponent intervention (e.g., weight loss programs, physical activity interventions)
OUTCOMES	**Critical:** health-related quality of life **Important:** depression, self-efficacy, change in medication use, health resource use	**Considered but not selected:** increased physical activity, patient activation, cost or cost-effectiveness
SETTINGS	Outpatient programs; community settings (including adults living in institutional settings[d])	Inpatient settings
STUDY DESIGNS	RCTs conducted in the US	Nonrandomized studies; non-US-based RCTs
FOLLOW-UP	12 weeks or greater	Less than 12 weeks

Notes. [a] As defined by study investigators. [b] Defined as 2 or more points of contact where skill-building occurs. [c] Facilitators may be clinicians, community workers, or peers who have been formally trained to administer the SMP. [d] Institutional settings may include nursing homes and assisted living, group homes, and correctional facilities.
Abbreviations. RCT: randomized controlled trial; SMP: chronic disease self-management program.

Methods Overview

To answer the KQs, we searched multiple clinical evidence databases (e.g., Ovid MEDLINE, Cochrane CENTRAL) for published randomized controlled trials (RCTs) evaluating the effectiveness and harms of SMPs for adults with chronic pain conditions. We only considered English-language studies with at least 12-weeks of follow-up, published in 2011 or later. Owing to an unexpected volume of eligible literature identified during screening, and because of a desire to maximize the review's applicability to US settings, study inclusion was further limited to RCTs conducted in the US. As there is no currently established consensus regarding the structure or content of SMPs, we created a set of program screening criteria based on audits of other systematic reviews of SMPs (see Appendix C). Under these criteria, eligible SMPs

were primarily educational in nature, included iterative feedback between participants and trained facilitators, relied on structured content delivery (e.g., modules, manuals), and addressed 2 or more of the following elements: goal-setting, problem-solving, coping skills, provider communication, and therapeutic adherence. Studies of multicomponent interventions were included only if reviewers were able to isolate the impact of the SMP against an eligible comparator (i.e., usual care, wait-list, education only).

Two reviewers independently examined abstracts and full-text articles for inclusion and assessed the risk of bias of included studies. Disagreements were resolved through consensus or by a third reviewer. We assessed the overall strength of evidence by outcome using the previously described GRADE framework.

We identified evidence for CQs by using results of the KQ database searches, auditing reference lists of relevant systematic reviews, and performing targeted searches of relevant sources as needed. We included any study design or other type of publication if it was relevant to answering the CQ and was published in English. Evidence addressing the CQs is summarized in the Background section under Cost-Effectiveness (CQ1) and Caregiver Impacts (CQ2).

For the Policy Landscape section, we conducted targeted searches in Ovid MEDLINE, websites of relevant professional societies and guideline groups, and DuckDuckGo to identify relevant clinical practice guidelines published since 2018 and key payer policies regarding SMPs for individuals with chronic pain. Two reviewers independently assessed the methodologic quality of the included clinical practice guidelines using a modified version of the AGREE tool[27]; disagreements were resolved through consensus or by a third reviewer.

EVIDENCE REVIEW

The following results section organizes findings by outcomes: health-related QoL (overall and pain-related), depression, self-efficacy, changes in pain medication use, and health resource use. Results in this section are described at a high level with additional detailed information tables on study design and outcomes reported in Appendix D.

Included Study Overview

We identified 18 eligible RCTs (reported in 33 publications)[18,19,28-58] that evaluated the effectiveness of SMPs in individuals with chronic pain conditions (Table 2). Four studies assessed SMPs in individuals with mixed (i.e., all-cause) chronic pain conditions[29,30,35,45]; 3 studies each limited inclusion to adults with osteoarthritis,[41,42,44] low back pain (LBP),[34,36,43] and rheumatoid arthritis (RA)[38-40]; and 1 study each evaluated populations with pain related to diabetes,[32] HIV,[33] irritable bowel syndrome (IBS),[28] multiple sclerosis,[37] and musculoskeletal injuries.[31]

Study designs and sample sizes ranged from a pilot RCT enrolling 27 individuals to a large-scale cluster RCT that enrolled 850 individuals. We assessed 4 studies as having a low risk of bias (RoB),[30,37,42,44] 10 as moderate RoB,[28,31,32,34,35,38-41,43] and 4 as high RoB[29,33,36,45]; moderate and high RoB ratings were due primarily to inadequate blinding procedures and high study attrition. Twelve studies compared SMPs with usual care or wait-list controls[29,30,33-36,39-43,45] and 9 studies had attention-control comparators,[28,31,32,36-38,41,43,44] which typically included brief training in disease education or physical

activity alone (note: 3 studies[36,41,43] had more than 1 comparator group). Study follow-up ranged from 12 to 104 weeks, and 7 studies followed participants for at least 52 weeks (mean duration of follow up, 42 weeks). See Appendix D, Table D1 for additional study design characteristics.

For most studies, mean participant age was 50 years or greater and most participants were female (mean % female, 67%), which aligns with the distribution of chronic pain in the general population. Although not consistently reported, participants had baseline pain durations or diagnoses ranging from 3 years to 20 years or more, and use of prescription pain medications (particularly opioids and benzodiazepines) was common. Several included studies limited enrollment to populations known to experience a disproportionate burden of chronic pain, including older adults,[29,43,44] people with depression,[36,37] veterans,[31] Black or African American individuals,[40,42] and people with low-income.[40,45] See Appendix D, Table D1 for additional participant characteristics.

There was substantial heterogeneity in the format, content, duration, and approach of SMPs assessed in the RCTs identified for inclusion (Table 2; Appendix D, Table D2).

- 16 studies evaluated primarily synchronous SMPs: 8 were individual programs conducted largely over the telephone,[31,32,34-37,42,43] 6 were group-based interventions conducted in-person or online via videoconferencing,[29,30,38,40,41,44,45] and 1 study program included an equal number of group and individual sessions.[33] Notably, only 1 eligible study assessed a Stanford-developed CDSMP (the Arthritis Self-Management Program).[40] Although the other synchronous SMPs were broadly informed by social learning theory and included content or structural elements similar to the CDSMP, few were administered by peer facilitators and the content was generally tailored to the unique needs of their study populations (Appendix D, Table D2). Across the synchronous SMPs, participants were frequently provided with supplementary materials, such as manuals or online modules, to reinforce self-management concepts.
- In the 2 studies that assessed primarily asynchronous SMPs,[28,39] participants principally received self-management training through online educational modules and discussion forums, secondarily reinforced by intermittent telephone consultations with trained facilitators.[28,39]
- The duration of self-management interventions varied widely (range, 6 to 50 weeks) with participants experiencing up to 3 points of contact each week. However, most programs were delivered over 9 to 12 weeks and included 1 session of 60 minutes or more per week.
- 15 studies[28-30,34-45] engaged licensed clinicians to facilitate the self-management interventions, including clinical psychologists and therapists, nurses, physician assistants, physical therapists, pharmacists, dieticians, and social workers; 2 programs[31,32] were administered by trained peer facilitators, and 1 program[33] was jointly administered by clinicians and peers.
- Although there was substantial variation in program content, most SMPs addressed pain education, relaxation techniques, goal-setting, treatment adherence, and emotional regulation through cognitive behavioral therapy (CBT). See Appendix D, Table D2 for additional details regarding the content and structure of the included SMPs.

TABLE 2. OVERVIEW OF INCLUDED STUDIES OF SMPs FOR PAIN MANAGEMENT

STUDY CHARACTERISTICS				SMP CHARACTERISTICS			OUTCOMES AT FINAL STUDY FOLLOW-UP					
							CLINICAL AND STATISTICAL SIGNIFICANCE			STATISTICAL SIGNIFICANCE ONLY		
							NO DIFFERENCE			NOT REPORTED		
RISK OF BIAS	N	TOTAL FOLLOW-UP (wks)	CP CAUSE	FORMAT	MODALITY	FACILITATOR TYPE	HRQoL: OVERALL	HRQoL: PAIN	DEPRESSION	SELF-EFFICACY	MEDICATION USE	HEALTH RESOURCE USE
Allen, 2019 (STAART)[42]												
Low	248	36	OA	Individual	Phone	Clinicians	No difference	No difference	No difference	Favors SMP[a]		
Andreae, 2020 (Living Healthy)[32]												
Moderate	230	52	DM	Individual	Phone	Peers	Favors SMP	Favors SMP	Favors SMP	Favors SMP[a]		
Barone Gibbs, 2018 (Stand Back)[34]												
Moderate	27	24	LBP	Individual	Phone	Clinicians	Favors SMP					
Chen, 2022[28]												
Moderate	80	12	IBS	Individual	Online	Clinicians	Favors SMP	No difference	No difference	No difference		
Conn, 2013 (ASMP)[40]												
Moderate	104	72	RA	Group	In-person	Clinicians	No difference	No difference				
DeBar, 2022 (PPACT)[30]												
Low	850	52	Any	Group	In-person	Clinicians	Favors SMP	Favors SMP			No difference	
Ehde, 2015 (TakeCharge)[37]												
Low	163	52	MS	Individual	Phone	Clinicians	No difference	No difference	No difference	No difference		
Fanning, 2022 (MORPH)[29]												
High	28	12	Any	Group	In-person	Clinicians	No difference	No difference		No difference		
Focht, 2014 (IMPACT-P)[44]												
Low	80	52	OA	Group	In-person	Clinicians				No difference		
Goode, 2018 (PACe-LBP)[43]												
Moderate	60	12	LBP	Individual	Phone In-person	Clinicians	No difference			Favors SMP[a]		
Matthias, 2020 (ECLIPSE)[31]												
Moderate	213	36	MSK	Individual	Phone In-person	Peers	No difference	No difference	No difference	No difference	No difference	No difference
Merlin, 2018 (STOMP)[33]												
High	43	16	HIV	Group Individual	In-person	Clinicians Peers		No difference		No difference		

STUDY CHARACTERISTICS				SMP CHARACTERISTICS			OUTCOMES AT FINAL STUDY FOLLOW-UP					
							CLINICAL AND STATISTICAL SIGNIFICANCE		STATISTICAL SIGNIFICANCE ONLY			
							NO DIFFERENCE		NOT REPORTED			
RISK OF BIAS	N	TOTAL FOLLOW-UP (wks)	CP CAUSE	FORMAT	MODALITY	FACILITATOR TYPE	HRQoL: OVERALL	HRQoL: PAIN	DEPRESSION	SELF-EFFICACY	MEDICATION USE	HEALTH RESOURCE USE
Shadick, 2013[38]												
Moderate	79	84	RA	Group	In-person	Clinicians	No difference		Favors SMP	No difference		
Shigaki, 2013 (RAHelp)[39]												
Moderate	108	36	RA	Individual	Online	Clinicians	No difference	No difference	No difference	Favors SMP[a]		
Somers, 2013 (OA Life)[41]												
Moderate	232	104	OA	Group	In-person	Clinicians		No difference		No difference		
Sullivan, 2017[35]												
Moderate	35	34	Any	Individual	Phone In-person	Clinicians	No difference	No difference	No difference	No difference	No difference	
Thorn, 2018 (LAMP)[45]												
High	290	24	Any	Group	In-person	Clinicians	No [illegible]orted	No difference	No difference			
Waters, 2016[36]												
High	110	24	LBP	Individual	Phone In-person	Clinicians	[illegible]repor[illegible]	No difference	Favors SMP			

Note. [a] Difference may also be clinically significant, but no documented threshold was available for the relevant measurement scale.
Abbreviations. Any: any chronic pain type; CP: chronic pain; DM: diabetes mellitus; HIV: human immunodeficiency virus; HRQoL: health-related quality of life; IBS: irritable bowel syndrome; LBP: low back pain; MS: multiple sclerosis; MSK: musculoskeletal pain; OA: osteoarthritis; RA: rheumatoid arthritis; SMP: self-management program; wks: weeks.

Health-related Quality of Life

For this report, we evaluated health-related quality of life outcomes associated with overall QoL and pain severity, which used a range of validated measurement scales based on patient self-report. For detailed information on each measurement scale, including scale ranges and interpretation instructions, see Appendix D, Table D3.

Overall Quality of Life

Thirteen RCTs (N = 2,225)[28-32,34,35,37-40,42,43] reported overall QoL using a range of validated scales with varying definitions, including general well-being (e.g., SF-36), overall disability (e.g., Owestry Disability Index [ODI]), and composite measures of change across multiple indices (Table 2; Appendix D, Table D4).

At final study follow-up (range, 12 to 84 weeks) overall QoL findings were mixed, with 9 studies (N = 1,038) observing no difference among study groups,[29,31,35,37-40,42,43] and 4 studies (N = 1,187) showing a statistically significant improvement in global QoL after SMP participation compared with controls (Table 2).[28,30,32,34] In studies that reported outcomes at multiple follow-up timepoints, [30-32,35,37-40,42] similar treatment effects were observed at the first postintervention timepoint and at final follow-up (Appendix D, Table D4).

Among the 4 trials that reported a statistically significant beneficial treatment effect compared with controls, 3 studies observed a clinically meaningful difference in overall QoL between study groups.[30,32]

- The Living Healthy cluster RCT (N = 230)[32] enrolled adults with diabetes and chronic pain from 50 participating communities in rural Alabama and randomized participants to a 12-week SMP (individual format, telephone-administered, peer-led, CBT-informed) or attention control (general health advice). At the final 52-week follow-up, participants in the SMP group reported a mean reduction of 10.7 points in overall score on the Western Ontario and McMaster Universities Osteoarthritis Index scale (range: 0 to 100; lower score indicates improvement) compared with a mean increase of 1.8 points in the group ($P < .001$).[32,52] These results exceeded the established clinically meaningful threshold of 10 points[59] for both within-group change in the SMP group and for between-group effects.[32,52] We assessed this study as having a moderate RoB due to differential attrition between study groups.
- The Pain Program for Active Coping and Training (PPACT) cluster RCT (N = 850)[30] enrolled adults with chronic pain and a history of long-term opioid treatment from 106 participating primary care clinics in Georgia, Hawaii, and the Pacific Northwest, and randomized participants to a 12-week SMP (group format, in-person, clinician-led, CBT-informed) or usual care. At the final 52-week follow-up, a significantly greater proportion of participants who were randomized to the SMP group experienced a clinically meaningful score reduction of 30 percent or greater from baseline on the Roland Morris Disability Questionnaire (lower score indicates improvement) compared with the control group (12.8% vs. 9.3%; relative risk [RR], 2.43; 95% confidence interval [CI], 1.67 to 3.51).[30,60] We assessed this study as having a low RoB.
- The Stand Back pilot study enrolled adult desk workers with chronic LBP from community and university settings in Pittsburgh, Pennsylvania (N = 27) and randomized participants to a 24-week multicomponent intervention including a bimonthly SMP (individual format, in-person and telephone administered, clinician-led, CBT-informed) in addition to a standing desk attachment

and an activity-prompting device, or to a usual care control group. At the final 24-week follow-up, the relative decrease from baseline in LBP disability, as measured by the ODI, was 50% in the SMP group compared with 14% in the control group (P = .04); estimates were adjusted for average reported daily sitting hours at baseline. Additionally, the relative change in ODI scores between groups exceeded the 10-percentage-point threshold for clinical significance; however, the difference in mean ODI scores between groups was not clinically significant (12.3 vs. 20.1 points). This study was rated as having a moderate RoB due to unblinded randomization procedures and imbalances in key baseline characteristics.

The remaining trial demonstrated statistically significant, but not clinically meaningful, change in overall QoL.

- In an RCT conducted by Chen and colleagues, young adults with IBS recruited from 2 hospital-based gastrointestinal clinics and 2 campus clinics at a public university in Connecticut (N = 80) were randomized to a 12-week SMP intervention (individual format, online-administered, clinician-led) or attention control (online education–only modules).[28] At the final 12-week follow-up, SMP participants reported significantly greater improvement in IBS-related QoL compared with the control group, as measured by mean overall score change on the IBS-QoL scale (+10.5 vs. +4.4 points; P = .04).[28] Although the intervention group experienced a relative change from baseline that met the 10- to 14-point threshold for clinical significance established in prior research,[61] the difference between groups was not clinically meaningful. This study was assessed as having a moderate RoB due to substantial loss to follow-up and uncertainty whether the reported results were based on an intention-to-treat analysis.

No relevant subgroup analyses were reported across these 13 RCTs.

Pain Intensity

Fourteen RCTs (N = 2,734)[28-33,35-37,39-42,45] assessed changes in pain intensity across a range of QoL scales and definitions, including global amount of bodily pain (e.g., SF-36), intensity and quality of pain (e.g., Brief Pain Inventory), amount of pain-related disability (e.g., Pain, Enjoyment of Life and General Activity [PEG] scale), and pain in disease-specific sites (e.g., joint pain related to RA). For detailed information on each measurement scale, including scale ranges and interpretation instructions, see Appendix D, Table D3.

At final study follow-up (range, 12 to 104 weeks), SMP study groups in 12 trials (N = 1,626)[28,29,31,33,35-37,39-42,45] reported similar pain intensity scores as control groups, and SMP groups in 2 trials (N = 1,108)[30,32] reported significantly lower pain intensity compared with control groups (Table 2). In studies that reported pain intensity at multiple timepoints, similar treatment effects were observed at the first and subsequent postintervention timepoints (Appendix D, Table D4).

Of the 2 trials that reported a statistically significant treatment benefit for pain, 1 study observed clinically meaningful differences.

- In the PPACT cluster RCT (N = 850),[30] adults with chronic pain and a history of long-term opioid therapy who were randomized to the SMP intervention reported significantly lower pain intensity, as measured by changes in PEG scores (range: 0 to 30; lower score indicates improvement) at 52 weeks compared with those randomized to usual care (−0.94 vs. −0.51 points; MD, −0.43 points;

95% CI, −0.70 to −0.17). In addition, a statistically greater proportion of participants in the SMP group experienced a clinically meaningful reduction in pain severity (i.e., ≥ 30% reduction in PEG scores) compared with controls (25.7% vs. 17.1%; RR, 1.42; 95% CI, 1.11 to 1.81).[30] This trial was rated as having a low RoB.

One trial reported a statistically but not clinically meaningful difference in pain severity for the intervention group compared with controls.

- In the Living Healthy cluster RCT of adults with diabetes and chronic pain (N = 230)[32] there were no differences in changes in pain severity scores from baseline at the 12-week post-intervention follow-up among participants randomized to an SMP (individual format, telephone-administered, peer-led, CBT-informed) versus an education-only control intervention (−4.4 vs, −2.2 points; *P* = .07). However, at the final 52-week follow-up, the relative reduction in pain scores from baseline was significantly greater in the SMP group compared with controls (−4.0 vs, +0.4 points; *P* = .01).[32] Pain intensity was measured by the McGill Pain Questionnaire (range: 0 to 45 points; lower scores indicate lower daily pain intensity) that was adjusted for baseline age, sex, body mass index, smoking status, high-fat food intake, pain coping score, and depressive symptoms.[32] While statistically significant, the between-group difference observed at the end of follow-up did not meet the clinically significant threshold of a greater than 5-point change, as established in prior research.[32,62] We assessed this study as having a moderate RoB due to differential attrition between study groups.

Additional comparisons and relevant subgroup analyses were reported in 2 trials (Appendix D, Table D4).

- A 2013 RCT conducted by Conn and colleagues evaluated the Stanford-developed Arthritis Self-Management Program (N = 104)[40] in low-income African American adults with RA who were randomized to a 6-week SMP group (group format, in-person, clinician-led) compared with usual care. The experience of pain severity at 72 weeks of follow-up was measured by the number of tender and swollen joints.[40] Pain intensity scores were found to be significantly greater among younger-aged participants at enrollment (i.e., 60 years or younger) in a multivariable analysis, with younger participants reporting a higher pain burden (*P* = .008).[40] In contrast, there were no differences in pain intensity scores by employment, insurance status, duration of RA, or medication adherence.[40]
- In a 2016 RCT (N = 110),[36] Waters and colleagues compared a 12-week SMP intervention (individual format, in-person, clinician-led) for adults with LBP and major depressive disorder compared with an attention control group (education on LBP and related exercises) and a usual care group. At the final 24-week follow-up there were no statistically significant differences in pain intensity, as measured by the Numeric Pain Rating Scale, compared with either control group.[36]

Depression

Ten RCTs reported depression-related outcomes (Table 2; N = 1,266).[28,31,32,35-39,42,45] As with other patient-reported outcomes, studies used a range of validated scales to evaluate depression: 5 studies[31,35,37,42,45] used a version of the Patient Health Questionnaire in adults with mixed chronic pain,

multiple sclerosis, musculoskeletal pain, and osteoarthritis; 2 studies[36,38] used the Beck Depression Inventory (BDI) in LBP and RA populations; 2 studies[32,39] used the an 11-item short-form version of the Center for Epidemiologic Studies Depression scale (CES-D-11) in diabetes and RA populations; and 1 study[28] used the PROMIS (Patient-Reported Outcomes Measurement Information System) depression scale in adults with IBS. Across the reported assessment scales, lower scores indicated fewer depressive symptoms. For detailed information on each measurement scale, including scale ranges and interpretation instructions, see Appendix D, Table D3.

At final study follow-up (range, 12 to 84 weeks), results were mixed (Table 2): 7 studies (N = 1,137)[28,31,35,37,39,42,45] reported no treatment-related differences in depression, whereas 3 studies (N = 419)[32,36,38] observed significantly lower depression scores in SMP groups compared with control groups. Among studies with multiple follow-up timepoints, results at the postintervention follow-up generally aligned with end-of-study depression outcomes (Appendix D, Table D5).

Of the 3 studies that reported statistically significant depression findings, 1 study found significantly fewer depressive symptoms in the SMP group compared with controls at all timepoints.

