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Original Article

Self-Management Programs for Chronic Non-Cancer Pain: A Rapid Review of Randomized Trials

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ABSTRACT: ***Background:*** The body of evidence regarding self-management programs (SMPs) for adult chronic non-cancer pain (CNCP) is steadily growing, and regular updates are needed for effective decision-making. ***Objectives:*** To systematically identify, critically appraise, and summarize the findings from randomized controlled trials (RCTs) of SMPs for CNCP. ***Methods:*** We searched relevant databases from 2009 to August 2021 and included English-language RCT publications of SMPs compared with usual care for CNCP among adults (18+ years old). The primary outcome was health-related quality of life (HR-QoL). We conducted meta-analysis using an inverse variance, random-effects model and calculated the standardized mean difference (SMD) and associated 95% confidence interval (CI) and statistical heterogeneity using the I^2 statistic. ***Results:*** From 8538 citations, we included 28 RCTs with varying patient populations, standards for SMPs, and usual care. No RCTs were classified as having a low risk of bias. There was no evidence of a significant improvement in overall HR-QoL, irrespective of pain type, immediately post-intervention (SMD 0.01, 95%CI −0.21 to 0.24; I^2 57%; 11 RCTs; 979 participants), 1–4 months post-intervention (SMD 0.02, 95%CI −0.16 to 0.20; I^2 48.7%; 12 RCTs; 1160 participants), and 6–12 months post-intervention (SMD 0.07, 95%CI −0.06 to 0.21; I^2 26.1%; 9 RCTs; 1404 participants). Similar findings were made for physical and mental HR-QoL, and for specific QoL assessment scales (e.g., SF-36). ***Conclusions:*** There is a lack of evidence that SMPs are efficacious for CNCP compared with usual care. Standardization of SMPs for CNCP and better planned/conducted RCTs are needed to confirm these conclusions.

RÉSUMÉ : Programmes d'autogestion de la douleur chronique non cancéreuse : un examen rapide d'essais contrôlés randomisés. ***Contexte :*** Le corpus de preuves concernant les programmes d'autogestion (PAG) de la douleur chronique non cancéreuse (DCNC) chez l'adulte ne cesse de croître. À cet égard, des mises à jour régulières sont nécessaires en vue d'une prise de décision efficace. ***Objectifs :*** Identifier systématiquement, évaluer de manière critique et résumer les résultats d'essais contrôlés randomisés (ECR) des PAG dans le cas de la DCNC. ***Méthodes :*** De 2009 à août 2021, nous avons effectué une recherche dans des bases de données pertinentes et avons inclus des publications en anglais portant sur les ECR des PAG comparés aux soins habituels de la DCNC chez les adultes (18 ans et plus). Le principal résultat observé avait trait à la qualité de vie liée à la santé (QVS). Nous avons ensuite effectué une méta-analyse en utilisant un modèle à effets aléatoires à variance inverse et calculé la différence moyenne standardisée (DMS) et l'intervalle de confiance (IC) à 95 % associé ainsi que l'hétérogénéité statistique en utilisant l'indicateur I^2. ***Résultats :*** Sur 8538 citations, nous avons inclus 28 ECR dont les populations de patients, les critères de PAG et les soins habituels prodigués variaient. Aucun ECR ne présentait à nos yeux un faible risque de biais. De plus, aucune preuve d'une amélioration significative de la qualité de vie globale n'a émergé, et ce, quel que soit le type de douleur et immédiatement après une intervention (DMS 0,01 ; IC 95 % 0,21 à 0,24 ; I^2 57 % ; 11 ECR ; 979 participants) ; de 1 à 4 après une intervention (DMS 0,02 ; IC 95 % 0,16 à 0,20 ; I^2 48,7 % ; 12 ECR ; 1160 participants) ; et de 6 à 12 mois après une intervention (DMS 0,07 ; IC 95 % 0,06 à 0,21 ; I^2 26,1 % ; 9 ECR ; 1404 participants). Des conclusions similaires ont été tirées pour la QVS physique et mentale de même que pour des échelles spécifiques d'évaluation de la QVS (par exemple, le test SF-36). ***Conclusions :*** En somme, on constate un manque de preuves à l'effet que les PAG sont plus efficaces dans le cas de la DCNC si on les compare aux soins habituellement prodigués. La standardisation des PAG pour la DCNC, ainsi que des ECR mieux planifiés et mieux réalisés, sont nécessaires pour confirmer ces conclusions.

Keywords: Adults; Self-management programs; Chronic non-cancer pain; Randomized controlled trials; Rapid review; Meta-analysis

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Key message: Evidence from randomized controlled trials of