- In the Living Healthy cluster RCT of adults with diabetes and chronic pain (N = 230), participants in the SMP group had significantly lower CES-D-11 scores (range: 0 to 10 points, lower scores indicate fewer depressive symptoms) compared with education-only controls (4.5 vs. 7.1 points; *P* = .001) at the 12-week postintervention timepoint.[32] At the final 52-week follow-up, participants in the SMP group reported a slight increase in depressive symptoms, but the difference between groups was still statistically significant (5.1 vs. 7.1 points; *P* = .03).[32] It is unclear, however, whether these differences are clinically meaningful as no established standard yet exists for the short-form version of the CES-D used in this study.[32]

Two of the RCTs that observed significant between-group differences in depression at the end of follow-up, as measured by the BDI, reported inconsistent results (Appendix D, Table D5).[36,38]

- In a pilot RCT conducted by Shadick and colleagues (N = 79) that compared a 36-week SMP (group format, in-person, clinician-led) with an education-only attention control activity in adults with RA, there were no between-group differences in BDI scores immediately postintervention (i.e., 36 weeks), but scores in the SMP group were significantly lower at the final 78-week follow-up compared with controls (MD, −3.2 points; 95% CI, −5.6 to −0.8; *P* = .01).[38] This study was assessed as having a moderate RoB due to differential attrition rates between study groups and insufficient information about potential conflicts of interest from study investigators or funders.
- In the 3-arm RCT conducted by Waters and colleagues (N = 110) that compared a 12-week SMP intervention (individual format, in-person, clinician-led) disorder with an attention-control group (i.e., limited education on LBP) as well as a usual care group in adults with LBP and depression, there was no between-group difference in relative BDI score reduction from baseline compared with the education controls at the final 24-week follow-up (−3.9 vs. −2.1 points; *P* = .07).[36] However, the SMP group experienced a statistically significant reduction in BDI compared with usual care controls (−3.9 vs. −1.8 points; *P* < .05).[36] This study was assessed as having a high RoB due to very high loss to follow-up in all study groups (i.e., > 40%), insufficient description of randomization procedures, and imbalances in baseline characteristics.

- Notably, in instances where statistically significant between-group depression outcomes were reported, the magnitude of the differences did not met the 5-point clinically meaningful threshold established for the BDI.[63]

No relevant subgroup analyses were reported in any of the 10 studies reporting depression outcomes.

Self-Efficacy

Thirteen RCTs reported self-efficacy outcomes (N = 1,599).[28,29,31-33,35,37-39,41-44] Self-efficacy is typically measured through patient-reported outcomes scales to assess the degree to which patients feel capable of managing their symptoms and keeping their condition from interfering with activities of daily living. Studies that reported these outcomes used a range of validated scales to assess self-efficacy: 6 studies used the Arthritis Self Efficacy Scale (ASES)[31,32,38,39,41,42]; 2 studies used the Pain Self-Efficacy Questionnaire[33,35]; and 1 study each used the Coping Strategies Questionnaire,[43] Self-Regulatory Self-Efficacy and Mobility-Related Self-Efficacy scales,[44] Self-Efficacy for Walking scale,[29] Self-Efficacy for Chronic Disease scale,[28] and the University of Washington Self-Efficacy Scale.[37] Two studies also looked at related measures of patient activation using the Patient Activation Measure[31,37] Across the reported self-efficacy measurement scales, higher scores indicated better self-efficacy or activation.[64] For detailed information on each measurement scale, including scale ranges and interpretation instructions, see Appendix D, Table D3.

At final study follow-up (range, 12 to 104 weeks), results were mixed: 9 of the 13 studies (N = 953)[28,29,31,33,35,37,38,41,44] reported no significant difference between groups in terms of self-efficacy, and 4 studies (N = 646)[32,39,42,43] reported statistically higher self-efficacy scores in SMP groups compared with controls (Table 2; Appendix D, Table D6). Among studies with multiple follow-up timepoints, results at the postintervention follow-up generally aligned with end-of-study self-efficacy outcomes. However, 2 studies reported statistically significant between-group differences favoring SMPs immediately postintervention that were attenuated at the final study follow-up[35,37] and 2 studies only observed significant between-group differences at the final follow-up timepoint.[41,43]

Statistically significant treatment-related differences in self-efficacy were reported for all follow-up timepoints in 3 of the 4 studies with observed treatment differences.[32,39,42] All 3 studies used the ASES to assess self-efficacy, which has an overall score range of 10 to 100 that is commonly adjusted to a range of 1 to 10 in contemporary use. For the purposes of this review, we reported scores as measured in the study. Although ASES scores have been shown to relate to functional status and health outcomes in validation studies,[65,66] we were not able to identify an established threshold for clinically significant score change.[64]

- In the Living Healthy cluster RCT of adults with diabetes and chronic pain (N = 230), both study groups experienced improved pain self-efficacy from baseline at the 12-week postintervention timepoint, but the SMP group experienced a statistically greater increase in scores compared with the education control group after adjusting for age, sex, body mass index, smoking status, high-fat food intake, baseline pain coping score, and depressive symptoms (+21.5 points vs. +4.6 points; $P < .001$).[32] The magnitude of score differences from baseline were sustained at the final 52-week follow-up (+23.7 points vs. +6.8 points; P <.001).[32,52]

- The STAART trail enrolled African American adults with osteoarthritis (N = 248) who were randomized to 12 weeks of culturally tailored pain coping skills training (i.e., SMP group) or a wait-list control group (N = 248).[42] ASES scores were significantly higher in the SMP group compared with controls after adjusting for sex, body mass index, working status, education level, and baseline score at both the 12-week post-intervention follow-up (6.7 points vs. 5.7 points; $P < .001$) and at the final 36-week follow-up (6.3 points vs. 5.7 points; $P = .002$), despite a decrease in score in the SMP group.[42]
- In the RAHelp trial which compared a 10-week online SMP (i.e., RAHelp.org) and telephone support with a wait-list control group among adults with RA (N = 108), the SMP group had significantly higher self-efficacy scores at the single 46-week follow-up compared with controls (84.1 points vs. 68.6 points; $P < .001$).

One study that observed treatment differences used the Coping Strategies Questionnaire to measure self-efficacy.[43]

- In the PACe-LBP pilot study, adult veterans with LBP (N = 60) who were randomized to a 12-week, telephone-supported combined SMP and physical activity promotion intervention experienced a significantly greater improvement in self-efficacy scores at the single 12-week follow-up compared with a group who only received the physical activity intervention, but did not exhibit a significant difference compared with a wait-list control group (Appendix D, Table D4).[43] As with the ASES, it is unclear whether the difference compared with the physical activity group is clinically significant as no threshold has yet been established.[64] This study was assessed as having a moderate RoB due to substantial loss to follow-up (i.e., > 20%) and uncertainty whether the results reflect an intention-to-treat analysis.

Neither trial assessing measures of patient activation (TakeCharge and ECLIPSE) observed a difference between study groups at the final follow-up.[31,37] However, veterans with chronic musculoskeletal pain randomized to the SMP group in the ECLIPSE trial had significantly higher Patient Activation Measure scores at the 11-week post-intervention follow-up (78.8 points vs. 71.9 points; $P < .05$), although the statistically significant difference was attenuated at the subsequent 24 and 52-week follow-up assessments.[31]

With the exception of the PACe-LBP trial, none of the studies assessing self-efficacy included comparisons of SMP or other study elements, or conducted relevant subgroup analyses.

Medication Use

Three RCTs reported medication use outcomes (N = 1,098).[30,31,35] All 3 studies assessed measures of opioid usage; 2 studies looked at the effect of SMPs versus usual care on measures of opioid use and changes in opioid-related problems in adults with mixed chronic pain conditions and a history of long-term opioid therapy,[30,35] and 1 study compared the number of opioid medications used during the study in veterans with chronic musculoskeletal pain who were randomized to an SMP or a brief education class.[31] One study additionally assessed rates of benzodiazepine use.[30]

Few intervention-related differences were observed in any measure of medication use (Appendix D, Table D7). In the 2 studies comparing SMP programs with usual care in mixed chronic pain populations

with concurrent long-term opioid use, there were no statistically significant between-group differences at any follow-up timepoint (range, 12 to 52 weeks) in terms of:

- Mean daily opioid dose (in morphine milligram equivalents)[30,35]
- Change in opioid dose from baseline[30,35]
- Participants with continued long-term opioid use (i.e., ≥ 70-day supply per 90-day period)[30]
- Participants with an average daily opioid dose ≥ 90 morphine milligram equivalents[30]
- Opioid concerns (Prescription Opioid Difficulties Scale)[35]
- Opioid craving (Opioid Craving scale)[35]
- Risk for opioid misuse (Prescription Opioid Misuse Index)[35]

Similarly, in the ECLIPSE trial (N = 213) comparing an SMP with a brief education intervention in veterans with chronic musculoskeletal pain, there were no between-group differences in the number of unique opioid prescriptions listed in participants' medical records at the final 36-week follow-up (0.7 vs. 0.6 prescriptions; *P* = .49).[31]

Both studies of mixed chronic pain populations observed inconsistent treatment-related effects for a subset of medication use outcomes between the first postintervention timepoint and the final follow-up.

- In the 2017 trial conducted by Sullivan and colleagues (N = 35), the SMP group reported significantly fewer opioid-related psychosocial problems (e.g., trouble concentrating), as measured by the Prescription Opioid Difficulties Scale at the 22-week postintervention follow-up, compared with the control group (2.94 vs. 7.53 points [lower score denotes fewer problems]; *P* = .02), but these differences were no longer significant at the final 34-week follow-up.[35]
- In the PPACT trial (N = 850), there were no between-group differences in participants with benzodiazepine use immediately postintervention (i.e., 12 weeks); however, relatively fewer participants in the SMP group were receiving benzodiazepines at the end of the 52-week follow-up period compared with the control group (15.7% vs. 22.9%; RR, 0.77; 95% CI, 0.63 to 0.95).[30]

Health Resource Use

One RCT, the ECLIPSE trial (N = 215), assessed health resource use outcomes.[31] Veterans with chronic musculoskeletal pain were randomized to either 6 months of bimonthly individual in-person or telephone-based peer coaching sessions (12 sessions total) in pain self-management or to an attention control group who received a single 2-hour pain self-management class.[31]

At 36 weeks of follow-up, there were no statistically significant between-group differences in the average number of (Appendix D, Table D7)[31]:

- Phone or secure message communications
- Emergency department visits
- Outpatient visits
- Hospitalizations
- Hospitalized days

Throughout the ECLIPSE trial, engagement with assigned group activities was low in both study groups (only 11 participants [13.1%] completed 12 or more sessions in the SMP group, and only 34 participants [36%] attended the education class in the control group) thereby limiting the ability to draw conclusions

about the comparative effects of the intervention at the intended dose.[31] However, when analyses were limited to patients with an adequate intervention dose, defined as 6 or more reported peer coaching sessions (N = 30; 35.7%), health resource use outcomes at 36 weeks did not differ compared with the control group.[31]

Evidence Summary and Review Limitations

We identified 18 US-based RCTs evaluating the comparative effectiveness of SMPs in adult individuals with chronic pain.[28-45] Most of the included studies reported QoL and self-efficacy outcomes, about half reported depression outcomes, and few studies reported medication use or health resource use outcomes (Table 2). When clinical outcomes were reported, few between-group differences were observed, and outcomes showing a statistical benefit favoring SMPs rarely met the threshold for clinical significance. In the following summary of the overall strength of the evidence for key health outcomes, *low* and *very-low* levels of confidence indicate that if new information from additional studies were published, our understanding of the evidence would likely change. The overall body of evidence was further assessed for the direction of effect: *mixed effects* indicates that there was substantial variation in the direction of effect for the given outcome (> 50% variation by study or sample size); *no effect* indicates that all or most studies for a given outcome observed no difference between the intervention and control groups.

- We found **very low–confidence evidence** of **mixed effects** for overall QoL (13 RCTs; N = 2,225), pain-related QoL (14 RCTs; N = 2,734), depression (10 RCTs; N = 1,556), and self-efficacy (13 RCTs; N = 1,599). The very low–confidence ratings were largely attributable to RoB concerns (e.g., insufficient blinding procedures, substantial study attrition), inconsistent effect estimates between studies, and substantial heterogeneity in intervention design and outcomes measurement. For all 4 outcomes, studies showed mixed effects of either no difference between study groups or significant effects favoring the SMP group.
- We found **low-confidence evidence** of **no effect** for medication use outcomes (3 RCTs; N = 1,098). This assessment was based on a lack of consistent between-group differences in measures of opioid or benzodiazepine use. The low confidence rating was due to RoB concerns (e.g., insufficient blinding procedures, substantial study attrition) and indirectness from differences in outcomes measurement between studies.
- We found **very low–confidence evidence** of **no effect** for health resource use outcomes (1 RCT; N = 215). This assessment was based on a lack of significant between-group findings in any relevant measure including emergency department visits, hospitalizations, outpatient visits, and direct communications with clinicians. The very low–confidence rating was due to RoB concerns (e.g., insufficient blinding procedures, substantial study attrition), limited generalizability to a broader chronic pain population (single study restricted to patients with musculoskeletal pain), and low adherence (i.e., < 50%) to the assigned intervention.

Although variation among interventions and reported outcomes is common in many systematic evidence reviews, the expansive nature of this review scope presented unique challenges to evidence synthesis.

- **Variation in condition types:** The intended aim of this review was to assess the effectiveness of SMPs for individuals with chronic pain of any type. However, a limited subset of conditions was represented in the included studies, with the majority of studies looking at populations with arthritis and LBP. As the experience of chronic pain is complex, varying across conditions and

between patients with the same condition, it may not be possible to generalize the findings of this evidence to all patients with chronic pain.

- **Variation in SMP structure and content:** Beyond the Stanford-developed CDSMP, there is no consensus definition as to what constitutes a standard or highly effective SMP, so many types of programs with a wide range of configurations met our SMP inclusion criteria. To that end, there was limited overlap in overall SMP design among RCTs, and there was substantial variation in program durations, contact intensity, meeting format, meeting location, modalities, facilitators, and content. Moreover, the majority of SMPs summarized in this review were tailored directly to the clinical needs of their study populations and were facilitated by clinicians, which may not be generalizable to the typical participant experience as the most widely available SMP (the Stanford-developed CDSMP) is peer-led and open to participants with any chronic condition.
- **Variation in clinical tools to evaluate key outcomes:** Included studies used a wide range of validated assessment scales for each outcome, thereby limiting our ability to make direct comparisons across studies, and necessitating a high-level directional analysis.

These variations challenged our ability to isolate or attribute the observed patterns of outcomes to any specific differences in study populations or interventions. Moreover, this level of study heterogeneity, in addition to RoB concerns, low intervention fidelity, and inconsistent findings among studies, resulted in very low- to low-confidence ratings across the body of evidence.

Among the included studies, the PPACT cluster RCT [30] provides the most direct and highest-quality evidence for addressing the aims of this review as scoped. This 52-week trial compared a 12-week, CBT-based SMP to usual care among 850 participants with mixed chronic pain conditions and a history of long-term opioid therapy treated in 106 primary care clinics in 3 US regions (southeast, northwest, Hawaii).[30] To accommodate variations in primary care resources and practice, investigators implemented a pragmatic study design that incorporated the following practices[30]:

- Patients with a range of pain conditions were eligible, and exclusions due to multimorbidity, pain severity, or functional limitations were minimized.
- Existing clinical staff at participating primary care practices delivered the intervention, and use of additional non-study pharmacologic and behavioral therapies was not restricted.
- Outcomes included patient-reported assessments typically used in primary care or relied on health care use data available in electronic health records.
- Participants were contacted for follow-up regardless of intervention adherence or continued insurance coverage.

Were more studies to become available that incorporate similar elements to the PPACT trial (i.e., large sample size, mixed chronic pain populations, wide geographic study range, longer-term follow-up, evidence-based SMP content, and pragmatic study design), our ability to make higher-confidence ratings regarding SMPs for general chronic pain conditions would likely improve.

Ongoing Studies

We identified 9 potentially relevant, US-based ongoing clinical trials assessing SMPs for adult individuals with chronic pain, from searches of ClinicalTrials.gov conducted in October 2023.[67-75] See Appendix D, Table D8 for individual study characteristics.

- Five studies are assessing mixed chronic pain populations with long-term opioid use or opioid use disorder,[67,69,70,72,75] and 1 study each is assessing individuals with chronic neck or LBP,[71] urologic chronic pelvic pain syndrome,[73] HIV-related pain,[74] and chronic pain associated with physical disability.[68] In addition to chronic pain criteria, 1 study limited enrollment to Latino populations,[71] another requires all participants to be employed,[68] and 1 study is limited to individuals with unhealthy drinking behaviors.[74]
- Three studies are being conducted in community settings,[67,68,74] 4 in primary care settings,[69,71,72,75] and 2 are in specialty care settings (i.e., nephrology,[70] urology[73]).
- SMP durations range from 6 to 24 weeks, with most being conducted over a 10-week to 12-week period; all but 1 program met for at least 1 hour on a weekly basis. There is minimal overlap in overall SMP design across the ongoing studies; however, most of the SMPs are structured as individual interventions, the most common program delivery modes are telephone and online videoconferencing, and the majority of programs are clinician-led. Limited information on SMP content is available in the study registries, but several SMPs reportedly incorporate common behavioral therapy techniques such as CBT and motivational interviewing.
- Six studies are comparing the SMP interventions with usual care or wait-list groups[67-71,75] and 3 studies have education-based attention control comparators.[72-74] Education control groups generally receive brief advice or information about healthy behaviors that does not include information about self-management techniques (e.g., goal-setting).
- Pain-related QoL is a primary outcome in all 9 ongoing studies; depression, overall QoL, and self-efficacy are the next most common outcomes (reported in > 5 studies each), followed by medication use (4 studies) and health resource use (2 studies). In studies evaluating medication use, the focus is largely on opioid- or benzodiazepine-related outcomes.
- Across the eligible studies, estimated study enrollment ranges from 138 to 643 participants and planned study durations range from 12 to 52 weeks. Estimated primary completion dates range from April 2021 to July 2027, with 2 studies[67,69] likely to publish in the next year on the basis of having achieved primary study completion prior to 2023.

POLICY LANDSCAPE

In the following section, we summarize key recommendations regarding SMPs for chronic pain populations from evidence-based clinical guildelines, developed by professional societies and governmental health agencies, and report on SMP coverage policies from select public and private payers.

Evidence-Based Recommendations

We identified 8 clinical practice guidelines that evaluated published clinical effectiveness literature to inform recommendations about the use of SMPs among individuals with chronic pain conditions (Table 3). Five of these guidelines had good methodologic quality,[76-80] 2 guidelines had fair methodologic

quality,[81,82] and 1 guideline had poor methodologic quality (see Appendix C for guideline methodologic assessment methods).[83] These guidelines were published by a range of professional and governmental organizations including:

- American College of Rheumatology (ACR)
- Arthritis Foundation
- European Alliance of Associations for Rheumatology (EULAR)
- National Institute for Health and Care Excellence (NICE)
- Osteoarthritis Research Society International (OARSI)
- Pain Management Best Practices Interagency Task Force
- US Veterans Administration/ US Department of Defense (VA/DoD)

Eligible guidelines addressed a range of chronic pain populations including osteoarthritis,[76,80] rheumatoid arthritis,[78,81,82] LBP,[77] and general chronic pain.[79,83] With the exception of 1 guideline that solely assessed self-management definitions and strategies in the context of inflammatory arthritis,[81] SMP recommendations were largely embedded in broader guidelines for the assessment and management of pain-related conditions and were generally assessed as complementary or adjunctive care elements to other primary treatment strategies for pain.

Table 3 and Appendix D, Table D9 provide high-level summaries of guideline recommendations regarding SMPs for chronic pain, along with a summary of recommended elements of SMP design, including format, modality, facilitator types, content, and place in therapy. Except for NICE, these clinical guidelines recommended the use of self-management interventions as either complementary or adjunctive care for chronic pain. Most guidelines recommended delivery of self-management interventions as part of a synchronous, structured education format (group or individual, in-person or online) provided by trained clinical or peer facilitators. The guidelines also largely agreed that SMPs should include content addressing treatment adherence, problem solving and goal setting, emotional well-being and CBT, disease-specific or condition-specific education (e.g., relapse prevention), and healthy behaviors (e.g., sleep hygiene, tobacco cessation).

TABLE 3. SELF-MANAGEMENT RECOMMENDATIONS FROM CLINICAL PRACTICE GUIDELINES

GUIDELINE (YEAR) QUALITY RATING	OVERALL SMP RECOMMENDATION	RECOMMENDED SMP COMPONENTS			
		FORMAT	FACILITATORS	CONTENT	PLACE IN THERAPY
GENERAL CHRONIC PAIN					
NICE (2021)[79] Good quality	Unable to recommend for or against SMPs for general chronic pain populations[a] due to lack of evidence of benefit	No recommendations made due to heterogeneity in delivery modalities, intensity, duration, staffing, aims, and content of programs assessed in the included clinical effectiveness literature			
Pain Management Best Practices Interagency Task Force (2019)[83] Poor quality	Recommended as a key component of pain management	Any established treatment modality ■ In-person ■ Video calls ■ Mobile apps ■ Telephone ■ Group sessions ■ Individual counseling	Clinicians or peers with specific pain education training	Culturally tailored and inclusive of: ■ CBT and coping skills ■ Pain education ■ Problem-solving and skill-building ■ Relaxation and stress reduction ■ Treatment adherence	Complementary to all other therapies
OSTEOARTHRITIS					
ACR/Arthritis Foundation (2020)[76] Good quality	Strongly recommended for patients with OA	■ Group-based ■ Synchronous (in-person or online)	■ Clinicians ■ Peers	■ OA education ■ Healthy behaviors ■ Problem-solving and skill-building ■ Treatment adherence	■ Standalone ■ Adjunctive to physical therapy
OARSI (2019)[80] Good quality	Recommended for patients with OA and OA-related comorbidities	NR	NR	NR	NR
INFLAMMATORY OR RHEUMATOID ARTHRITIS					

GUIDELINE (YEAR) QUALITY RATING	OVERALL SMP RECOMMENDATION	RECOMMENDED SMP COMPONENTS			PLACE IN THERAPY
		FORMAT	FACILITATORS	CONTENT	
ACR (2022)[78] Good quality	Recommended for patients with RA	■ Standardized, validated programs only[b]	NR	■ CBT and coping ■ Goal-setting ■ Relaxation and stress reduction	Adjunctive to pharmacotherapy
EULAR (2022)[82] Fair quality	Recommended as an optional therapy for patients with difficult-to-treat RA	■ Individual or group-based ■ Synchronous and asynchronous modalities	■ Clinicians with rheumatology experience	■ CBT and coping ■ RA education ■ Goal setting ■ Relaxation and stress reduction	Adjunctive to pharmacotherapy
EULAR (2021)[81] Fair quality	Recommended as part of routine care for patients with inflammatory arthritis conditions	■ Individual or group-based ■ Synchronous ■ Supplemental phone calls and media encouraged	■ Clinicians ■ Peers	■ CBT and coping ■ Arthritis education ■ Effective communication ■ Goal setting ■ Healthy behaviors ■ Problem-solving and skill-building ■ Treatment adherence	Core therapy in addition to all other treatments for arthritis
LOW BACK PAIN					
VA/DoD (2019)[77] Good quality	Strongly recommended patient education and self-care interventions for all patients with low back pain	NR	■ Clinicians	■ CBT and coping ■ Healthy behaviors ■ Relaxation and stress reduction	NR

Notes. [a] Due to the limited evidence of effect found for SMPs in general chronic pain populations, committee directed readers to reference other condition-specific NICE guidelines for further SMP recommendations; SMPs are currently recommended by NICE for rheumatoid arthritis, osteoarthritis, and low back pain. [b] Example programs listed by guideline authors: Arthritis Self-Management Program, Chronic Disease Self-Management Program, Better Choices Better Health, Tomando Control de su Salud, Rheumatoid Arthritis Self-Management Intervention, OPERAS (an On-demand Program to EmpoweR Active Self-management).

Abbreviations. ACR: American College of Rheumatology; CBT: cognitive behavioral therapy; EULAR: European Alliance of Associations for Rheumatology; NICE: National Institute of Health and Care Excellence; NR: not reported; OA: osteoarthritis; OARSI: Osteoarthritis Research Society International; RA: rheumatoid arthritis; SMP: self-management program; VA/DoD: United States Departments of Veterans Affairs and Defense.

General Chronic Pain

We identified 2 guidelines that made recommendations about SMPs for individuals with any chronic pain condition.[79,83]

National Institute on Health Care and Excellence (2021)

In 2021, NICE released guidelines regarding the assessment and management of all chronic pain in individuals aged 16 or above, for which they reviewed evidence regarding the effectiveness of pain management programs.[79] We assessed this guideline as having good methodologic quality due to inclusion of a well-conducted systematic evidence review and clear methods reporting. In the guideline and related systematic review, pain management programs were defined as any intervention with at least 1 physical and 1 psychological component, delivered by trained facilitators, with some coordinating structure connecting the 2 components (e.g., structured modules or sessions).[79] Ultimately, the guideline committee was unable to make a recommendation for or against pain management programs applying to all chronic pain populations.[79] For this decision they cited a lack of evidence of clinical benefit, or limited evidence of benefit, with small effect sizes for QoL and other outcomes compared with usual care; there was also insufficient evidence to determine the cost-effectiveness of these programs.[79] Given these conclusions, the committee directed readers to cross-reference other NICE guidelines for pain condition-specific recommendations regarding SMPs,[79] which are summarized below:

- Recommended SMPs as complementary therapy for rheumatoid arthritis,[84] LBP and sciatica,[85] and osteoarthritis[86]
- Recommended more research regarding SMPs for endometriosis,[87] headache disorders,[88] and irritable bowel syndrome[89]
- Did not discuss SMPs for neuropathic pain[90] or spondyloarthritis[91]

The committee also declined to make any recommendations regarding the content or characteristics of an optimal SMP, citing substantial heterogeneity in program delivery methods, intensity, duration, staffing, aims, and content.[79] Moreover, the committee did not make a recommendation for more research regarding the elements of effective pain programs due to the differences in patient experience across pain conditions.[79]

Pain Management Best Practices Interagency Task Force (2019)

In 2019, the Pain Management Best Practices Interagency Task Force released their final report detailing gaps, challenges, and recommendations regarding comprehensive pain management in the US.[83] We rated this guideline as having poor methodologic quality due to a lack of clear methods reporting and insufficient RoB assessment of the literature. The task force was established by federal legislation as part of the 2016 Comprehensive Addiction and Recovery Act and was composed of 29 members with expertise in pain management, patient advocacy, addiction, mental health, and minority health, including representatives from 8 federal agencies, 9 health care–related organizations, and 12 members of the public.[83] The resulting report was informed by a review of clinical literature, expert testimony, and public comment.[83]

The task force concluded that behavioral health interventions, including SMPs, should be considered a key component of multidisciplinary pain management, and made the following recommendations applicable to self-management for chronic pain[83]:

- Self-management skills training may include relaxation, pacing, cognitive restructuring (e.g., CBT), maintenance planning, and relapse prevention
- Self-management and patient education programs should ideally be facilitated by individuals with specific pain education training
- Interventions should incorporate the full range of treatment delivery modalities (e.g., in-person, telehealth, internet self-management, mobile applications, group sessions, telephone counseling)
- Interventions should be informed by the biopsychosocial model and culturally tailored to reduce disparities in self-management

The task force additionally recognized several key challenges to implementing and ensuring access to high-quality self-management interventions, including[83]:

- A lack of consistency, standardization, and comprehensive information in current educational materials and interventions (e.g., SMPs) for patients with chronic pain
- Uncertain reimbursement pathways for behavioral and integrative care interventions across the full range of care delivery modalities
- Limited provider education regarding the effectiveness and availability of self-management interventions

Osteoarthritis

We identified 2 guidelines that assessed SMPs for individuals with osteoarthritis.[76,80]

American College of Rheumatology and the Arthritis Foundation (2019)

In a 2019 joint guideline, the ACR and Arthritis Foundation strongly recommended self-efficacy and SMPs for patients with hand, hip, or knee OA.[76] We assessed this guideline as having good methodologic quality. These programs were recommended on the basis of a supporting systematic review that found moderate-certainty evidence from 23 RCTs that SMPs either resulted in no difference compared with usual care for osteoarthritis or were associated with improvements in pain management, functional status, and QoL.[76] These recommendations were also supported by minimal risk of harms.[76] Although guideline authors noted a lack of consensus in the clinical literature regarding the design of SMPs, the committee recommended that osteoarthritis patients participate in synchronous, group-based SMPs (in-person or online), led by trained clinical or peer facilitators, and that include multidisciplinary sessions on skill-building, disease education, medication adherence, and physical exercise.[76] Self-management and self-efficacy interventions were strongly recommended as standalone therapies for osteoarthritis as well as adjunctive elements to enhance the effectiveness of exercise programs.[76]

Osteoarthritis Research Society International (2019)

Self-management interventions were also conditionally recommended for patients with knee, hip, or polyarticular osteoarthritis in a 2019 guideline issued by OARSI.[80] The panel additionally recommended SMPs for patients with osteoarthritis and at least one of the following common comorbidities in osteoarthritis populations: gastrointestinal (e.g., IBS), cardiovascular (e.g., hypertensions, coronary artery disease), frailty, or widespread pain or depression.[80] These recommendations were supported by

low- to moderate-certainty evidence from 4 RCTs indicating either no difference or improvement with SMPs compared with usual care on a range of pain, functional, and QoL outcomes.[80] No adverse events were observed in any of the included trials.[80] Although SMPs received favorable conditional recommendations for all assessed osteoarthritis groups, the voting panel did not make any recommendations regarding the structure or content of an optimal SMP. We assessed this guideline as having good methodologic quality.

Inflammatory or Rheumatoid Arthritis

We identified 3 guidelines that assessed SMPs for individuals with RA or other inflammatory arthritis types.[78,81,82]

American College of Rheumatology (2022)

In 2022, the ACR issued a guideline on nonpharmacologic interventions for RA in which they recommended SMPs for patients with RA as adjunctive therapy to pharmacologic treatments.[78] The recommendation was made under the condition that patients participate in SMPs with standardized curricula and operating procedures (e.g., the Arthritis Self-Management Program), compared with ad hoc or non-validated programs.[78] This recommendation was based on low-certainty evidence from clinical trials of improved physical function and pain, as well as testimony from a patient panel regarding the QoL and mental health benefits of the types of supports provided by SMPs.[78] Although the guideline authors did not specify elements of an optimal SMP, the voting panel made additional recommendations in favor of integrative therapies that are common to SMPs, including CBT and mind-body approaches such as goal setting, mindfulness, and breathing exercises.[78] We assessed this guideline as having good methodologic quality.

European Alliance of Associations for Rheumatology (2021 and 2022)

EULAR published recommendations for the implementation of self-management strategies for patients with inflammatory arthritis conditions (RA, psoriatic arthritis, axial spondylarthritis) in 2021.[81] We rated this guideline as having fair methodologic quality due to a lack of external review and inadequate description of updating procedures. The task force included a multidisciplinary panel of clinicians with expertise in rheumatology, nursing, occupational therapy, psychology, self-management, exercise physiology and physiotherapy, as well as patient representatives from 11 European countries.[81] The resulting published guidance outlined a series of recommendations regarding effective self-management strategies for inflammatory arthritis populations.[81]

Overall, the task force recommended the integration of self-management interventions as a part of routine care for all patients with inflammatory arthritis conditions.[81] Based on a review of 19 RCTs and expert opinion, authors specified that patient education, although not sufficient alone, should be the primary framework guiding all self-management activities.[81] The task force additionally re-endorsed a separate 2015 EULAR guideline in which the task force recommended that patient education interventions for individuals with inflammatory arthritis[92]:

- Be offered throughout the course of the disease
- Include individually tailored and needs-based content
- Occur in synchronous group or individual sessions (in-person or online)
- Include evidence-based techniques (e.g., CBT)

- Be facilitated by health professionals or patient peers with specific training in delivering the intervention
- Take place in health care or community settings

In addition to these recommendations, the 2021 guidelines specified several critical content areas that should be addressed by self-management interventions including[81]:

- Treatment adherence
- Problem solving and goal setting
- Emotional well-being and mental health
- Physical activity encouragement
- Healthy behaviors (e.g., balanced diet, smoking cessation, sleep hygiene)

Finally, the task force directed health care providers to work proactively with patients to connect them with relevant clinical, occupational, and community self-management resources.[81]

In addition to the overarching guideline on self-management for inflammatory arthritis, the EULAR published a "points to consider" document in 2022 detailing evidence-based recommendations for the management of difficult-to-treat RA, a complex population characterized by failure to reach low disease activity or remission after multiple cycles of conventional pharmacotherapy.[82] We also rated this guideline as having fair methodologic quality because no apparent external review was undertaken. The points to consider approach (versus a full guideline) was undertaken due to the known paucity of literature specific to this population; as such, the recommendations are largely supported by indirect evidence from studies of treatment-responsive RA populations or expert opinion.[82,93] In alignment with their guidelines for inflammatory arthritis, the reviewing task force recommended that providers consider offering referral to SMPs for individuals with difficult-to-treat RA as an optional measure to optimize the effects of their primary pharmacologic regimen.[82] The publication authors also reaffirmed the importance of individually tailored or one-on-one self-management interventions for pain control in this population, due to the complex nature of the condition including the high occurrence of overlapping pain conditions.[82]

Low Back Pain

We identified 1 guideline that assessed SMPs for individuals with chronic LBP.[77]

US Department of Veterans Affairs and US Department of Defense (2019)

The VA/DoD strongly recommended providing structured, evidence-based patient education and self-care information for patients with chronic LBP in a 2019 joint guideline.[77] We assessed this guideline as having good methodologic quality. Guideline authors endorsed providing information regarding back pain, the importance of remaining active, and critical healthy behaviors (e.g., tobacco cessation).[77] The voting panel also issued recommendations for several nonpharmacologic interventions that are common components of many SMPs, including CBT, neurophysiologic education, and mindfulness, based on evidence suggesting that these interventions reduce pain-related catastrophizing and increase acceptance in patients with LBP.[77] No guidance was given regarding recommended intervention components, duration, or facilitator training for patient education and self-care interventions.[77]

Payer Coverage Policies

We did not identify coverage policies for Washington State's Medicaid program or national or local coverage determinations for Medicare related to SMPs for chronic pain.

We identified coverage policies related to SMPs for chronic pain populations from 2 private payers (Aetna and Moda), but we did not identify coverage policies related to these programs for Cigna or Regence BlueCross BlueShield of Oregon (Regence).

Of note, several payers we reviewed (Medicare, Washington State Medicaid, Cigna, Regence) currently offer coverage for diabetes-related SMPs,[94-97] but do not appear to extend this coverage to patients with chronic pain or other chronic conditions. Other providers without chronic pain-specific coverage policies appear to offer self-management support through complementary wellness services, such as Cigna's Your Health First chronic condition coaching and advocacy program[98] or Regence's partnership with the Portland Clinic to offer pain management education.[99]

Aetna

Aetna offers coverage for outpatient medical self-care programs for members with chronic back pain, called Back School, as well as to other "recognized" self-care programs for other chronic conditions on a case-by-case basis.[100] Recognized self-care programs are considered for coverage when all of the following conditions are met[100]:

- The program consists of services provided by recognized health care professionals (e.g., doctors, registered nurses, social workers, physical therapists, dietitians, respiratory therapist); *AND*
- The program is coordinated with Aetna's Patient Management Department (in Aetna network plans); *AND*
- The program is designed to educate the member about specific conditions and lifestyle changes necessary as a result of the medical condition; *AND*
- The program is directed and supervised by a physician; *AND*
- The program is prescribed by the attending physician for a member with a medical condition amenable to self-care (e.g., diabetes, chronic back pain, chronic pulmonary disease or cardiac disease)

Aetna further specifies that although duration of self-care programs vary, participation in these programs is considered medically necessary once per lifetime for a particular condition.[100] Additional episodes of illness (e.g., second heart attack) or new chronic diagnoses may qualify a member for participation in another program.[100]

Aetna does not cover programs that[100]:

- Are available to the public without charge
- Include only general health or lifestyle education
- Consist of services not generally accepted as necessary or appropriate for management of the member's diagnosed condition or injury
- Are focused on returning to work or vocational rehabilitation, rather than the treatment of a disease or injury

Moda

Moda offers coverage for an initial SMP course (10 to 16 weeks of duration) that is chronic pain–related, also known as a "pain school," when all of the following criteria are met[101]:

- The program is directed and overseen by a licensed practitioner or a program with a Certificate of Approval from the Oregon Health Authority; *AND*
- The program incorporates a multidisciplinary approach including at a minimum psychoeducation, movement, mindfulness training, and coordination with medical providers; *AND*
- The patient has a documented chronic pain condition substantially interfering with functioning or QoL; *AND*
- Planned treatment interventions are geared toward assisting the patient to gain self-efficacy, increase knowledge of the dynamics of pain, and improve daily functioning

To receive coverage for subsequent courses of pain school, Moda requires that patients meet all of the following criteria[101]:

- The patient has made documented progress in the initial course of treatment; *AND*
- The patient has not fully resolved the issues leading to the initial course of treatment; *AND*
- Continued treatment is reasonably expected to facilitate further clinical progress

The policy additionally states that coverage authorization may be terminated if treatment is successfully completed, or if the patient is not making progress with further participation unlikely to produce improvement.[101]

Under Moda's current policy, participation in this program is subject to prior authorization approval requiring that providers submit[101]:

- Documentation of a chronic pain diagnosis
- Results of a biopsychosocial assessment including a description of medical issues contributing to pain, as well as any relevant mental health or substance use concerns
- A treatment plan that includes defined treatment goals, planned interventions, and coordination of care with medical providers
- (For ongoing approval) A summary of progress and an updated treatment plan.

REFERENCES

1. National Center for Health Statistics. Chronic Pain and High-impact Chronic Pain Among U.S. Adults, 2019. NCHS Data Brief, no 390. https://www.cdc.gov/nchs/data/databriefs/db390-H.pdf. Accessed September 11, 2023.

2. U.S. Census Bureau. QuickFacts: Oregon. 2022; https://www.census.gov/quickfacts/fact/table/OR/PST045222. Accessed September 11, 2023.

3. Rikard SM, Strahan AE, Schmit KM, Guy GP, Jr. Chronic Pain Among Adults - United States, 2019-2021. *MMWR Morb Mortal Wkly Rep.* 2023;72(15):379-385. doi: 10.15585/mmwr.mm7215a1.

4. Interagency Pain Research Coordinating Committee. National pain strategy report. 2016; https://www.iprcc.nih.gov/node/5/national-pain-strategy-report. Accessed October 20, 2023.

5. Gaskin DJ, Richard P. The economic costs of pain in the United States. *J Pain.* 2012;13(8):715-724. doi: 10.1016/j.jpain.2012.03.009.

6. Lorig K. Chronic disease self-management program: insights from the eye of the storm. *Front Public Health.* 2014;2:253. doi: 10.3389/fpubh.2014.00253.

7. Allegrante JP, Wells MT, Peterson JC. Interventions to support behavioral self-management of chronic diseases. *Annu Rev Public Health.* 2019;40:127-146. doi: 10.1146/annurev-publhealth-040218-044008.

8. Centers for Disease Control and Prevention. Sorting Through the Evidence for the Arthritis Self-Management Program and the Chronic Disease Self-Management Program: Executive Summary of ASMP/CDSMP Meta-Analyses. 2011; https://www.cdc.gov/arthritis/docs/asmp-executive-summary.pdf. Accessed September 11, 2023.

9. Oregon Health Authoriy Public Health Division. Health Promotion and Chronic Disease Prevention: 2017-2025 Strategic Plan. https://www.oregon.gov/oha/PH/DISEASESCONDITIONS/CHRONICDISEASE/Documents/hpcdp-strategic-plan.pdf. Accessed September 11, 2023.

10. Kessler D, McCutcheon T, Rajachandrakumar R, et al. Understanding barriers to participation in group chronic disease self-management (CDSM) programs: A scoping review. *Patient Educ Couns.* 2023;115:107885. doi: 10.1016/j.pec.2023.107885.

11. Smith ML, Ahn S, Jiang L, Kulinski KP, Ory MG. Factors associated with Hispanic adults attending spanish-language disease self-management program workshops and workshop completion. *Front Public Health.* 2014;2:155. doi: 10.3389/fpubh.2014.00155.

12. Jaglal SB, Haroun VA, Salbach NM, et al. Increasing access to chronic disease self-management programs in rural and remote communities using telehealth. *Telemed J E Health.* 2013;19(6):467-473. doi: 10.1089/tmj.2012.0197.

13. Scriven H, Doherty DP, Ward EC. Evaluation of a multisite telehealth group model for persistent pain management for rural/remote participants. *Rural Remote Health.* 2019;19(1):4710. doi: 10.22605/RRH4710.

14. Turnbull S, Cabral C, Hay A, Lucas PJ. Health equity in the effectiveness of web-based health interventions for the self-care of people with chronic health conditions: Systematic review. *J Med Internet Res.* 2020;22(6):e17849. doi: 10.2196/17849.

15. Hernon MJ, Hall AM, O'Mahony JF, Normand C, Hurley DA. Systematic review of costs and effects of self-management interventions for chronic musculoskeletal pain: Spotlight on analytic perspective and outcomes assessment. *Phys Ther.* 2017;97(10):998-1019. doi: 10.1093/ptj/pzx073.

16. Boyers D, McNamee P, Clarke A, et al. Cost-effectiveness of self-management methods for the treatment of chronic pain in an aging adult population: a systematic review of the literature. *Clin J Pain.* 2013;29(4):366-375. doi: 10.1097/AJP.0b013e318250f539.

17. Brady TJ. Cost implications of self-management education intervention programmes in arthritis. *Best Pract Res Clin Rheumatol.* 2012;26(5):611-625. doi: 10.1016/j.berh.2012.09.001.

18. Smith DH, O'Keeffe-Rosetti M, Leo MC, et al. Economic Evaluation: A Randomized Pragmatic Trial of a Primary Care-based Cognitive Behavioral Intervention for Adults Receiving Long-term Opioids for Chronic Pain. *Med Care.* 2022;60(6):423-431. doi: 10.1097/MLR.0000000000001713.

19. Merlin JS, Westfall AO, Johnson MO, et al. Cost-effectiveness of a chronic pain intervention for people living with HIV (PLWH). *J Med Econ.* 2018;21(2):122-126. doi: 10.1080/13696998.2017.1377719.

20. Geneen LJ, Moore RA, Clarke C, Martin D, Colvin LA, Smith BH. Physical activity and exercise for chronic pain in adults: an overview of Cochrane Reviews. *Cochrane Database Syst Rev.* 2017;4(4):CD011279. doi: 10.1002/14651858.CD011279.pub3.

21. Joling KJ, van Marwijk HW, Veldhuijzen AE, et al. The two-year incidence of depression and anxiety disorders in spousal caregivers of persons with dementia: who is at the greatest risk? *Am J Geriatr Psychiatry.* 2015;23(3):293-303. doi: 10.1016/j.jagp.2014.05.005.

22. Kim Y, Carver CS, Shaffer KM, Gansler T, Cannady RS. Cancer caregiving predicts physical impairments: roles of earlier caregiving stress and being a spousal caregiver. *Cancer.* 2015;121(2):302-310. doi: 10.1002/cncr.29040.

23. Tsuji H, Tetsunaga T, Tetsunaga T, et al. Factors influencing caregiver burden in chronic pain patients: A retrospective study. *Medicine (Baltimore).* 2022;101(39):e30802. doi: 10.1097/MD.0000000000030802.

24. Waligora KJ, Bahouth MN, Han HR. The self-care needs and behaviors of dementia informal caregivers: A systematic review. *Gerontologist.* 2019;59(5):e565-e583. doi: 10.1093/geront/gny076.

25. Shi J, McCallion P, Ferretti LA. Understanding differences between caregivers and non-caregivers in completer rates of Chronic Disease Self-Management Program. *Public Health.* 2017;147:128-135. doi: 10.1016/j.puhe.2017.02.001.

26. Hendrix CC, Bailey DE, Jr., Steinhauser KE, et al. Effects of enhanced caregiver training program on cancer caregiver's self-efficacy, preparedness, and psychological well-being. *Support Care Cancer.* 2016;24(1):327-336. doi: 10.1007/s00520-015-2797-3.

27. AGREE Next Steps Consortium. The AGREE II Instrument. 2017; https://www.agreetrust.org/wp-content/uploads/2017/12/AGREE-II-Users-Manual-and-23-item-Instrument-2009-Update-2017.pdf. Accessed August 28, 2018.

28. Chen J, Zhang Y, Barandouzi ZA, et al. The effect of self-management online modules plus nurse-led support on pain and quality of life among young adults with irritable bowel syndrome: A randomized controlled trial. *Int J Nurs Stud.* 2022;132:104278. doi: 10.1016/j.ijnurstu.2022.104278.

29. Fanning J, Brooks AK, Hsieh KL, et al. The effects of a pain management-focused mobile health behavior intervention on older adults' self-efficacy, satisfaction with functioning, and quality of life: A randomized pilot trial. *Int J Behav Med.* 2022;29(2):240-246. doi: 10.1007/s12529-021-10003-3.

30. DeBar L, Mayhew M, Benes L, et al. A primary care-based cognitive behavioral therapy intervention for long-term opioid users with chronic pain : A randomized pragmatic trial. *Ann Intern Med.* 2022;175(1):46-55. doi: 10.7326/M21-1436.

31. Matthias MS, Bair MJ, Ofner S, et al. Peer support for self-management of chronic pain: The evaluation of a peer coach-led intervention to improve pain symptoms (eclipse) trial. *J Gen Intern Med.* 2020;35(12):3525-3533. doi: 10.1007/s11606-020-06007-6.

32. Andreae SJ, Andreae LJ, Richman JS, Cherrington AL, Safford MM. Peer-delivered cognitive behavioral training to improve functioning in patients with diabetes: A cluster-randomized trial. *Ann Fam Med.* 2020;18(1):15-23. doi: 10.1370/afm.2469.

33. Merlin JS, Westfall AO, Long D, et al. A randomized pilot trial of a novel behavioral intervention for chronic pain tailored to individuals with hiv. *AIDS Behav.* 2018;22(8):2733-2742. doi: 10.1007/s10461-018-2028-2.

34. Barone Gibbs B, Hergenroeder AL, Perdomo SJ, Kowalsky RJ, Delitto A, Jakicic JM. Reducing sedentary behaviour to decrease chronic low back pain: the stand back randomised trial. *Occup Environ Med.* 2018;75(5):321-327. doi: 10.1136/oemed-2017-104732.

35. Sullivan MD, Turner JA, DiLodovico C, D'Appollonio A, Stephens K, Chan YF. Prescription opioid taper support for outpatients with chronic pain: A randomized controlled trial. *J Pain.* 2017;18(3):308-318. doi: 10.1016/j.jpain.2016.11.003.

36. Waters SJ, Strauman TJ, McKee DC, et al. Self-system therapy for distress associated with persistent low back pain: A randomized clinical trial. *Psychother Res.* 2016;26(4):472-483. doi: 10.1080/10503307.2015.1040485.

37. Ehde DM, Elzea JL, Verrall AM, Gibbons LE, Smith AE, Amtmann D. Efficacy of a telephone-delivered self-management intervention for persons with multiple sclerosis: A randomized controlled trial with a one-year follow-up. *Arch Phys Med Rehabil.* 2015;96(11):1945-1958 e1942. doi: 10.1016/j.apmr.2015.07.015.

38. Shadick NA, Sowell NF, Frits ML, et al. A randomized controlled trial of an internal family systems-based psychotherapeutic intervention on outcomes in rheumatoid arthritis: a proof-of-concept study. *J Rheumatol.* 2013;40(11):1831-1841. doi: 10.3899/jrheum.121465.

39. Shigaki CL, Smarr KL, Siva C, Ge B, Musser D, Johnson R. RAHelp: an online intervention for individuals with rheumatoid arthritis. *Arthritis Care Res (Hoboken).* 2013;65(10):1573-1581. doi: 10.1002/acr.22042.

40. Conn DL, Pan Y, Easley KA, et al. The effect of the Arthritis Self-Management Program on outcome in African Americans with rheumatoid arthritis served by a public hospital. *Clin Rheumatol.* 2013;32(1):49-59. doi: 10.1007/s10067-012-2090-5.

41. Somers TJ, Blumenthal JA, Guilak F, et al. Pain coping skills training and lifestyle behavioral weight management in patients with knee osteoarthritis: a randomized controlled study. *Pain.* 2012;153(6):1199-1209. doi: 10.1016/j.pain.2012.02.023.

42. Allen KD, Somers TJ, Campbell LC, et al. Pain coping skills training for African Americans with osteoarthritis: results of a randomized controlled trial. *Pain.* 2019;160(6):1297-1307. doi: 10.1097/j.pain.0000000000001525.

43. Goode AP, Taylor SS, Hastings SN, Stanwyck C, Coffman CJ, Allen KD. Effects of a home-based telephone-supported physical activity program for older adult veterans with chronic low back pain. *Phys Ther.* 2018;98(5):369-380. doi: 10.1093/ptj/pzy026.

44. Focht BC, Garver MJ, Devor ST, et al. Group-mediated physical activity promotion and mobility in sedentary patients with knee osteoarthritis: results from the IMPACT-pilot trial. *J Rheumatol.* 2014;41(10):2068-2077. doi: 10.3899/jrheum.140054.

45. Thorn BE, Eyer JC, Van Dyke BP, et al. Literacy-adapted cognitive behavioral therapy versus education for chronic pain at low-income clinics: A randomized controlled trial. *Ann Intern Med.* 2018;168(7):471-480. doi: 10.7326/M17-0972.

46. Cong X, Ramesh D, Perry M, et al. Pain self-management plus nurse-led support in young adults with irritable bowel syndrome: Study protocol for a pilot randomized control trial. *Res Nurs Health.* 2018;41(2):121-130. doi: 10.1002/nur.21862.

47. Matthias MS, Daggy J, Adams J, et al. Evaluation of a peer coach-led intervention to improve pain symptoms (ECLIPSE): Rationale, study design, methods, and sample characteristics. *Contemp Clin Trials.* 2019;81:71-79. doi: 10.1016/j.cct.2019.04.002.

48. Focht BC, Garver MJ, Devor ST, et al. Improving maintenance of physical activity in older, knee osteoarthritis patients trial-pilot (IMPACT-P): design and methods. *Contemp Clin Trials.* 2012;33(5):976-982. doi: 10.1016/j.cct.2012.04.012.

49. Focht BC, Garver MJ, Lucas AR, et al. A group-mediated physical activity intervention in older knee osteoarthritis patients: effects on social cognitive outcomes. *J Behav Med.* 2017;40(3):530-537. doi: 10.1007/s10865-017-9822-6.

50. Andreae SJ, Andreae LJ, Cherrington AL, et al. Development of a community health worker-delivered cognitive behavioral training intervention for individuals with diabetes and chronic pain. *Fam Community Health.* 2018;41(3):178-184. doi: 10.1097/FCH.0000000000000197.

51. Andreae SJ, Andreae LJ, Richman JS, Cherrington AL, Safford MM. Peer-delivered cognitive behavioral therapy-based intervention reduced depression and stress in community dwelling

adults with diabetes and chronic pain: a cluster randomized trial. *Ann Behav Med.* 2021;55(10):970-980. doi: 10.1093/abm/kaab034.

52. Khodneva Y, Richman J, Andreae S, Cherrington A, Safford MM. Peer Support Intervention Improves Pain-Related Outcomes Among Rural Adults With Diabetes and Chronic Pain at 12-Month Follow-Up. *J Rural Health.* 2021;37(2):394-405. doi: 10.1111/jrh.12422.

53. Fanning J, Brooks AK, Ip E, Nicklas BJ, Rejeski WJ. A mobile health intervention to reduce pain and improve health (MORPH) in older adults with obesity: protocol for the MORPH trial. *JMIR Res Protoc.* 2018;7(5):e128. doi: 10.2196/resprot.9712.

54. Fanning J, Brooks AK, Ip E, et al. A mobile health behavior intervention to reduce pain and improve health in older adults with obesity and chronic pain: the MORPH pilot trial. *Front Digit Health.* 2020;2. doi: 10.3389/fdgth.2020.598456.

55. DeBar L, Benes L, Bonifay A, et al. Interdisciplinary team-based care for patients with chronic pain on long-term opioid treatment in primary care (PPACT) - Protocol for a pragmatic cluster randomized trial. *Contemp Clin Trials.* 2018;67:91-99. doi: 10.1016/j.cct.2018.02.015.

56. Schrubbe LA, Ravyts SG, Benas BC, et al. Pain coping skills training for African Americans with osteoarthritis (STAART): study protocol of a randomized controlled trial. *BMC Musculoskelet Disord.* 2016;17(1):359. doi: 10.1186/s12891-016-1217-2.

57. Ehde DM, Arewasikporn A, Alschuler KN, Hughes AJ, Turner AP. Moderators of Treatment Outcomes After Telehealth Self-Management and Education in Adults With Multiple Sclerosis: A Secondary Analysis of a Randomized Controlled Trial. *Arch Phys Med Rehabil.* 2018;99(7):1265-1272. doi: 10.1016/j.apmr.2017.12.012.

58. Knowles LM, Arewasikporn A, Kratz AL, Turner AP, Alschuler KN, Ehde DM. Early Treatment Improvements in Depression Are Associated With Overall Improvements in Fatigue Impact and Pain Interference in Adults With Multiple Sclerosis. *Ann Behav Med.* 2021;55(9):833-843. doi: 10.1093/abm/kaaa102.

59. Clement ND, Bardgett M, Weir D, Holland J, Gerrand C, Deehan DJ. What is the minimum clinically important difference for the womac index after tka? *Clin Orthop Relat Res.* 2018;476(10):2005-2014. doi: 10.1097/CORR.0000000000000444.

60. Jordan K, Dunn KM, Lewis M, Croft P. A minimal clinically important difference was derived for the Roland-Morris Disability Questionnaire for low back pain. *J Clin Epidemiol.* 2006;59(1):45-52. doi: 10.1016/j.jclinepi.2005.03.018.

61. Abel JL, Carson RT, Andrae DA. The impact of treatment with eluxadoline on health-related quality of life among adult patients with irritable bowel syndrome with diarrhea. *Qual Life Res.* 2019;28(2):369-377. doi: 10.1007/s11136-018-2008-z.

62. Strand LI, Ljunggren AE, Bogen B, Ask T, Johnsen TB. The Short-Form McGill Pain Questionnaire as an outcome measure: test-retest reliability and responsiveness to change. *Eur J Pain.* 2008;12(7):917-925. doi: 10.1016/j.ejpain.2007.12.013.

63. Masson SC, Tejani AM. Minimum clinically important differences identified for commonly used depression rating scales. *J Clin Epidemiol.* 2013;66(7):805-807. doi: 10.1016/j.jclinepi.2013.01.010.

64. Banerjee A, Hendrick P, Bhattacharjee P, Blake H. A systematic review of outcome measures utilised to assess self-management in clinical trials in patients with chronic pain. *Patient Educ Couns.* 2018;101(5):767-778. doi: 10.1016/j.pec.2017.12.002.

65. Brady TJ. Measures of self-efficacy: Arthritis Self-Efficacy Scale (ASES), Arthritis Self-Efficacy Scale-8 Item (ASES-8), Children's Arthritis Self-Efficacy Scale (CASE), Chronic Disease Self-Efficacy Scale (CDSES), Parent's Arthritis Self-Efficacy Scale (PASE), and Rheumatoid Arthritis Self-Efficacy Scale (RASE). *Arthritis Care Res (Hoboken).* 2011;63 Suppl 11(S11):S473-485. doi: 10.1002/acr.20567.

66. Lorig K, Chastain RL, Ung E, Shoor S, Holman HR. Development and evaluation of a scale to measure perceived self-efficacy in people with arthritis. *Arthritis Rheum.* 1989;32(1):37-44. doi: 10.1002/anr.1780320107.

67. ClinicalTrials.gov. A randomized controlled trial of a community-based chronic pain self-management program in West Virginia (NCT03582683). 2021; https://clinicaltrials.gov/study/NCT03582683. Accessed October 8, 2023.

68. ClinicalTrials.gov. Efficacy of a telehealth pain self-management intervention in employed adults with physical disability: A randomized controlled trial (NCT04248725). 2022; https://clinicaltrials.gov/study/NCT04248725. Accessed October 8, 2023.

69. ClinicalTrials.gov. Randomized trial of telephonic pain self-management to promote opioid tapering (NCT03743402). 2023; https://clinicaltrials.gov/study/NCT03743402. Accessed October 8, 2023.

70. ClinicalTrials.gov. A randomized clinical trial to evaluate non-pharmacologic and pharmacologic approaches for reducing pain and opioid use among patients treated with maintenance hemodialysis (NCT04571619). 2023; https://clinicaltrials.gov/study/NCT04571619. Accessed October 8, 2023.

71. ClinicalTrials.gov. Efficacy of a culturally adapted cognitive behavioral based physical therapy intervention for Latinos with chronic spine pain (NCT05005416). 2023; https://clinicaltrials.gov/study/NCT05005416. Accessed October 8, 2023.

72. ClinicalTrials.gov. Treating chronic pain in buprenorphine patients in primary care settings (NCT03698669). 2023; https://clinicaltrials.gov/study/NCT03698669. Accessed October 8, 2023.

73. ClinicalTrials.gov. A brief, transdiagnostic cognitive behavioral treatment for urological chronic pelvic pain syndrome: processes, predictions, outcomes (NCT05127616). 2023; https://clinicaltrials.gov/study/NCT05127616. Accessed October 8, 2023.

74. ClinicalTrials.gov. Integrated telehealth intervention to reduce chronic pain and unhealthy drinking among people living with HIV (NCT05503173). 2023; https://clinicaltrials.gov/study/NCT05503173. Accessed October 8, 2023.

75. ClinicalTrials.gov. Randomized trial of acceptance and commitment therapy (ACT) and a care management app in primary care-based buprenorphine treatment (NCT05039554). 2023; https://clinicaltrials.gov/study/NCT05039554. Accessed October 8, 2023.

76. Kolasinski SL, Neogi T, Hochberg MC, et al. 2019 American College of Rheumatology/Arthritis Foundation Guideline for the management of osteoarthritis of the hand, hip, and knee. *Arthritis Rheumatol.* 2020;72(2):220-233. doi: 10.1002/art.41142.

77. Pangarkar SS, Kang DG, Sandbrink F, et al. VA/DoD clinical practice guideline: diagnosis and treatment of low back pain. *J Gen Intern Med.* 2019;34(11):2620-2629. doi: 10.1007/s11606-019-05086-4.

78. England BR, Smith BJ, Baker NA, et al. 2022 American College of Rheumatology guideline for exercise, rehabilitation, diet, and additional integrative interventions for rheumatoid arthritis. *Arthritis Rheumatol.* 2023;75(8):1299-1311. doi: 10.1002/art.42507.

79. National Institute for Health and Care Excellence. Chronic pain (primary and secondary) in over 16s: assessment of all chronic pain and management of chronic primary pain (NG193). NICE; 2021; https://www.nice.org.uk/guidance/ng193. Accessed June 16, 2023.

80. Bannuru RR, Osani MC, Vaysbrot EE, et al. OARSI guidelines for the non-surgical management of knee, hip, and polyarticular osteoarthritis. *Osteoarthritis Cartilage.* 2019;27(11):1578-1589. doi: 10.1016/j.joca.2019.06.011.

81. Nikiphorou E, Santos EJF, Marques A, et al. 2021 EULAR recommendations for the implementation of self-management strategies in patients with inflammatory arthritis. *Ann Rheum Dis.* 2021;80(10):1278-1285. doi: 10.1136/annrheumdis-2021-220249.

82. Nagy G, Roodenrijs NMT, Welsing PMJ, et al. EULAR points to consider for the management of difficult-to-treat rheumatoid arthritis. *Ann Rheum Dis.* 2022;81(1):20-33. doi: 10.1136/annrheumdis-2021-220973.

83. U.S. Department of Health and Human Services. Pain management best practices inter-agency task force report: updates, gaps, inconsistencies, and recommendations. 2019; https://www.hhs.gov/opioids/prevention/pain-management-options/index.html. Accessed June 19, 2023.

84. National Institute for Health and Care Excellence. Rheumatoid arthritis in adults: management (NG100). 2020; https://www.nice.org.uk/guidance/ng100/resources/rheumatoid-arthritis-in-adults-management-pdf-66141531233989. Accessed September 4, 2023.

85. National Institute for Health and Care Excellence. Low back pain and sciatica in over 16s: assessment and management (NG59). 2020; https://www.nice.org.uk/guidance/ng59/resources/low-back-pain-and-sciatica-in-over-16s-assessment-and-management-pdf-1837521693637. Accessed September 4, 2023.

86. National Institute for Health and Care Excellence. Osteoarthritis in over 16s: diagnosis and management (NG226). 2023; https://www.nice.org.uk/guidance/ng226/resources/osteoarthritis-in-over-16s-diagnosis-and-management-pdf-66143839026373. Accessed September 4, 2023.

87. National Institute for Health and Care Excellence. Endometriosis: diagnosis and management (NG73). 2017; https://www.nice.org.uk/guidance/ng73/resources/endometriosis-diagnosis-and-management-pdf-1837632548293. Accessed September 4, 2023.

88. National Institute for Health and Care Excellence. Headaches in over 12s: diagnosis and management (CG150). 2021; https://www.nice.org.uk/guidance/cg150/resources/headaches-in-over-12s-diagnosis-and-management-pdf-35109624582853. Accessed September 4, 2023.

89. National Institute for Health and Care Excellence. Irritable bowel syndrome in adults: diagnosis and management (CG61). 2017; https://www.nice.org.uk/guidance/cg61/resources/irritable-bowel-syndrome-in-adults-diagnosis-and-management-pdf-975562917829. Accessed September 4, 2023.

90. National Institute for Health and Care Excellence. Neuropathic pain in adults: pharmacological management in nonspecialist settings (CG173). 2020; https://www.nice.org.uk/guidance/cg173/resources/neuropathic-pain-in-adults-pharmacological-management-in-nonspecialist-settings-pdf-35109750554053. Accessed September 4, 2023.

91. National Institute for Health and Care Excellence. Spondyloarthritis in over 16s: diagnosis and management (NG65). 2017; https://www.nice.org.uk/guidance/ng65/resources/spondyloarthritis-in-over-16s-diagnosis-and-management-pdf-1837575441349. Accessed September 4, 2023.

92. Zangi HA, Ndosi M, Adams J, et al. EULAR recommendations for patient education for people with inflammatory arthritis. *Ann Rheum Dis.* 2015;74(6):954-962. doi: 10.1136/annrheumdis-2014-206807.

93. Roodenrijs NMT, Hamar A, Kedves M, et al. Pharmacological and non-pharmacological therapeutic strategies in difficult-to-treat rheumatoid arthritis: a systematic literature review informing the EULAR recommendations for the management of difficult-to-treat rheumatoid arthritis. *RMD Open.* 2021;7(1). doi: 10.1136/rmdopen-2020-001512.

94. Centers for Medicare & Medicaid Services. Subpart H - outpatient diabetes self-management training and diabetes outcome measurements. 2023; https://www.ecfr.gov/current/title-42/chapter-IV/subchapter-B/part-410/subpart-H. Accessed April 18, 2023.

95. Washington Apple Health (Medicaid). Diabetes education program billing guide. 2020; https://www.hca.wa.gov/assets/billers-and-providers/diabetes-education-bi-20200101.pdf. Accessed August 30, 2023.

96. Cigna. Cigna medical coverage policy 0413: diabetes self-management education. 2014; https://www.aapc.com/codes/webroot/upload/general_pages_docs/document/mm_0413_coverageposition criteria_diabetes_self_management_education.pdf. Accessed August 30, 2023.

97. Regence BlueCross BlueShield of Oregon. Regence BlueCross BlueShield of Oregon policy. 2021; https://apis.regence.com/v1/publicdocuments/sales/individual/productId/WMO22200/docType/OM/pdf/Silver3500EPOPeaceHealth?brand=blu. Accessed August 30, 2023.

98. Cigna. Your health first: a holistic approach to chronic diseases. 2015; http://www.meuhp.com/media/13015/yhf%20flyer%20(1).pdf. Accessed August 30, 2023.

99. Regence. Regence and The Portland Clinic partner to support pain management education. 2019; https://news.regence.com/blog/regence-and-the-portland-clinic-partner-to-support-pain-management-education. Accessed August 21, 2023.

100. Aetna. Outpatient medical self-care programs: clinical policy bulletin 0169. 2023; https://www.aetna.com/cpb/medical/data/100_199/0169.html. Accessed August 30, 2023.

101. Moda. Disease management for pain (pain schools). 2022; https://www.modahealth.com/pdfs/med_criteria/Disease_Management_Program_for_Pain.pdf. Accessed August 21, 2023.

102. Brouwers MC, Kho ME, Browman GP, et al. Development of the AGREE II, part 2: assessment of validity of items and tools to support application. *CMAJ.* 2010;182(10):E472-478. doi: 10.1503/cmaj.091716.

103. Brouwers MC, Kho ME, Browman GP, et al. AGREE II: advancing guideline development, reporting and evaluation in health care. *CMAJ.* 2010;182(18):E839-842. doi: 10.1503/cmaj.090449.

APPENDIX A. GRADE TABLE ELEMENT DESCRIPTIONS

TABLE A1. GRADE TABLE ELEMENTS

ELEMENT	DESCRIPTION
Balance of benefits and harms	The larger the difference between the desirable and undesirable effects, the higher the likelihood that a strong recommendation is warranted. An estimate that is not statistically significant or has a confidence interval crossing a predetermined clinical decision threshold will be downgraded.
Quality of evidence	The higher the quality of evidence, the higher the likelihood that a strong recommendation is warranted.
Resource allocation	The higher the costs of an intervention—that is, the greater the resources consumed in the absence of likely cost offsets—the lower the likelihood that a strong recommendation is warranted.
Values and preferences	The more values and preferences vary, or the greater the uncertainty in values and preferences, the higher the likelihood that a weak recommendation is warranted.
Other considerations	Other considerations include issues about the implementation and operationalization of the technology or intervention in health systems and practices within Oregon.

Abbreviation. GRADE: Grading of Recommendations, Assessment, Development, and Evaluations approach.

Confidence in Estimate Rating Across Studies for the Intervention and Outcome

Assessment of confidence in estimate includes factors such as risk of bias, precision, directness, consistency, and publication bias.

High: The subcommittee is very confident that the true effect lies close to that of the estimate of the effect. Typical sets of studies are randomized controlled trials (RCTs) with few or no limitations, and the estimate of effect is likely stable.

Moderate: The subcommittee is moderately confident in the estimate of effect: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different. Typical sets of studies are RCTs with some limitations or well-performed nonrandomized studies with additional strengths that guard against potential bias and have large estimates of effects.

Low: The subcommittee's confidence in the estimate of effect is limited: The true effect may be substantially different from the estimate of the effect. Typical sets of studies are RCTs with serious limitations or nonrandomized studies without special strengths.

Very low: The subcommittee has very little confidence in the estimate of effect: The true effect is likely to be substantially different from the estimate of effect. Typical sets of studies are nonrandomized studies with serious limitations or inconsistent results across studies.

APPENDIX B. GRADE EVIDENCE PROFILES

TABLE B1. CERTAINTY ASSESSMENT (CONFIDENCE IN ESTIMATE OF EFFECT) FOR SMP IN CHRONIC PAIN POPULATIONS

NO. OF STUDIES SAMPLE SIZE	RISK OF BIAS	INCONSISTENCY	INDIRECTNESS	IMPRECISION	OTHER FACTORS	LEVEL OF CONFIDENCE
HRQoL: OVERALL						
13 RCTs N = 2,225	**Serious** Majority of studies have moderate to high ratings due to substantial study attrition and insufficient blinding and group allocation procedures	**Serious** Mixed outcome effects across studies	**Serious** Multiple scales used to measure outcomes (including some composite measures), wide variation in intervention design	**Not serious**	In several studies, intervention group participants did not receive a minimum "dose" of SMP	**Very low** ●○○○
HRQoL: PAIN						
14 RCTs N = 2,734	**Serious** Majority of studies have moderate to high ratings due to substantial study attrition and insufficient blinding and group allocation procedures	**Serious** Mixed outcome effects across studies	**Serious** Multiple scales used to measure outcomes (including some composite measures), wide variation in intervention design	**Not serious**	In several studies, intervention group participants did not receive a minimum "dose" of SMP	**Very low** ●○○○
DEPRESSION						
10 RCTs N = 1,556	**Serious** Majority of studies have moderate to high ratings due to substantial study attrition and insufficient blinding and group allocation procedures	**Serious** Mixed outcome effects across studies	**Serious** Multiple scales used to measure depression outcomes; wide variation in intervention design	**Not serious**	In 2 studies, the majority of the intervention group participants did not receive a minimum "dose" of SMP	**Very low** ●○○○

NO. OF STUDIES SAMPLE SIZE	RISK OF BIAS	INCONSISTENCY	INDIRECTNESS	IMPRECISION	OTHER FACTORS	LEVEL OF CONFIDENCE
SELF-EFFICACY						
13 RCTs N = 1,599	**Serious** Majority of studies have moderate to high ratings due to substantial study attrition and insufficient blinding and group allocation procedures	**Serious** Mixed outcome effects across studies	**Serious** Multiple outcomes scales used to measure self-efficacy; wide variation in intervention design	**Not serious**	In 2 studies, the majority of the intervention group participants did not receive a minimum "dose" of SMP	**Very low** ●○○○
MEDICATION USE						
3 RCTs N = 1,098	**Moderate** Two of 3 included studies were rated as moderate due to blinding issues and loss to follow-up, but largest study with most outcomes was rated as low	**Not serious** Majority of effects aligned across studies with slight inconsistency on 2 measures between study timepoints	**Serious** Some overlap in outcomes measurement, but substantial variation in intervention design	**Moderate** 1 study was very small and had limited statistical power	**Not serious** Studies were largely conducted in mixed chronic pain populations with long-term pain medication use; likely fairly generalizable	**Low** ●●○○
HEALTH RESOURCE USE						
1 RCT N = 215	**Serious** Substantial loss to follow-up and differential attrition	**Not assessable**	**Serious** Data limited to a mostly male military population with musculoskeletal pain only, recruited at a single site	**Not serious**	**Serious** Among participants not lost to follow-up adherence to intervention and control activities was very low	**Very low** ●○○○

Abbreviations. HRQoL: health-related quality of life; RCT: randomized controlled trial; SMP: self-management program

APPENDIX C. METHODS

Scope Statement

Populations

Adults with chronic pain (generally defined as pain lasting > 3 months), including those with arthritis

Interventions

Chronic disease self-management programs (SMPs) that:

- Are offered in synchronous or asynchronous formats
- Target behavior modification through iterative feedback between participants and facilitators (defined as 2 or more points of contact where skill-building occurs)
- Address multiple components of self-management (e.g., goal setting, communication with providers)
- Use standardized curricula
- Are delivered by clinicians, community workers, or peers who have been formally trained to administer the SMP

Comparators

- Usual care
- Wait-list
- Education only
- Active controls for multicomponent interventions (e.g., SMP plus physical activity vs. physical activity alone)

Outcomes

Critical: health-related quality of life (overall and pain intensity)

Important: depression, self-efficacy, change in medication use, health resource use

Considered, but not selected for GRADE table: increased physical activity, patient activation, cost or cost-effectiveness

Study Designs

RCTs conducted in the US

Follow-up

12 weeks or greater

Settings

- Outpatient
- Community settings
- Institutional settings (e.g., nursing homes and assisted living, group homes, and correctional facilities)

Key Questions

KQ1. What is the effectiveness of SMPs compared to usual care?

KQ2. How does the effectiveness of SMPs vary by:

- a. Intervention characteristics
- b. Patient characteristics
  - i. Place of residence
  - ii. Race, ethnicity, culture, or language
  - iii. Occupation
  - iv. Gender or sex
  - v. Age
  - vi. Religion
  - vii. Education
  - viii. Socioeconomic status
  - ix. Social capital

Contextual Questions

CQ1. What is the cost-effectiveness of SMPs?

CQ2. What is the impact of SMPs on caregiver support?

Key Question Search Strategy

We searched bibliographic databases to identify randomized controlled trials (RCTs) and systematic reviews including the terms *chronic pain, arthritis, self-management,* and *self-efficacy*. We limited records retrieved to those studies focused on human subjects and published in the English language after 2011. No additional search limits were applied. Systematic reviews were used for reference list searching and not as evidence sources. Searches were conducted from April 4, 2023 to May 3, 2023.

Bibliographic Databases

TABLE C1. BIBLIOGRAPHIC DATABASES SEARCHED FOR THIS REPORT

DATABASE	PLATFORM	ISSUE/VERSION	TOTAL NUMBER OF RECORDS RETRIEVED
CENTRAL	Wiley	May 2021	1,660
MEDLINE ALL	Ovid	1946 to May 02, 2023	2,375
CINAHL		May 03, 2023	776
APA PsycINFO		1806 to April Week 4 2023	956

Abbreviations. APA: American Psychological Association; CDSR: CENTRAL: Cochrane Central Register of Controlled Trials; CINAHL: Cumulative Index to Nursing and Allied Health Literature.

CENTRAL via the Cochrane Library Search Strategy

#1	MeSH descriptor: [Arthritis] explode all trees	20859
#2	MeSH descriptor: [Fibromyalgia] this term only	1956

#3 MeSH descriptor: [Chronic Pain] this term only 4125

#4 (chronic or hard-to-treat or difficult-to-treat or intractable or long-term or long term or persist* or non-acute) NEAR/3 (pain* or headache* or arthriti* or osteoarthriti* or fibromyalgi*) 29696

#5 #1 or #2 or #3 or #4 50392

#6 (self-paced or self-manag* or self-efficacy or self-care or self-evaluation or self-guided or self-administer* or self-help or patient-guided) NEAR/5 (program* or treatment* or therap* or intervention* or training or educat* or internet* or online* or application* or web* or smartphone* or phone* or sms* or iphone* or video* or workbook* or mobile* or tablet* or ipad* or virtual* or digital* or e-learning or email* or app or apps or telephone) 22282

#7 [mh ^"Self Care"] or [mh ^"Self Efficacy"] or [mh ^"Self-Management"]9648

#8 self NEAR/3 (paced or pacing or manag* or efficacy or care or evaluat* or guid* or help*) NEAR/5 (program* or treatment* or therap* or intervention* or training or educat* or internet* or online* or application* or web* or smartphone* or phone* or sms* or iphone* or video* or workbook* or mobile* or tablet* or ipad* or virtual* or digital* or e-learning or email* or app or apps or telephone) 22223

#9 #6 or #7 or #8 26341

#10 #5 and #9 1660

Ovid MEDLINE ALL Search Strategy

1. exp Arthritis/ 294276
2. Fibromyalgia/ 9812
3. Chronic Pain/ 22035
4. ((chronic or hard-to-treat or difficult-to-treat or intractable or long-term or long term or persist* or non-acute) adj3 (pain* or headache* or arthriti* or osteoarthriti* or fibromyalgi*)).ti,ab,kf. 117073
5. or/1-4 409913
6. *Self Care/ or *Self Efficacy/ or *Self-Management/ 32876
7. ((self-paced or self-manag* or self-efficacy or self-care or self-evaluation or self-guided or self-administer* or self-help or patient-guided) adj5 (program* or treatment* or therap* or intervention* or training or educat* or internet* or online* or application* or web* or smartphone* or phone* or sms* or iphone* or video* or workbook* or mobile* or tablet* or ipad* or virtual* or digital* or e-learning or email* or app or apps or telephone)).ti,ab,kf. 30468
8. (self adj3 (paced or pacing or manag* or efficacy or care or evaluat* or guid* or help*)).ti,ab,kf. 118957
9. (program* or treatment* or therap* or intervention* or training or educat* or internet* or online* or application* or web* or smartphone* or phone* or sms* or iphone* or video* or workbook* or mobile* or tablet* or ipad* or virtual* or digital* or e-learning or email* or app or apps or telephone).ti,ab,kf. 11171160

10. (self adj3 (paced or pacing or manag* or efficacy or care or evaluat* or guid* or help*) adj5 (program* or treatment* or therap* or intervention* or training or educat* or internet* or online* or application* or web* or smartphone* or phone* or sms* or iphone* or video* or workbook* or mobile* or tablet* or ipad* or virtual* or digital* or e-learning or email* or app or apps or telephone)).ti,ab,kf. 28211
11. or/6-7,10 56257
12. 5 and 11 2463
13. limit 12 to english language 2375

CINAHL Search Strategy

TABLE C2. CINAHL SEARCH STRATEGY FOR THIS REPORT

#	QUERY	LIMITERS/EXPANDERS	LAST RUN VIA	RESULTS
S1	(MM "Chronic Pain")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	19,783
S2	(MM "Fibromyalgia")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	4,934
S3	(MM "Arthritis+")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	69,416
S4	TI (((chronic or hard-to-treat or difficult-to-treat or intractable or long-term or long term or persist* or non-acute) N3 (pain* or headache* or arthriti* or osteoarthriti* or fibromyalgi*))) OR AB (((chronic or hard-to-treat or difficult-to-treat or intractable or long-term or long term or persist* or non-acute) N3 (pain* or headache* or arthriti* or osteoarthriti* or fibromyalgi*)))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	52,924
S5	S1 OR S2 OR S3 OR S4	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search	129,599

#	QUERY	LIMITERS/EXPANDERS	LAST RUN VIA	RESULTS
			Database - CINAHL Plus with Full Text	
S6	(MM "Self Care") OR (MM "Self-Management")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	24,524
S7	(MM "Self-Efficacy")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	10,259
S8	TI (((self-paced or self-manag* or self-efficacy or self-care or self-evaluation or self-guided or self-administer* or self-help or patient-guided) N5 (program* or treatment* or therap* or intervention* or training or educat* or internet* or online* or application* or web* or smartphone* or phone* or sms* or iphone* or video* or workbook* or mobile* or tablet* or ipad* or virtual* or digital* or e-learning or email* or app or apps or telephone))) OR AB (((self-paced or self-manag* or self-efficacy or self-care or self-evaluation or self-guided or self-administer* or self-help or patient-guided) N5 (program* or treatment* or therap* or intervention* or training or educat* or internet* or online* or application* or web* or smartphone* or phone* or sms* or iphone* or video* or workbook* or mobile* or tablet* or ipad* or virtual* or digital* or e-learning or email* or app or apps or telephone)))	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	22,262
S9	TI ((self N3 (paced or pacing or manag* or efficacy or care or evaluat* or guid* or help*) N5 (program* or treatment* or therap* or intervention* or training or educat* or internet* or online* or application* or web* or smartphone* or phone* or sms* or iphone* or video* or workbook* or mobile* or tablet* or ipad* or virtual* or digital* or e-learning or email* or app or apps or telephone))) OR AB ((self N3 (paced or pacing or manag* or efficacy	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	22,322

#	QUERY	LIMITERS/EXPANDERS	LAST RUN VIA	RESULTS
	or care or evaluat* or guid* or help*) N5 (program* or treatment* or therap* or intervention* or training or educat* or internet* or online* or application* or web* or smartphone* or phone* or sms* or iphone* or video* or workbook* or mobile* or tablet* or ipad* or virtual* or digital* or e-learning or email* or app or apps or telephone)))			
S10	S6 OR S7 OR S8 OR S9	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	49,409
S11	S5 AND S10	Limiters - English Language; Peer Reviewed; Exclude MEDLINE records; Language: English Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus with Full Text	776

PsycINFO Search Strategy

1. exp Arthritis/ 4722
2. Fibromyalgia/ 2339
3. Chronic Pain/ 15805
4. ((chronic or hard-to-treat or difficult-to-treat or intractable or long-term or long term or persist* or non-acute) adj3 (pain* or headache* or arthriti* or osteoarthriti* or fibromyalgi*)).ti,ab,id. 29179
5. or/1-4 35310
6. Self-Help Techniques/ or Self-Management/ or Self-Instructional Training/ or Self-Efficacy/ 40511
7. ((self-paced or self-manag* or self-efficacy or self-care or self-evaluation or self-guided or self-administer* or self-help or patient-guided) adj5 (program* or treatment* or therap* or intervention* or training or educat* or internet* or online* or application* or web* or smartphone* or phone* or sms* or iphone* or video* or workbook* or mobile* or tablet* or ipad* or virtual* or digital* or e-learning or email* or app or apps or telephone)).ti,ab,id. 20797
8. (self adj3 (paced or pacing or manag* or efficacy or care or evaluat* or guid* or help*) adj5 (program* or treatment* or therap* or intervention* or training or educat* or internet* or online* or application* or web* or smartphone* or phone* or sms* or iphone* or video* or workbook* or mobile* or tablet* or ipad* or virtual* or digital* or e-learning or email* or app or apps or telephone)).ti,ab,id. 21255
9. or/6-8 52780

10. 5 and 9 1189
11. limit 10 to english language 1146
12. limit 11 to ("0120 non-peer-reviewed journal" or "0200 book" or "0280 edited book" or "0400 dissertation abstract") 190
13. 11 not 12 956

Ongoing Studies Search Strategy

We searched the following sources for ongoing studies conducted in the US using the search terms *self-management program, adults,* and *chronic pain*:

- ClinicalTrials.gov

Policy Landscape Methods

For the Policy Landscape section, we conducted targeted searches in Ovid MEDLINE, websites of relevant professional societies and guideline groups, and DuckDuckGo to identify relevant clinical practice guideline and key payer policies. Two reviewers independently assessed the quality of the included clinical practice guidelines using a modified version of the AGREE tool[27,102,103]; disagreements were resolved through consensus or by a third reviewer.

We limited searches for clinical practice guidelines to those published since 2018. We conducted a search for relevant clinical practice guidelines using MEDLINE and the following sources:

- American College of Rheumatology (ACR)
- Arthritis Foundation
- Canadian Agency for Drugs and Technologies in Health (CADTH)
- Centers for Disease Control and Prevention (CDC)
- Arthritis Foundation
- European Alliance of Associations for Rheumatology (EULAR)
- Health Quality Ontario
- National Institute for Health and Care Excellence (NICE)
- Osteoarthritis Research Society International (OARSI)
- Scottish Intercollegiate Guidelines Network (SIGN)
- United States Preventive Services Task Force (USPSTF)
- Veterans Administration/Department of Defense (VA/DoD) Clinical Practice Guidelines

We additionally sought payer coverage policies from select public and commercial payers, including:

- Medicare
- Washington State Medicaid
- Aetna
- Cigna
- Moda
- Regence BlueCross BlueShield of Oregon

Risk of Bias of Included Studies

We assessed the risk of bias of the included randomized controlled trials and clinical practice guidelines using standard instruments developed and adapted by the Center for Evidence-based Policy, which are modifications of instruments used by several renowned, respected organizations. Two experienced researchers independently rated all included studies. In cases in which there was disagreement about the risk of bias of a study, a third rater resolved the disagreement.

Randomized Controlled Trials

Low-risk-of-bias randomized controlled trials include a clear description of the population, setting, intervention, and comparison groups; a random and concealed allocation of patients to study groups; low dropout rates; and intention-to-treat analyses. Low-risk-of-bias randomized controlled trials also have low potential for bias from conflicts of interest and funding source(s). Moderate-risk-of-bias randomized controlled trials have incomplete information about methods that might mask important limitations or a meaningful conflict of interest. High-risk-of-bias randomized controlled trials have clear flaws that could introduce significant bias.

Clinical Practice Guidelines

We assessed the methodological quality of the guidelines using an instrument adapted from the Appraisal of Guidelines Research and Evaluation (AGREE) Collaboration.[27,102,103] Each rater assigned the study a rating of good, fair, or poor based on its adherence to recommended methods and potential for biases. A good-quality guideline fulfills all or most of the criteria outlined in the instrument. A fair-quality guideline fulfills some of the criteria, and its unfulfilled criteria are not likely to alter the recommendations. A poor-quality guideline met few or none of the criteria.

APPENDIX D. ADDITIONAL EVIDENCE TABLES

TABLE D1. STUDY DESIGN AND PARTICIPANT CHARACTERISTICS FOR INCLUDED RCTs ON SELF-MANAGEMENT PROGRAMS FOR CHRONIC PAIN IN ADULTS

AUTHOR, YEAR TRIAL NAME RISK OF BIAS	TOTAL N FOLLOW-UP	POPULATION DESCRIPTION	STUDY GROUP	GROUP N	MEAN AGE	MEAN PAIN DURATION	% FEMALE	% NON-WHITE
ALL-CAUSE CHRONIC PAIN								
DeBar, 2022[30] PPACT Low	N = 850 52 weeks	Adults with chronic pain receiving long-term opioid therapy	SMP	N = 433	61.4 years	NR	66.3%	22.9%
			Usual care	N = 417	59.2 years	NR	68.6%	23.9%
Fanning, 2022[29] MORPH High	N = 28 12 weeks	Older adults with chronic multisite pain and BMI of 30 to 45 kg/m^2	SMP + PA	N = 15	70.1 years	NR	86.7%	20%
			Wait-list	N = 13	70.3 years	NR	69.2%	15.4%
Sullivan, 2017[35] Moderate	N = 35 34 weeks	Adults with chronic pain receiving long-term opioid therapy	SMP	N = 18	54.4 years (overall cohort)	13.8 years (overall cohort)	66.7%	27.8%
			Usual care	N = 17			76.5%	5.6%
Thorn, 2018[45] LAMP High	N = 290 24 weeks	Adults (aged 19 to 71 years) with mixed chronic pain	SMP	N = 95	52.2 years	15.0 years	67%	75%
			Education	N = 97	49.9 years	16.7 years	69%	59%
			Usual care	N = 98	49.7 years	18.1 years	67%	69%
LOW BACK PAIN								
Barone Gibbs, 2018[34] Stand Back Moderate	N = 27 28 weeks	Adults with LBP in office jobs	SMP + PA	N = 13	52 years	NR	85%	23%
			Usual care	N = 14	51 years	NR	71%	14%
Goode, 2018[43] PACe-LBP Moderate	N = 60 12 weeks	Older adults with chronic LBP	SMP + PA	N = 20	69.5 years	> 5 years: 85%	10%	55%
			Exercise	N = 20	69.6 years	> 5 years: 85%	5%	60%
			Wait-list	N = 20	71.9 years	> 5 years: 80%	5%	40%

AUTHOR, YEAR TRIAL NAME RISK OF BIAS	TOTAL N FOLLOW-UP	POPULATION DESCRIPTION	STUDY GROUP	GROUP N	MEAN AGE	MEAN PAIN DURATION	% FEMALE	% NON-WHITE
Waters, 2016[36] High	N = 110 24 weeks	Patients with persistent LBP and major depressive disorder	SMP	N = 28	53.1 years	14.2 years	64.3%	28.6%
			Education	N = 37	54.6 years	8.5 years	70.3%	43.2%
			Usual care	N = 36	53.6 years	8.8 years	75%	33.3%
OSTEOARTHRITIS								
Allen, 2019[42] STAART Low	N = 248 36 weeks	Black or African American adults with knee or hip OA	SMP	N = 124	59.2 years	12.4 years	49.2%	100%
			Wait-list	N = 124	58.9 years	13.6 years	49.2%	100%
Focht, 2014[44] IMPACT-P Low	N = 80 52 weeks	Older adults with knee OA and functional impairment	SMP + PA	N = 40	63.4 years	NR	90%	27%
			Exercise	N = 40	63.6 years	NR	77%	34%
Somers, 2012[41] OA Life Moderate	N = 232 104 weeks	Adults with knee OA and BMI ≥ 25	SMP	N = 60	58.1 years	NR	67%	38%
			SMP + WM	N = 62	57.5 years	NR	92%	40%
			WM only	N = 59	58.3 years	NR	80%	34%
			Usual care	N = 51	57.9 years	NR	78%	39%
RHEUMATOID ARTHRITIS								
Conn, 2013[40] Moderate	N = 104 72 weeks	Low-income African American adults with RA	SMP	N = 52	54.2 years	9.1 years*	78.8%	94.2%
			Usual care	N = 52	52.9 years	6.4 years*	78.8%	96.2%
Shadick, 2013[38] Moderate	N = 79 84 weeks	Adults with RA	SMP	N = 39	57.8 years	18.9 years	92.3%	10.3%
			Education	N = 40	58.5 years	13.9 years	87.5%	5%
Shigaki, 2013[39] RAHelp Moderate	N = 108 36 weeks	Adults with RA	SMP	N = 54	50.3 years	7.4 years	93%	7%
			Wait-list	N = 52	49.3 years	8.5 years	92%	4%

AUTHOR, YEAR TRIAL NAME RISK OF BIAS	TOTAL N FOLLOW-UP	POPULATION DESCRIPTION	STUDY GROUP	GROUP N	MEAN AGE	MEAN PAIN DURATION	% FEMALE	% NON-WHITE
DIABETES								
Andreae, 2021[32] Living Healthy Moderate	N = 230 52 weeks	Adults with diabetes and chronic pain	SMP	N = 122	60.0 years	NR	84%	98%
			Education	N = 108	57.9 years	NR	75%	95%
HIV								
Merlin, 2018[33] STOMP High	N = 43 16 weeks	Adults living with HIV and chronic pain	SMP	n= 22	51 years	NR	50%	86%
			Usual care	N = 22	51 years	NR	64%	91%
IRRITABLE BOWEL SYNDROME								
Chen, 2022[28] Moderate	N = 80 12 weeks	Young adults with IBS	SMP	N = 39	21.2 years	3.0 years	82.1%	20.5%
			Education	N = 41	21.5 years	3.2 years	70.7%	24.4%
MULTIPLE SCLEROSIS								
Ehde, 2015[37] TakeCharge Low	N = 163 52 weeks	Adults with multiple sclerosis and fatigue, depression, or pain	SMP	N = 75	51.0 years	> 5 years: 72%	89.3%	17.3%
			Education	N = 88	53.2 years	> 5 years: 74%	85.2%	15.9%
MUSCULOSKELETAL PAIN								
Matthias, 2020[31] ECLIPSE Moderate	N = 213 36 weeks	Veterans with chronic musculoskeletal pain	SMP	N = 119	55.4 years	NR	20.2%	36.2%
			Education	N = 94	58.6 years	NR	17.0%	41.5%

Abbreviations. BMI: body mass index; HIV: human immunodeficiency virus; IBS: irritable bowel syndrome; LBP: low back pain; NR: not reported; OA: osteoarthritis; PA: physical activity; RA: rheumatoid arthritis; RCT: randomized controlled trial; SMP: self-management program; WM: weight management.

TABLE D2. INTERVENTION AND CONTROL CHARACTERISTICS FOR INCLUDED STUDIES ON SELF-MANAGEMENT PROGRAMS FOR CHRONIC PAIN

AUTHOR, YEAR TRIAL NAME RISK OF BIAS	SELF-MANAGEMENT PROGRAM DESCRIPTION			
	MODALITY FORMAT FACILITATOR TYPE	DURATION SCHEDULE TOTAL DOSE	CONTENT	CONTROL GROUP(S) DESCRIPTION
Allen, 2019[42] STAART Low	■ Synchronous: telephone ■ Individual ■ Clinicians: certified counselors	■ 11 weeks ■ weekly 30-45 min sessions ■ 8 hours total	**SMP alone** ■ Relaxation ■ Goal setting ■ Problem solving ■ Coping with pain ■ CBT	**Usual care** No additional details provided
Andreae, 2021[32] Living Healthy Moderate	■ Synchronous: telephone ■ Individual ■ Peers	■ 12 weeks ■ 8x 30-60 min telephone sessions (weekly most weeks); each week also had a 15-30 min video ■ 12 hours total	**SMP alone** ■ Healthy eating ■ Physical activity ■ Stress management ■ Communication with health care provider ■ Medication adherence ■ Social support ■ Goal setting ■ CBT	**Education** Control group participants received an equal number of sessions of similar length delivered by a trained peer supporter. Topics covered included: dementia and Alzheimer disease, breast cancer, colorectal cancer, osteoporosis and fall prevention, oral health, eye health, foot care, and driving safety.
Barone Gibbs, 2018[34] Stand Back Moderate	■ Synchronous: telephone ■ Individual ■ Clinicians: physical therapist, trained interventionist	■ 24 weeks ■ Initial 90-min meeting, then 15-20 min monthly phone calls for 6 months ■ 3.5 hours total	**SMP + physical activity** ■ Health risks of sedentary behavior ■ Pain management (CBT) ■ Goal setting ■ Social support	**Usual care** No additional details provided
Chen, 2022[28] Moderate	■ Asynchronous: online modules ■ Individual ■ Clinicians: registered nurses	■ 13 weeks ■ 10x 15-min videos delivered on sequential days + 3x 20-30 min telephone consultations with clinicians + 12	**SMP alone** ■ Goal setting and action plans ■ Pain management ■ Relaxation ■ Stress management ■ Healthy eating	**Education** 10x 15-min online videos with content including IBS-related pain neurophysiology and the brain–gut axis, triggers of IBS-related pain and IBS pain self-management strategies

AUTHOR, YEAR TRIAL NAME RISK OF BIAS	SELF-MANAGEMENT PROGRAM DESCRIPTION			
	MODALITY FORMAT FACILITATOR TYPE	DURATION SCHEDULE TOTAL DOSE	CONTENT	CONTROL GROUP(S) DESCRIPTION
		weeks of daily symptom diaries ■ 4 hours total		
Conn, 2013[40] Moderate	■ Synchronous: in-person ■ Group ■ Clinicians (not specified)	■ 6 weeks ■ Weekly 120-min sessions ■ 12 hours total	**SMP alone (i.e., ASMP)**	**Usual care** Includes the use of NSAIDs, low doses of prednisone (≤ 10 mg/day), and DMARDs, depending on the extent and activity of disease.
DeBar, 2022[30] PPACT Low	■ Synchronous: in-person ■ Group ■ Clinicians: behavioral health specialist, nurse care manager, physical therapist, pharmacist	■ 12 weeks ■ Weekly 90-minute sessions ■ 18 hours total	**SMP alone** ■ Progressive muscle relaxation and brief applied relaxation techniques ■ Activity–rest cycling ■ Pleasant activity scheduling ■ Guided imagery and other distraction techniques ■ Emotional regulation skills ■ CBT ■ Problem solving ■ Relapse prevention and maintenance	**Usual care** Clinicians continued to provide pharmacologic and nonpharmacologic treatments to their patients without restriction
Ehde, 2015[37] TakeCharge Low	■ Synchronous: telephone ■ Individual ■ Clinicians: psychologists, social workers	■ 8 weeks ■ Weekly 45-60 min telephone sessions + 15-minute follow-up calls at 4 and 8 weeks posttreatment ■ 8.5 hours total	**SMP alone** ■ Self-monitoring ■ Identifying strengths and priorities ■ Goal-setting ■ Behavioral activation ■ Relaxation techniques ■ Managing thoughts and emotions (CBT)	**Education** Telephone calls informing participants about fatigue, pain, depression, and other common multiple sclerosis challenges without teaching, rehearsing, or prescribing any specific self-management skills, although interactive discussion was encouraged.

AUTHOR, YEAR TRIAL NAME RISK OF BIAS	SELF-MANAGEMENT PROGRAM DESCRIPTION			
	MODALITY FORMAT FACILITATOR TYPE	DURATION SCHEDULE TOTAL DOSE	CONTENT	CONTROL GROUP(S) DESCRIPTION
Fanning, 2022[29] MORPH High	■ Synchronous: in-person, online ■ Group ■ Clinicians: registered dieticians, social worker	■ 12 weeks ■ 3 in-person meetings (1 hr/week), 9 WebEx meetings (1 hr/week) ■ 12 hours total	**SMP + physical activity** ■ Goal-setting and revision ■ Importance of physical activity ■ Healthy eating ■ Pain management ■ Mindfulness	**Wait-list** No interaction during study period
Focht, 2014[44] IMPACT-P Low	■ Synchronous: in-person ■ Group ■ Clinicians (not specified)	■ 12 weeks ■ 27x 80-min center-based sessions ■ 36 hours total	**SMP + physical activity** ■ 60 min of moderate intensity walking ■ 20 min of group CBT for pain management and coping skills	**Exercise only** ■ 3x 1-hr sessions per week for 12 weeks (total 36 hours) ■ Each exercise session consisted of 30-40 min of moderate intensity walking and 20 min of lower body strength training.
Goode, 2018[43] PACe-LBP Moderate	■ Synchronous: telephone, in-person ■ Individual ■ Clinicians: physical therapists, exercise counselor	■ 12 weeks ■ 10 weekly sessions with exercise counselor, 3 phone calls every 4 weeks with physical therapist; all calls 15 min ■ 4.75 hours total	**SMP + physical activity** ■ Personalized physical activity recommendations ■ Overcoming pain-related barriers ■ Managing pain associated with activity ■ Progressive muscle relaxation ■ CBT	**Exercise only** ■ 10 weekly sessions with exercise counselor, 3 phone calls every 4 weeks with physical therapist **Wait-list** ■ No contact during study period
Matthias, 2020[31] ECLIPSE Moderate	■ Synchronous: telephone, in-person ■ Individual ■ Peers	■ 24 weeks ■ 12 peer discussion sessions over 6 months ■ 12 hours total	**SMP alone** ■ Pain self-management ■ Relaxation skills ■ Activity pacing ■ Cognitive behavioral skills ■ Self-care skills	**Education** One 2-hour pain self-management class taught by a research team member with expertise in pain self-management. The control class covered self-management topics but did not offer ongoing contact, support, or encouragement.

AUTHOR, YEAR TRIAL NAME RISK OF BIAS	SELF-MANAGEMENT PROGRAM DESCRIPTION			
	MODALITY FORMAT FACILITATOR TYPE	DURATION SCHEDULE TOTAL DOSE	CONTENT	CONTROL GROUP(S) DESCRIPTION
Merlin, 2018[33] STOMP High	■ Synchronous: in-person ■ Individual and group ■ Clinicians (social workers) and peers	■ 12 weeks ■ 12 sessions: 6 individual and 6 group sessions alternating weekly ■ 12 hours total	**SMP alone** ■ Goal setting ■ Pain management ■ Sleep ■ Communication with family and providers ■ Medication adherence	**Usual care** No additional details provided
Shadick, 2013[38] Moderate	■ Synchronous: in-person ■ Group and individual ■ Clinicians: psychologists, social workers, certified nurse specialist in psychiatry	■ 36 weeks ■ Group meetings every 2 weeks for 3 months, then every 4 weeks for 6 months, then 15 biweekly 50-min individual meetings over 9 months ■ 22.5 hours total	**SMP alone** ■ Emotional regulation ■ Rheumatoid arthritis symptoms ■ Fatigue management ■ Social functioning and communication ■ Stress management	**Education** One group meeting, then monthly mailed educational information about rheumatoid arthritis and phone call from research assistant. The mailed materials did not include any information on coping or stress reduction.
Shigaki, 2013[39] RAHelp Moderate	■ Asynchronous: online modules, written materials ■ Individual ■ Clinicians: counselors	■ 10 weeks ■ Weekly online modules + 15-30 min telephone sessions + written materials and peer support forum ■ 15 hours total	**SMP alone** ■ Stress management and coping skills ■ Goal setting ■ Pain management ■ Emotional responses ■ Managing change ■ Self-esteem ■ Relationships ■ Community participation ■ CBT	**Wait-list** No contact during study period

AUTHOR, YEAR TRIAL NAME RISK OF BIAS	SELF-MANAGEMENT PROGRAM DESCRIPTION			
	MODALITY FORMAT FACILITATOR TYPE	DURATION SCHEDULE TOTAL DOSE	CONTENT	CONTROL GROUP(S) DESCRIPTION
Somers, 2012[41] OA Life Moderate	■ Synchronous: in-person ■ Group ■ Clinicians: psychologists	■ 24 weeks ■ For weeks 1 to 12, 60-min group sessions held weekly. For weeks 12 to 24, 60-min group sessions held every other week ■ 24 hours total	**SMP alone** ■ Pain coping skills ■ Relaxation ■ Goal setting ■ Activity cycling ■ CBT **SMP + weight management** ■ SMP described above ■ Elements related to weight loss: lifestyle, exercise, attitudes, relationships, and nutrition ■ Appetite awareness training	**Usual care** No additional details provided **Weight management** (not used as a direct comparator to SMP groups) ■ Elements related to weight loss: lifestyle, exercise, attitudes, relationships, and nutrition ■ Appetite awareness training
Sullivan, 2017[35] Moderate	■ Synchronous: telephone, in-person ■ Individual ■ Clinicians: physician assistants	■ 22 weeks ■ 1 initial motivational interviewing-based session + 17 weekly, 30-min sessions + 3 "booster" telephone sessions ■ 15 hours total	**SMP alone** ■ Opioid tapering ■ Pain coping skills ■ Stress management ■ Relaxation training	**Usual care** Patients received care for their pain, including opioid prescriptions from their usual prescribers, as they would as if they were not in the study, with no restrictions other than avoiding buprenorphine for the duration of the study.
Thorn, 2019[45] LAMP High	■ Synchronous: in-person ■ Group ■ Clinicians: psychologists	■ 10 weeks ■ Weekly 90-min sessions ■ 15 hours total	**CBT-based SMP** ■ motivational reinforcement ■ pain education ■ pain management skills training (e.g., cognitive restructuring, activity pacing, and relaxation	**Education**[a] Pain-related information aimed toward pain self-management and group discussion, but no specific skill-building exercises were taught. **Usual care** Any nonpsychological pain management method, including medication, chiropractic, or

AUTHOR, YEAR TRIAL NAME RISK OF BIAS	SELF-MANAGEMENT PROGRAM DESCRIPTION			
	MODALITY FORMAT FACILITATOR TYPE	DURATION SCHEDULE TOTAL DOSE	CONTENT	CONTROL GROUP(S) DESCRIPTION
				physical therapy. Those randomly assigned to usual care had parallel contact with participant coordinators and assessors, as well as intermittent phone contact to facilitate retention, but received no psychosocial treatment
Waters, 2016[36] High	■ Synchronous: in-person ■ Individual ■ Clinicians: psychologists	■ 12 weeks ■ Weekly 90-min sessions ■ 18 hours total	**SMP alone** ■ Goal setting ■ Self-regulation ■ Pain management ■ Low back pain education ■ Depression management ■ Interpersonal interactions ■ CBT	**Education** 12 weekly sessions including detailed information on the nature of low back pain, treatment methods, exercises, and methods for maintaining mobility and function at individual education sessions **Usual care** Patients in the usual care control group continued to receive the standard medical care provided to depressed patients with persistent LBP but did not receive any additional intervention focused on either depression or pain management

Notes. [a] In the LAMP trial, the education group was not directly compared with the SMP group.
Abbreviations. ASMP: Arthritis Self-Management Program; CBT: cognitive behavioral therapy; DMARD: disease-modifying antirheumatic drug; IBS: irritable bowel syndrome; LAMP: Learning About My Pain; LBP: low back pain; NSAID: nonsteroidal anti-inflammatory drug; SMP: self-management program.

Table D3. PATIENT-REPORTED OUTCOME MEASUREMENT SCALES, DEFINITIONS AND INTERPRETATION

MEASUREMENT SCALE	ABBREVIATION	SCORE RANGE	INTERPRETATION
HRQoL: OVERALL			
Arthritis Impact Measurement Scale-2	AIMS2	0 to 10 points	Higher scores indicate more severe disability
Health Assessment Questionnaire	HAQ	Global health score 0 to 3 points	Higher scores indicate more severe disability
Irritable Bowel Syndrome Quality of Life	IBS-QoL	0 to 100 points	Higher scores indicate better quality of life
Modified Health Assessment Questionnaire	MHAQ	0 to 3 points	Higher scores indicate more severe disability
Owestry Disability Index	ODI	0 to 50 points	Higher scores indicate more severe disability
Patient Global Impression of Change	PGIC	1 to 7 points	Lower scores (1-3): perceptions of improved health Score of 4: no change Higher scores (5-7): perceptions of worsened health
Patient-Reported Outcomes Measurement Information System	PROMIS	HAQ component score Raw score converted to T-Score, with mean of 50 and SD of 10	T-scores above 50 indicate greater than average physical function; T-scores below 50 indicate lower than average physical function
Short Form 36-item survey	SF-36	Perception of general health score 0 to 100 points	Higher scores indicate perceptions of greater general health
Roland Morris Disability Questionnaire	RMDQ	0 to 24 points	Higher scores indicate worse pain and disability
Western Ontario and McMaster Universities Arthritis Index	WOMAC	0 to 96 points	Higher scores indicate worse pain and functional limitations
HRQoL: PAIN SEVERITY			
Arthritis Impact Measurement Scale-2	AIMS2	0 to 10 points	Higher scores indicate more severe pain

MEASUREMENT SCALE	ABBREVIATION	SCORE RANGE	INTERPRETATION
Brief Pain Inventory	BPI	Pain intensity: 0 to 10 points Pain interference: 0 to 10 points	Worst pain score: 1-4: mild pain 5-6: moderate pain 7-10: severe pain
McGill Pain Questionnaire	--	Present pain intensity score: 0 to 5 points	Higher scores indicate more severe pain
Pain Numeric Rating Scale	NRS	0 to 10 points	Higher scores indicate more severe pain
Pain, Enjoyment of Life, and General Activity Scale	PEG	Overall and pain intensity: 0 to 10 points	Higher scores indicate more intense pain and more interference
Pain, Enjoyment of Life, General Activity, and Sleep Scale	PEGS	0 to 10 points	Higher scores indicate worse pain and interference
Patient-Reported Outcomes Measurement Information System	PROMIS-PI	Pain interference subscale Raw score converted to T-Score, with mean of 50 and SD of 10	T-scores above 50 indicate greater than average pain interference; T-scores below 50 indicate lower than average pain interference
Short Form 36-item survey	SF-36	Bodily pain subscale: 0 to 100 points	Lower scores indicate more pain
Western Ontario and McMaster Universities Arthritis Index	WOMAC	Pain subscale: 0 to 20 points	Higher scores indicate worse pain
DEPRESSION			
Beck Depression Inventory	BDI	0 to 63 points	Higher scores indicate more severe depression: 1-10: Considered normal 11-16: Mild mood disturbance 17-20: Borderline clinical depression 21-30: Moderate depression 31-40: Severe depression Over 40: Extreme depression
Center for Epidemiologic Studies Depression	CES-D	0 to 60 points	Higher scores indicate greater depressive symptoms

MEASUREMENT SCALE	ABBREVIATION	SCORE RANGE	INTERPRETATION
Patient Health Questionnaire: 8-item and 9-item	PHQ-8 PHQ-9	0 to 24 points 0 to 27 points	10 or greater: Major depression 20 or greater: Severe major depression
Patient-Reported Outcomes Measurement Information System	PROMIS	Depression subscale: Raw score converted to T-Score, with mean of 50 and SD of 10	T-scores above 50 indicate greater than average depressive symptoms; T-scores below 50 indicate fewer than average depressive symptoms
SELF-EFFICACY			
Arthritis Self Efficacy Scale	ASES	0 to 10 points	Lower scores indicate less self-efficacy
Coping Strategies Questionnaire	CSQ	Overall score without catastrophizing: 0 to 30 points	Higher scores indicate more frequent use of coping strategies
Mobility-Related Self-Efficacy	MRSE	0 to 100 points	Higher scores indicate greater belief in one's ability to complete more challenging increments of walking during the 400-m walk task
Pain Self-Efficacy Questionnaire	PSEQ	0 to 60 points	Higher scores indicate greater confidence in managing pain
Patient Activation Measure	PAM	0 to 100 points 4 levels of activation	Levels 1 and 2 indicate lower patient activation Levels 3 and 4 indicate higher patient activation
Self-Efficacy to Manage Chronic Disease	SEMCD	1 to 10 points	Higher scores indicate greater confidence in managing chronic disease
Self-efficacy for walking	--	0 to 10 points	Higher scores indicate greater confidence in ability to walk over incrementally longer durations without stopping
Self-Regulatory Self-Efficacy	SRSE	0 to 100 points	Higher scores indicate greater belief in one's ability to successfully organize, plan, and schedule regular exercise and/or physical activity
University of Washington Self-Efficacy Scale	UW-SES	Summary score converted to T-score, with mean of 50 and SD of 10	T-scores above 50 indicate greater than average self-efficacy; T-scores below 50 indicate lower than average self-efficacy

Abbreviations. HRQoL: health-related quality of life; SD: standard deviation.

TABLE D4. DETAILED HEALTH-RELATED QUALITY OF LIFE OUTCOMES, ALL TIMEPOINTS, FOR INCLUDED STUDIES ON SMPs FOR CHRONIC PAIN

AUTHOR, YEAR	OUTCOME[a]	FOLLOW-UP	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN-GROUP	*P* VALUE
			G1	N	ESTIMATE[b]	G2	N	ESTIMATE[b]		
OVERALL QoL										
Allen, 2019[42]	WOMAC: total score	12 weeks	SMP	110	46.4 (95% CI, 43.5 to 49.3)	WL	117	49.0 (95% CI, 46.2 to 51.9)	MD, −2.6 (95% CI, −6.0 to 0.8)	*P* = .13
		36 weeks	SMP	98	44.2 (95% CI, 41.0 to 47.4)	WL	112	47.5 (95% CI, 44.4 to 50.6)	MD, −3.3 (95% CI, −7.1 to 0.4)	*P* = .08
Andreae, 2020[32]	WOMAC: total score	12 weeks	SMP	96	30 (19); MD, −10 (13)	EDU	99	37 (19); MD, −5 (18)	NR	*P* = .002
	WOMAC: total score (model 1)	52 weeks	SMP	89	LSM, −11.7 (95% CI, −14.5 to −8.8)	EDU	86	LSM, 0.0 (95% CI, −3.7 to 4.2)	MD, 11.9	*P* < .001
	WOMAC: total score (model 2)	52 weeks	SMP	89	LSM, −10.7 (95% CI, −14.7 to −6.7)	EDU	86	LSM, 1.8 (95% CI, −2.5 to 6.2)	MD, 12.6	*P* < .001
Barone Gibbs, 2018[34]	ODI: overall disability	12 weeks	SMP + PA	12	13.5% (11.7%)	UC	12	21.9% (14.9%)	NR	*P* < .05
		16 weeks	SMP + PA	12	12.9% (9.6%)	UC	12	20.6% (15.1%)	NR	NS
		26 weeks	SMP + PA	12	12.3% (9.0%) MD, −50%	UC	12	20.1% (14.2%) MD, −14%	NR	*P* = .04
Chen, 2022[28]	IBS QoL: total score	12 weeks	SMP	26	77.2 (14.7) Adj. MD, 10.5	EDU	30	72.5 (25.5) Adj. MD, 4.4	MDIC, 6.1	*P* = .04
Conn, 2013[40]	HAQ: global health	26 weeks	SMP	33	1.6 (95% CI, 1.4 to 1.8)	UC	40	1.4 (95% CI, 1.2 to 1.7)	NR	NR
		52 weeks	SMP	36	1.7 (95% CI, 1.5 to 1.9)	UC	35	1.5 (95% CI, 1.3 to 1.7)	NR	NR

AUTHOR, YEAR	OUTCOME[a]	FOLLOW-UP	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN-GROUP	*P* VALUE
			G1	N	ESTIMATE[b]	G2	N	ESTIMATE[b]		
		78 weeks	SMP	34	1.6 (95% CI, 1.4 to 1.8)	UC	41	1.5 (95% CI, 1.3 to 1.7)	NR	*P* = .30
DeBar, 2022[30]	RMDQ: total score	12 weeks	SMP	336	0.61 (95% CI, 0.59 to 0.63)	UC	330	0.68 (95% CI, 0.65 to 0.70)	MDIC, −0.04 (95% CI, −0.06 to −0.02)	NR
		52 weeks	SMP	336	0.60 (95% CI, 0.58 to 0.63) MD, −0.07 (95% CI, −0.09 to −0.05)	UC	330	0.68 (95% CI, 0.66 to 0.71) MD, −0.01 (95% CI, −0.03 to 0.01)	MDIC, −0.06 (95% CI, −0.08 to −0.04)	NR
	RMDQ: ≥ 30% decrease in score from baseline	12 weeks	SMP	328	42 (12.8%)	UC	321	30 (9.3%)	RR, 1.81 (95% CI, 1.22 to 2.68)	NR
		52 weeks	SMP	307	42 (12.8%)	UC	293	30 (9.3%)	RR, 2.43 (95% CI, 1.67 to 3.51)	NR
Ehde, 2015[37]	50% reduction in pain, fatigue, or depression	24 weeks	SMP	75	38 (61%)	EDU	88	39 (50%)	OR, 1.51 (95% CI, 0.77 to 2.97)	NR
		52 weeks	SMP	75	28 (47%)	EDU	88	45 (57%)	OR, 0.66 (95% CI, 0.33 to 1.31)	NR
Fanning, 2022[29]	SF–36: general health score	12 weeks	SMP + PA	15	Adj. mean 56.3 (SE, 5.1)	WL	13	Adj. mean 56.5 (SE, 4.9)	F = 0.5	*P* = .50
Goode, 2018[43]	PROMIS: HAQ component	12 weeks	SMP + PA	16	MD, −0.89 (95% CI, −6.36 to 4.57)	WL	15	MD, 3.21 (95% CI, −1.61 to 8.02)	MD, −4.1 (95% CI, −11.7 to 3.5)	NR
		12 weeks	SMP + PA	16	MD, −0.89 (95% CI, −6.36 to 4.57)	PA	19	MD, −2.90 (95% CI, −7.22 to 1.43)	MD, 2.0 (95% CI, −5.3 to 9.3)	NR
	RMDQ: total score	12 weeks	SMP + PA	16	MD, −1.11 (95% CI, −3.05 to 0.83)	WL	15	MD, 0.89 (95% CI, −1.11 to 2.88)	MD, −2.0 (95% CI, −4.9 to 0.9)	NR
		12 weeks	SMP + PA	16	MD, −1.11 (95% CI, −3.05 to 0.83)	PA	19	MD, −3.21 (95% CI, −5.01 to −1.41)	MD, 2.1 (95% CI, −0.6 to 4.8)	NR

AUTHOR, YEAR	OUTCOME[a]	FOLLOW-UP	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN-GROUP	*P* VALUE
			G1	N	ESTIMATE[b]	G2	N	ESTIMATE[b]		
Matthias, 2020[31]	SF-36: general health score	24 weeks	SMP	92	52.7 (21.7) MD, −0.92 (95% CI, −4.37 to 2.53)	EDU	86	50.1 (19.7) MD, −3.13 (95% CI, −6.68 to 0.41)	MDIC, 2.21 (95% CI, −2.73 to 7.16)	*P* = .38
		36 weeks	SMP	85	50.9 (21.5) MD, −1.96 (95% CI, −5.52 to 1.60)	EDU	82	51.9 (21.0) MD, −2.06 (95% CI, −5.67 to 1.54)	MDIC, 0.10 (95% CI, −4.97 to 5.16)	*P* = .97
Shadick, 2013[38]	MHAQ: total score	36 weeks	SMP	38	0.8 (95% CI, 0.5 to 1.0)	EDU	40	0.9 (95% CI, 0.6 to 1.3)	MD, −0.3 (95% CI, −0.6 to 0.1)	*P* = .11
		78 weeks	SMP	38	0.9 (95% CI, 0.6 to 1.1)	EDU	40	0.9 (95% CI, 0.6 to 1.3)	MD, −0.2 (95% CI, −0.5 to 0.1)	*P* = .13
Shigaki, 2013[39]	AIMS2: overall physical health	46 weeks	SMP	43	1.6 (1.6)	WL	45	1.6 (1.5)	ES, 0.48	*P* = .16
Sullivan, 2017[35]	PGIC: moderate improvement or greater	22 weeks	SMP	16	9 participants (56%)	UC	15	3 participants (23%)	NR	*P* = .13
		34 weeks	SMP	16	10 participants (62%)	UC	16	6 participants (37%)	NR	*P* = .29
PAIN SEVERITY										
Allen, 2019[42]	WOMAC: pain subscale	12 weeks	SMP	110	9.42 (95% CI, 8.77 to 10.06)	WL	117	10.05 (95% CI, 9.42 to 10.68)	MD, −0.63 (95% CI, −1.45 to 0.18)	*P* = .13
		36 weeks	SMP	98	8.77 (95% CI, 8.04 to 9.50)	WL	112	9.61 (95% CI, 8.91 to 10.30)	MD, −0.84 (95% CI, −1.73 to 0.06)	*P* = .07
Andreae, 2020[32]	McGill: pain intensity score	12 weeks	SMP	96	LSM, −4.4 (95% CI, −6.3 to −2.5)	EDU	99	LSM, −2.2 (95% CI, −4.0 to −0.5)	MD, 2.1	*P* = .07
		52 weeks	SMP	89	LSM, −4.0 (95% CI, −6.4 to −1.6)	EDU	86	LSM, 0.4 (95% CI, −2.2 to 2.3)	MD, 4.0	*P* = .01

AUTHOR, YEAR	OUTCOME[a]	FOLLOW-UP	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN-GROUP	*P* VALUE
			G1	N	ESTIMATE[b]	G2	N	ESTIMATE[b]		
	WOMAC: pain subscale	12 weeks	SMP	96	31 (21) MD, −10.5 (19)	EDU	99	37.9 (19) MD, −4.8 (21)	NR	*P* = .01
Chen, 2022[28]	BPI: pain intensity	12 weeks	SMP	26	1.8 (1.3) Adj. MD, −0.7	EDU	30	2.1 (1.5) Adj. MD, −0.6	MDIC, −0.1	*P* = .67
DeBar, 2022[30]	PEG: pain total score	12 weeks	SMP	373	5.58 (95% CI, 5.37 to 5.80)	UC	366	6.30 (95% CI, 6.08 to 6.51)	MDIC, −0.61 (95% CI, −0.85 to −0.37)	NR
		52 weeks	SMP	362	5.70 (95% CI, 5.47 to 5.93)	UC	351	6.24 (95% CI, 6.01 to 6.47)	MD, −0.43 (95% CI, −0.70 to −0.17)	NR
	PEG: ≥ 30% decrease in score from baseline	12 weeks	SMP	372	98 (26.3%)	UC	366	50 (13.7%)	RR, 1.92 (95% CI, 1.48 to 2.50)	NR
		52 weeks	SMP	362	93 (25.7%)	UC	351	60 (17.1%)	RR, 1.42 (95% CI, 1.11 to 1.81)	NR
Ehde, 2015[37]	Pain numeric rating scale: total score	24 weeks	SMP	75	MD, −0.4 (95% CI, 0.01 to 1.05)	EDU	88	MD, −0.6 (95% CI, 0.10 to 1.07)	Cohen's d, −0.07 (95% CI, −0.41 to 0.26)	NR
		52 weeks	SMP	75	MD, −0.3 (95% CI, −0.17 to 0.77)	EDU	88	MD, −0.8 (95% CI, 0.17 to 1.25)	NR	NR
Fanning, 2022[29]	SF-36: bodily pain	12 weeks	SMP + PA	15	Adj. mean 54.1 (SE, 6.3)	WL	13	Adj. mean 43.7 (SE, 6.1)	NR	*P* = .05
Matthias, 2020[31]	BPI: pain intensity	24 weeks	SMP	92	5.8 (1.9) MD, −0.35 (95% CI, −0.66 to −0.05)	EDU	86	5.7 (1.7) MD, −0.18 (95% CI, −0.50 to 0.13)	MDIC, −0.17 (95% CI, −0.61 to 0.27)	*P* = .44
		36 weeks	SMP	85	5.7 (1.7) MD, −0.42 (95% CI, −0.74 to −0.10)	EDU	82	5.6 (1.8) MD, −0.36 (95% CI, −0.68 to −0.04)	MDIC, −0.06 (95% CI, −0.51 to 0.39)	*P* = .79
	BPI: pain intensity	16 weeks	SMP	19	MD, −2.0 (2.1)	UC	17	MD, −0.9 (1.6)	NR	*P* = .11

AUTHOR, YEAR	OUTCOME[a]	FOLLOW-UP	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN-GROUP	*P* VALUE
			G1	N	ESTIMATE[b]	G2	N	ESTIMATE[b]		
Merlin, 2018[33]	PEG: pain intensity	16 weeks	SMP	19	MD, −1.5 (1.9)	UC	17	MD, −1.4 (2.3)	NR	*P* = .93
Shigaki, 2013[39]	AIMS2: pain in the past 4 weeks	36 weeks	SMP	43	4.1 (2.6)	WL	45	4.3 (2.5)	ES, 0.31	*P* = .34
	RADAR: pain intensity today	36 weeks	SMP	43	41.4 (31.2)	WL	45	39.2 (29.6)	ES, 0.19	*P* = .58
Somers, 2012[41]	AIMS: pain scale	104 weeks	SMP	60	4.4 (95% CI, 4.1 to 4.8)	UC	51	4.7 (95% CI, 4.3 to 5.1)	NR	NR
		104 weeks	SMP + WM	62	4.0 (95% CI, 3.7 to 4.3)	UC	51	4.7 (95% CI, 4.3 to 5.1)	MD, 0.70 (95% CI, 0.10 to 1.3)	*P* = .01
	WOMAC: pain subscale	104 weeks	SMP	60	34.5 (95% CI, 30.8 to 38.2)	UC	51	38.0 (95% CI, 34.1 to 41.8)	NR	NR
		104 weeks	SMP + WM	62	27.2 (95% CI, 23.9 to 30.4)	UC	51	38.0 (95% CI, 34.1 to 41.8)	MD, 10.8 (95% CI, 4.6 to 16.9)	*P* = .002
Sullivan, 2017[35]	BPI: pain intensity	22 weeks	SMP	16	4.72 (1.62)	UC	15	5.77 (1.92)	Adj. MD −0.68 (95% CI, −2.01 to 0.64)	*P* = .30
		34 weeks	SMP	16	4.67 (1.79)	UC	15	6.16 (2.64)	Adj. MD −0.91 (95% CI, −2.30 to 0.48)	*P* = .19
Thorn, 2018[45]	BPI: pain intensity	BL	SMP	95	6.5 (1.8)	UC	98	6.5 (1.6)	NA	NA
		10 weeks	SMP	95	MD, −1.06 (95% CI, −1.65 to −0.47)	UC	98	MD, −0.26 (95% CI, −0.61 to 0.08)	MDIC, −0.80 (95% CI, −1.48 to −0.11)	*P* = .02
		24 weeks	SMP	95	MD (10 to 24 weeks), 0.35 (95% CI, −0.05 to 0.76)	UC	98	MD (10 to 24 weeks), −0.24 (95% CI, −0.60 to 0.11)	MDIC, 0.60 (95% CI, 0.06 to 1.13)	*P* = .03[c]

AUTHOR, YEAR	OUTCOME[a]	FOLLOW-UP	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN-GROUP	*P* VALUE
			G1	N	ESTIMATE[b]	G2	N	ESTIMATE[b]		
	BPI: ≥ 30% improvement in score from baseline	10 weeks	SMP	82	25 (30.5%)	UC	78	9 (11.5%)	OR, 3.43 (95% CI, 2.72 to 4.32)	NR
		24 weeks	SMP	69	15 (21.7%)	UC	71	6 (8.5%)	OR, 2.70 (95% CI, 2.46 to 2.96)	NR
	BPI: mean % reduction in score from baseline[d]	24 weeks	SMP	69	−10.83% (95% CI, −26.08 to 4.42)	UC	71	−7.75% (95% CI, −18.46 to 2.94)	NR	NR
Waters, 2016[36]	Pain numeric rating scale: total score	24 weeks	SMP	17	6.94 (2.14)	EDU	16	6.75 (2.09)	NR	NR
		24 weeks	SMP	17	6.94 (2.14)	UC	21	6.48 (1.92)	NR	NR

Notes. [a] See Table D3 for measurement scale ranges and interpretation. [b] Estimates are means and standard deviations unless otherwise noted. [c] For the comparisons from posttreatment to 6-mo follow-up in the LAMP trial, statistically significant values indicate that treatment gains were no longer maintained; in terms of pain intensity, the significant treatment difference between SMP and UC at 10 weeks was attenuated at 24 weeks. [d] Minimally important change for pain intensity (BPI-Intensity score) was defined by study authors as > 10%.
Abbreviations. Adj.: adjusted; AIMS: Arthritis Impact Measurement Scale; BL: baseline; BPI: Brief Pain Inventory; CI: confidence interval; EDU: education; ; ES: effect size; G1: study group 1; G2: study group 2; HAQ: Health Assessment Questionnaire; IBS: irritable bowel syndrome; LSM: least square mean; MD: mean difference; MDIC: mean difference in change; MHAQ: modified Health Assessment Questionnaire; NA: not applicable; NR: not reported; NS: not significant; ODI: Owestry Disability Index; OR: odds ratio; PA: physical activity; PEG: Pain, Enjoyment of Life, and General Activity Scale; PGIC: Patient Global Impression of Change; PROMIS: Patient-Reported Outcomes Measurement Information System; QoL: quality of life; RMDQ: Roland-Morris Disability Questionnaire; RR: relative risk; SE: standard error; SF-36: Short Form 36-item survey; SMP: self-management program; UC: usual care; WL: wait-list; WM: weight management; WOMAC: Western Ontario and McMaster Universities Arthritis Index.

TABLE D5. DEPRESSION OUTCOMES, ALL TIMEPOINTS, FOR INCLUDED STUDIES ON SMPs FOR CHRONIC PAIN

AUTHOR, YEAR	OUTCOME[a]	FOLLOW-UP	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN-GROUP	*P* VALUE
			G1	N	ESTIMATE[b]	G2	N	ESTIMATE[b]		
Allen, 2019[42]	PHQ-8: total score	12 weeks	SMP	110	5.9 (95% CI, 5.0 to 6.8)	WL	117	6.4 (95% CI, 5.5 to 7.2)	MD, −0.5 (95% CI, 1.6 to 0.6)	*P* = .36
		24 weeks	SMP	98	5.3 (95% CI, 4.4 to 6.2)	WL	112	6.3 (95% CI, 5.4 to 7.2)	MD, −1.0 (95% CI, −2.2 to 0.2)	*P* = .09
Andreae, 2020[32]	CES–D: total score	BL	SMP	89	7.2 (4.2)	EDU	87	7.9 (4.7)	NA	NA
		12 weeks	SMP	89	4.5 (3.8); MD, −2.7 (3.8)	EDU	87	7.1 (4.6); MD, −0.8 (3.3)	NR	*P* = .001
		52 weeks	SMP	89	5.1 (4.0); MD, −2.0 (3.5)	EDU	87	7.1 (4.4); MD, −0.8 (3.8)	NR	*P* = .03
Chen, 2022[28]	PROMIS: depression score	BL	SMP	39	50.1 (8.2)	EDU	41	52.3 (9.5)	NA	NA
		12 weeks	SMP	26	48.9 (7.3)	EDU	30	52.1 (9.5)	MD, −1.82	*P* = .29
Ehde, 2015[37]	PHQ-9: > 50% reduction in score	9-11 weeks	SMP	26	10 (39%)	EDU	36	9 (24%)	OR, 2.14 (95% CI, 0.70 to 6.56)	NR
		24 weeks	SMP	26	8 (35%)	EDU	36	10 (29%)	OR, 1.41 (95% CI, 0.45 to 4.46)	NR
		52 weeks	SMP	26	7 (32%)	EDU	36	14 (37%)	OR, 1.00 (95% CI, 0.31 to 3.23)	NR
	PHQ-9: total score	9-11 weeks	SMP	75	5.7 (3.7)	EDU	88	7.1 (4.2)	NR	*P* > .05
		24 weeks	SMP	75	5.7 (4.7)	EDU	88	6.7 (4.2)	NR	*P* > .05
		52 weeks	SMP	75	6.3 (4.2)	EDU	88	7.3 (5.0)	NR	*P* > .05
Matthias, 2020[31]	PHQ-8: depression score	BL	SMP	119	9.3 (6.4)	EDU	94	8.9 (6.0)	NA	*P* = .63
		24 weeks	SMP	92	10.1 (6.7) MD, 0.75 (95% CI, −0.32 to 1.82)	EDU	86	9.1 (5.4); MD, 0.01 (95% CI, −1.10 to 1.11)	MDIC, 0.75 (95% CI, −0.79 to 2.28)	*P* = .34

AUTHOR, YEAR	OUTCOME[a]	FOLLOW-UP	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN-GROUP	*P* VALUE
			G1	N	ESTIMATE[b]	G2	N	ESTIMATE[b]		
		36 weeks	SMP	85	9.2 (6.2); MD, −0.03 (95% CI, −1.13 to 1.08)	EDU	82	8.3 (5.8); MD, −0.73 (95% CI, −1.85 to 0.39)	MDIC, 0.70 (95% CI, −0.88 to 2.27)	*P* = .38
Shadick, 2013[38]	BDI: total score	BL	SMP	38	10.2 (95% CI, 8.0 to 12.5)	EDU	40	9.2 (95% CI, 6.9 to 11.6)	NA	NA
		36 weeks	SMP	38	5.6 (95% CI, 3.7 to 7.5)	EDU	40	8.1 (95% CI, 5.4 to 10.9)	MD, −2.9 (95% CI, −6.1 to 0.2)	*P* =.07
		78 weeks	SMP	38	6.9 (95% CI, 4.8 to 9.0)	EDU	40	9.5 (95% CI, 6.7 to 12.4)	MD, −3.2 (95% CI, −5.6 to −0.8)	*P* = .01
Shigaki, 2013[39]	CES-D: total score	36 weeks	SMP	43	10.8 (8.2)	WL	45	13.2 (11.2)	NR	*P* = .14
Sullivan, 2017[35]	PHQ-9: total score	BL	SMP	18	12.56 (8.33)	UC	17	12.29 (6.93)	NR	NR
		22 weeks	SMP	16	8.88 (7.49)	UC	15	11.27 (6.58)	Adj. MD, −2.21 (95% CI, −6.62 to 2.21)	*P* = .32
		34 weeks	SMP	16	9.00 (5.80)	UC	15	11.13 (7.53)	Adj. MD, −1.89 (95% CI, −6.23 to 2.44)	*P* = .38
Thorn, 2018[45]	PHQ-9: total score	BL	SMP	95	11.7 (6.1)	UC	98	11.9 (6.8)	NA	NA
		10 weeks	SMP	95	MD, −2.43 (95% CI, −3.68 to −1.19)	UC	98	MD, −1.10 (95% CI, −2.10 to −0.09)	MD, −1.33 (95% CI, −3.02 to 0.35)	*P* = .12
		24 weeks	SMP	95	MD, (10 to 24 weeks), 0.61 (95% CI, −0.49 to 1.70)	UC	98	MD (10 to 24 weeks), −0.24 (−0.83 to 0.35)	MD (10 to 24 weeks), 0.85 (95% CI, −0.69 to 2.38)	*P* = .29[c]
	PHQ-9: ≥ 30% improvement in score from baseline	24 weeks	SMP	69	29 (42.6%)	UC	71	22 (31.0)	OR, 1.60 (95% CI, 1.41 to 1.82)	NR

AUTHOR, YEAR	OUTCOME[a]	FOLLOW-UP	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN-GROUP	*P* VALUE
			G1	N	ESTIMATE[b]	G2	N	ESTIMATE[b]		
Waters, 2016[36]	BDI: total score	BL	SMP	28	15.66 (7.04)	UC	36	17.40 (7.89)	NA	*P* > .05
		24 weeks	SMP	17	11.75 (6.70)	UC	21	15.60 (8.02)	NR	*P* < .05
		BL	SMP	28	15.66 (7.04)	EDU	37	19.20 (7.06)	NA	*P* > .05
		24 weeks	SMP	17	11.75 (6.70)	EDU	16	17.05 (9.06)	NR	*P* < .07

Notes. [a] See Table D3 for measurement scale ranges and interpretation. [b] Estimates are means and standard deviations unless otherwise noted. [c] For the comparisons from posttreatment to 6-mo follow-up in the LAMP trial, statistically significant values indicate that treatment gains were no longer maintained; for this outcome there were no treatment difference at either timepoint.
Abbreviations. Adj.: adjusted; BDI: Beck Depression Inventory; BL: baseline; CES-D: Center for Epidemiologic Studies Depression; CI: confidence interval; EDU: education; G1: study group 1; G2: study group 2; MD: mean difference; MDIC: mean difference in change; NA: not applicable; NR: not reported; OR: odds ratio; PHQ-8/9: Patient Health Questionnaire 8-item/9-item; PROMIS: Patient-Reported Outcomes Measurement Information System; SMP: self-management program; UC: usual care; WL: wait-list.

TABLE D6. SELF-EFFICACY OUTCOMES, ALL TIMEPOINTS, FOR INCLUDED STUDIES ON SMPs FOR CHRONIC PAIN

AUTHOR, YEAR	OUTCOME[a]	FOLLOW-UP	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN-GROUP	*P* VALUE
			G1	N	ESTIMATE[b]	G2	N	ESTIMATE[b]		
Allen, 2019[42]	ASES: total score	12 weeks	SMP	110	6.7 (95% CI, 6.4 to 7.0)	WL	117	5.7 (95% CI, 5.4 to 6.0)	MD 1.0 (95% CI, 0.6 to 1.4)	*P* < .001
		36 weeks	SMP	98	6.3 (95% CI, 6.0 to 6.7)	WL	112	5.7 (95% CI, 5.3 to 6.0)	MD 1.0 (95% CI, 0.6 to 1.4)	*P* = .002
Andreae, 2020[32]	ASES: total score	12 weeks	SMP	96	80.4 points Adj. MD, +21.5 (95% CI, 16.1 to 26.3)	EDU	99	60.5 points; Adj. MD, +4.6 (95% CI, –0.04 to 9.3)	MD, 16.5	*P* < .001
		52 weeks	SMP	89	79.5 points Adj. MD, +23.7 (95% CI, 17.1 to 30.4)	EDU	86	63.2 points; Adj. MD, +6.8 (95% CI, –0.1 to 13.8)	MD, 16.9	*P* < .001
Chen, 2022[28]	SEMCD: total score	BL	SMP	39	6.7 (1.7)	EDU	41	6.6 (2.1)	NA	NA
		12 weeks	SMP	26	7.3 (1.7)	EDU	30	7.1 (2.2)	NR	NR
Ehde, 2015[37]	UW-SES: overall score	BL	SMP	75	45.3 (6.1)	EDU	88	43.4 (7.1)	NA	NR
		9-11 weeks	SMP	75	50.7 (6.9)	EDU	88	47.7 (7.5)	Cohen's d, –0.41 (95% CI, –0.74 to –0.08)	*P* > .05
		24 weeks	SMP	75	50.6 (8.9)	EDU	88	48.3 (8.6)	Cohen's d, –0.27 (95% CI, –0.60 to .07)	*P* > .05
		52 weeks	SMP	75	51.9 (9.1)	EDU	88	48.1 (8.6)	Cohen's d, –0.42 (95% CI, –0.76 to –0.08)	*P* > .05
	PAM: overall score	BL	SMP	75	69.7 (11.4)	EDU	88	67.8 (13.1)	NR	NR
		9–11 weeks	SMP	75	78.8 (10.9)	EDU	88	71.9 (12.7)	Cohen's d, –0.58 (95% CI, –0.92 to –0.23)	*P* < .05
		24 weeks	SMP	75	77.0 (11.9)	EDU	88	73.7 (11.1)	Cohen's d, –0.29 (95% CI, –0.62 to .04)	*P* > .05

AUTHOR, YEAR	OUTCOME[a]	FOLLOW-UP	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN-GROUP	*P* VALUE
			G1	N	ESTIMATE[b]	G2	N	ESTIMATE[b]		
		52 weeks	SMP	75	78.1 (12.0)	EDU	88	73.3 (14.2)	Cohen's d, –0.36 (95% CI, –0.70 to –0.02)	*P* > .05
Fanning, 2022[29]	Self–efficacy for walking	BL	SMP + PA	15	Adj. mean 45.6 (SE, 9.5)	WL	15	Adj. mean, 44.33 (SE, 9.12)	NA	NA
		12 weeks	SMP + PA	15	Adj. mean 59.8 (SE, 8.7)	WL	13	Adj. mean, 43.5 (SE, 8.3)	F = 2.2	*P* = .16
Focht, 2014[44]	SRSE	BL	SMP + PA	33	54.3 (18.1)	PA	31	54.5 (20.2)	NA	NA
		12 weeks	SMP + PA	33	63.5 (18.8)	PA	31	52.5 (20.0)	Cohen's d = 0.63	*P* < .01
		52 weeks	SMP + PA	33	62.3 (16.1)	PA	31	46.9 (22.5)	Cohen's d = 0.95	*P* < .01
	MRSE	BL	SMP + PA	33	73.0 (27.6)	PA	31	70.4 (27.6)	NA	NA
		12 weeks	SMP + PA	33	81.4 (26.3)	PA	31	74.2 (27.1)	Cohen's d = 0.27	*P* = .07
		52 weeks	SMP + PA	33	1.5 (27.1)	PA	31	71.6 (28.3)	Cohen's d = 0.44	*P* = .07
Goode, 2018[43]	CSQ: without catastrophizing	12 weeks	SMP + PA	16	MD, –10.70 (95% CI, –24.6 to 3.10)	WL	15	MD, –5.80 (95% CI, –20.10 to 8.43)	MDIC, –4.9 (95% CI, –24.7 to 14.9)	NR
			SMP + PA	16	MD, –10.70 (95% CI, –24.6 to 3.10)	PA	19	MD, 8.20 (95% CI, –4.86 to 21.24)	MDIC, –18.9 (95% CI, –26.0 to –11.8)	NR
Matthias, 2020[31]	ASES: total score	BL	SMP	119	6.1 (2.2)	EDU	94	6.2 (2.3)	NA	*P* = .56
		24 weeks	SMP	92	6.3 (2.3); MD, 0.23 (95% CI, –0.22 to 0.69)	EDU	86	6.1 (2.1); MD, –0.15 (95% CI, –0.62 to 0.31)	MDIC, 0.39 (95% CI, –0.26 to 1.03)	*P* = .24
		36 weeks	SMP	85	6.4 (2.2); MD, 0.31 (95% CI, –0.16 to 0.77)	EDU	82	6.1 (2.2); MD, –0.20 (95% CI, –0.67 to 0.27)	MDIC, 0.51 (95% CI, –0.16 to 1.17)	*P* = .13
		BL	SMP	119	60.6 (13.5)	EDU	94	57.9 (13.8)	NA	*P* = .16

AUTHOR, YEAR	OUTCOME[a]	FOLLOW-UP	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN-GROUP	*P* VALUE
			G1	N	ESTIMATE[b]	G2	N	ESTIMATE[b]		
	PAM: total score	24 weeks	SMP	92	63.5 (14.9); MD, 3.68 (95% CI, 0.90 to 6.46)*	EDU	86	58.7 (14.3) MD, 0.85 (95% CI, −1.99 to 3.68)	MDIC, 2.84 (95% CI, −1.13 to 6.80)	*P* = .16
		36 weeks	SMP	85	62.8 (14.7); MD, 2.76 (95% CI, −0.09 to 5.61)	EDU	82	60.5 (14.9) MD, 2.94 (95% CI, 0.08 to 5.81)	MDIC, −0.18 (95% CI, −4.22 to 3.86)	*P* = .93
Merlin, 2018[33]	PESQ	16 weeks	SMP	19	MD, 4.2 (17.8)	UC	17	MD, 7.4 (15.4)	NR	*P* = .58
Shadick, 2013[38]	ASES: other symptoms subscale	BL	SMP	38	68.2 (95% CI, 63.1 to 73.4)	EDU	40	77.1 (95% CI, 71.8 to 82.3)	NA	NA
		36 weeks	SMP	38	76.3 (95% CI, 71.3 to 81.2)	EDU	40	73.5 (95% CI, 67.5 to 79.5)	MD, 10.5 (95% CI, 2.6 to 18.5)	*P* = .07
		78 weeks	SMP	38	72.6 (95% CI, 66.8 to 78.3)	EDU	40	74.7 (95% CI, 67.8 to 81.6)	MD, 7.1 (95% CI, −0.3 to 14.5)	*P* = .27
Shigaki, 2013[39]	ASES	46 weeks	SMP	43	84.1 (16.3)	WL	45	68.6 (23.3)	ES, 0.92	*P* < .001
Somers, 2012[41]	ASES	104 weeks	SMP	60	225.7 (95% CI, 217.7 to 233.7)	UC	51	213.0 (95% CI, 204.7 to 221.2)	NR	NR
Sullivan, 2017[35]	PSEQ	BL	SMP	18	30.56 (10.98)	UC	17	31.94 (8.52)	NR	NR
		22 weeks	SMP	16	36.13 (12.21)	UC	15	30.00 (13.87)	Adj. MD, 7.86 (95% CI, 1.22 to 14.50)	*P* = .02
		34 weeks	SMP	16	35.25 (13.92)	UC	16	29.75 (16.64)	Adj. MD, 7.26 (95% CI, −2.14 to 16.66)	*P* = .13

Notes. [a] See Table D3 for measurement scale ranges and interpretation. [b] Estimates are means and standard deviations unless otherwise noted.
Abbreviations. Adj.: adjusted; ASES: Arthritis Self-Efficacy Scale; BL: baseline; CI: confidence interval; CSQ: Coping Strategies Questionnaire; EDU: education; ES: effect size; G1: study group 1; G2: study group 2; MD: mean difference; MDIC: mean difference in change; MRSE: Mobility-Related Self-Efficacy; NA: not applicable; NR: not reported; PA: physical activity; PAM: Patient Activation Measure; PSEQ: Pain Self-Efficacy Questionnaire; SE: standard error; SEMCD: Self-Efficacy to Manage Chronic Disease; SMP: self-management program; SRSE: Self-Regulatory Self-Efficacy; UC: usual care; UW-SES: University of Washington Self-Efficacy Scale; WL: wait-list.

TABLE D7. MEDICATION AND HEALTH RESOURCE USE OUTCOMES, ALL TIMEPOINTS, FOR INCLUDED STUDIES ON SMPs FOR CHRONIC PAIN

AUTHOR, YEAR	OUTCOME	TIME–POINT	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN–GROUP	*P* VALUE
			G1	N	ESTIMATE	G2	N	ESTIMATE		
MEDICATION USE OUTCOMES										
DeBar, 2022[30]	Daily opioid dose, mean MME	12 weeks	SMP	423	46.6; MD, −0.82 (95% CI, −3.1 to +1.4)	UC	413	56.7; MD, 1.44 (95% CI, −0.87 to +3.76)	MDIC, −2.26 (95% CI, −5.51 to +0.99)	NR
		52 weeks	SMP	401	43.5; MD, −3.92 (95% CI, −7.28 to −0.56)	UC	384	53.3; MD, −1.95 (95% CI, −5.38 to 1.47)	MDIC, −1.97 (95% CI, −6.77 to 2.83)	NR
	Patients with mean daily opioid dose ≥ 90 MME	12 weeks	SMP	423	63 of 423 (14.9%); RR, 1.02 (95% CI, 0.91 to 1.13)	UC	413	90 of 413 (21.8%) RR, 1.05 (95% CI, 0.97 to 1.14)	Ratio of RR, 0.97 (95% CI, 0.84 to 1.11)	NR
		52 weeks	SMP	401	44 of 401 (11.0%); RR, 0.95 (95% CI, 0.85 to 1.06)	UC	384	75 of 385 (19.5%) RR, 0.83 (95% CI, 0.71 to 0.96)	Ratio of RR, 0.97 (95% CI, 0.84 to 1.11)	NR
Matthias, 2020[31]	Unique opioids in medical record	36 weeks	SMP	85	0.7 (1.1)	EDU	82	0.6 (0.9)	NR	*P* = .49
Sullivan, 2017[35]	Daily opioid dose, mean MME	BL	SMP	18	207.2 (269.4)	UC	17	245.2 (347.4)	NR	NR
		22 weeks	SMP	16	111.9 (153.6)	UC	15	169.8 (201.3)	Adj. MD, −42.9 (95% CI, −92.4 to 6.6)	*P* = .09
		34 weeks	SMP	16	99.5 (152.0)	UC	16	138.2 (155.9)	Adj. MD −26.7 (95% CI, −83.0 to 29.6)	*P* = .34
	Reduction in opioid dose, mean MME	22 weeks	SMP	16	−0.43 (0.36)	UC	15	−0.19 (0.41)	Adj. MD, −0.25 (95% CI, −0.52 to 0.02)	*P* = .07
		34 weeks	SMP	16	−0.52 (0.34)	UC	16	−0.31 (0.49)	Adj. MD, −0.22 (95% CI, −0.52 to 0.08)	*P* = .14

AUTHOR, YEAR	OUTCOME	TIME–POINT	SMP GROUP(S)			CONTROL GROUP(S)			BETWEEN–GROUP	*P* VALUE
			G1	N	ESTIMATE	G2	N	ESTIMATE		
	PODS opioid problems, mean score	22 weeks	SMP	16	2.94 (3.89)	UC	15	7.53 (6.69)	Adj. MD, −4.90 (95% CI, −8.40 to −0.80)	*P* = .02
		34 weeks	SMP	16	3.44 (5.54)	UC	16	9.25 (10.23)	Adj. MD, −0.22 (95% CI, −0.52 to 0.08)	*P* = .08
	PODS opioid concerns, mean score	22 weeks	SMP	16	10.00 (7.30)	UC	15	11.47 (6.91)	Adj. MD, 0.16 (95% CI, −3.74 to 4.06)	*P* = .93
		34 weeks	SMP	16	10.00 (8.00)	UC	16	10.75 (7.26)	Adj. MD, 1.62 (95% CI, −3.27 to 6.51)	*P* = .50
	POMI, mean score	22 weeks	SMP	16	0.56 (1.03)	UC	15	0.67 (1.11)	Adj. MD, 0.08 (95% CI, −0.58 to 0.75)	*P* = .80
		34 weeks	SMP	16	0.63 (0.96)	UC	16	0.88 (1.09)	Adj. MD, 0.06 (95% CI, −0.45 to 0.57)	*P* = .81
HEALTH RESOURCE USE OUTCOMES										
Matthias, 2020[31]	ED visits	36 weeks	SMP	85	0.6 (1.1)	EDU	82	0.9 (1.8)	NR	*P* = .14
	Hospitalization	36 weeks	SMP	85	0.1 (0.4)	EDU	82	0.2 (0.6)	NR	*P* = .29
	Days in hospital	36 weeks	SMP	85	0.3 (1.2)	EDU	82	0.8 (2.9)	NR	*P* = .19
	Outpatient visits	36 weeks	SMP	85	16.2 (19.5)	EDU	82	15.2 (16.6)	NR	*P* = .66
	Phone and secure messaging	36 weeks	SMP	85	7.6 (11.5)	EDU	82	6.7 (6.8)	NR	*P* = .47

Abbreviations. Adj.: adjusted; BL: baseline; CI: confidence interval; ED: emergency department; EDU: education; G1: group 1; G2: group 2; MD: mean difference; MDIC: mean difference in change; MME: morphine milligram equivalents; NR: not reported; PODS: Prescription Opioid Difficulties Scale; POMI: Prescription Opioid Misuse Index; RR: relative risk; SMP: self-management program; UC: usual care.

Table D8. POTENTIALLY ELIGIBLE ONGOING RCTs OF SMPs FOR ADULTS WITH CHRONIC PAIN

STUDY NUMBER STUDY TITLE	ENROLLMENT FOLLOW-UP SETTING	CHRONIC PAIN CONDITION(S)	SMP DETAILS CONTROL GROUP(S)	RELEVANT OUTCOMES	PRIMARY COMPLETION DATE
NCT03582683[67] A Randomized Controlled Trial of a Community-Based Chronic Pain Self-Management Program in West Virginia	N=196 (actual) 52 weeks Community	Chronic pain and opioid use	**SMP** ■ 6 weekly sessions ■ Group format ■ In-person ■ Trained leader (type not specified) **Wait-list**	■ QoL (pain) ■ QoL (overall) ■ Medication use ■ Health resource use ■ Self-efficacy ■ Depression	April 2021[a] (actual)
NCT03743402[69] Randomized Trial of Telephonic Pain Self-management to Promote Opioid Tapering	N=153 52 weeks Primary care	Chronic pain and opioid use	**SMP** ■ 22 weekly sessions ■ Individual format ■ Telephone and online ■ Clinician-led **Usual care**	■ QoL (pain) ■ Medication use ■ Self-efficacy ■ Depression	January 2022
NCT04248725[68] Efficacy of a Telehealth Pain Self-Management Intervention in Employed Adults with Physical Disability: A Randomized Controlled Trial	N=200 25 weeks Community	Physical disability	**SMP** ■ 10 weekly sessions ■ Individual format ■ Telephone ■ Clinician-led **Wait-list**	■ QoL (pain) ■ Self-efficacy	March 2023
NCT04571619[70] A Randomized Clinical Trial to Evaluate Non-Pharmacologic and Pharmacologic Approaches for Reducing Pain and Opioid Use Among	N=643 36 weeks Specialty	End-stage renal disease and opioid use	**SMP** ■ 24 weekly sessions ■ Individual format ■ Telephone and online ■ Coach-led (type not specified) **Usual care**[b]	■ QoL (pain) ■ QoL (overall) ■ Medication use ■ Health resource use ■ Self-efficacy ■ Depression	September 2023

STUDY NUMBER STUDY TITLE	ENROLLMENT FOLLOW-UP SETTING	CHRONIC PAIN CONDITION(S)	SMP DETAILS CONTROL GROUP(S)	RELEVANT OUTCOMES	PRIMARY COMPLETION DATE
Patients Treated with Maintenance Hemodialysis					
NCT05005416[71] Efficacy of a Culturally Adapted Cognitive Behavioral Based Physical Therapy Intervention for Latinos with Chronic Spine Pain	N=138 26 weeks Primary care	Chronic neck or low back pain	**SMP** ■ 8 weekly sessions ■ Individual format ■ In-person and telephone ■ Clinician-led **Usual care**	■ QoL (pain) ■ QoL (overall) ■ Self-efficacy ■ Depression	February 2024
NCT03698669[72] Treating Chronic Pain in Buprenorphine Patients in Primary Care Settings	N=250 12 weeks Primary care	Chronic pain and opioid use disorder	**SMP** ■ 12 weekly sessions ■ Individual format ■ Telephone ■ Clinician-led **Education** ■ General telephone-based health education; 6 weekly sessions	■ QoL (pain) ■ Depression	May 2024
NCT05127616[73] A Brief, Transdiagnostic Cognitive Behavioral Treatment for Urological Chronic Pelvic Pain Syndrome: Processes, Predictions, Outcomes	N=240 26 weeks Specialty	Urologic chronic pelvic pain syndrome	**SMP** ■ 10 weeks; 4 sessions ■ Individual format ■ Telephone and online ■ Clinician-led **Education** ■ General education about urologic chronic pelvic pain syndrome symptoms and treatment; 4 sessions	■ QoL (pain) ■ QoL (overall) ■ Depression	November 2025

STUDY NUMBER STUDY TITLE	ENROLLMENT FOLLOW-UP SETTING	CHRONIC PAIN CONDITION(S)	SMP DETAILS CONTROL GROUP(S)	RELEVANT OUTCOMES	PRIMARY COMPLETION DATE
NCT05503173[74] Integrated Telehealth Intervention to Reduce Chronic Pain and Unhealthy Drinking Among People Living With HIV	N=385 26 weeks Community	Chronic pain and HIV	**SMP** ■ 12 weekly sessions ■ Individual format ■ Online (videoconferencing) ■ Clinician-led **Education** ■ Brief advice and information	■ QoL (pain)	February 2026
NCT05039554[75] Randomized Trial of Acceptance and Commitment Therapy (ACT) and a Care Management App in Primary Care-based Buprenorphine Treatment	N=280 24 weeks Primary care	Chronic pain and opioid use disorder	**ACT + app (SMP)** ■ 12 weekly sessions ■ Group format ■ In-person and online (mobile app) ■ Clinician-led **ACT alone** **App alone** **Usual care**	■ QoL (pain) ■ QoL (overall) ■ Medication use ■ Depression	July 2027

Note. Table reflects studies registered on ClinicalTrials.gov as of October 2023. [a] According to ClinicalTrials.gov, this trial was completed in April 2021; however, there are no identified publications to date. [b] This study follows a sequential multiple assignment design: following the randomized portion of the study comparing the SMP with usual care, a nonrandomized portion of the study will begin at Week 24 when eligible participants are encouraged to switch from their full agonist opioid medication to buprenorphine.
Abbreviations. ACT: Acceptance and Commitment Therapy; app: (mobile phone) application; QoL: Quality of Life; RCT: randomized controlled trial; SMP: self-management program.

TABLE D9. RECOMMENDED SELF-MANAGEMENT PROGRAM CONTENT FROM CLINICAL PRACTICE GUIDELINES

GUIDELINE (YEAR)	CHRONIC PAIN CONDITION(S)	CBT & COPING SKILLS	DISEASE-SPECIFIC EDUCATION	EFFECTIVE COMMUNICATION	GOAL SETTING	HEALTHY BEHAVIORS	PROBLEM SOLVING & SKILL BUILDING	RELAXATION & STRESS REDUCTION	TREATMENT ADHERENCE
NICE (2021)[79]	General chronic pain	No content recommendations							
Pain Management Best Practices Interagency Task Force (2019)[83]	General chronic pain	X	X				X	X	X
ACR/Arthritis Foundation (2020)[76]	Osteoarthritis		X			X	X		X
OARSI (2019)[80]	Osteoarthritis	No content recommendations							
ACR (2022)[78]	Rheumatoid arthritis	X			X			X	
EULAR (2022)[82]	Difficult-to-treat rheumatoid arthritis	X	X		X			X	
EULAR (2021)[81]	Inflammatory arthritis conditions	X	X	X	X	X	X		X
VA/DoD (2019)[77]	Low back pain	X				X		X	

Abbreviations. ACR: American College of Rheumatology; CBT: cognitive behavioral therapy; DoD: US Department of Defense; EULAR: European Alliance of Associations for Rheumatology; NICE: National Institute of Health and Care Excellence; OARSI: Osteoarthritis Research Society International; VA: US Department of Veterans Affairs.

APPENDIX E. APPLICABLE CODES

TABLE E1. APPLICABLE CODES FOR SELF-MANAGEMENT PROGRAMS FOR CHRONIC PAIN

CODE	DESCRIPTION
ICD-10-CM CODES	
E10.10-E13.9	Diabetes
E66.01-E66.9	Obesity
G35	Multiple sclerosis syndrome
G43.909	Migraine
G89.2-G89.4	Chronic pain syndrome
G89.3	Cancer-related pain (chronic)
I10-I1A.0	Hypertension
I25.10-I25.9	Atherosclerosis and chronic ischemic heart disease
J45.20-J45.998	Asthma
K58	Irritable bowel syndrome
M13.0-M13.89	Arthritis
CPT CODES	
98960	Education and training for patient self-management by a qualified, nonphysician health care professional using a standardized curriculum, face-to-face with the patient (could include caregiver/family); make-up class for 1 patient, each 30 minutes (limit 2 units per service date) Chronic care management services provided personally by a physician or other qualified health care professional for at least 30 minutes
98961	Education and training for patient self-management by a qualified, nonphysician health care professional using a standardized curriculum, face-to-face with the patient (could include caregiver/family) for 2-4 patients, each 30 minutes
98962	Education and training for patient self-management by a qualified, nonphysician health care professional using a standardized curriculum, face-to-face with the patient (could include caregiver/family) for 5-8 patients, each 30 minutes
HCPCS CODES	
G0109	Diabetes outpatient self-management training services, group session (2 or more), per 30 minutes

Abbreviations. CPT: Current Procedural Terminology; HCPCS: Healthcare Common Procedure Coding System; ICD-10-CM: International Classification of Diseases, Tenth Revision, Clinical Modification.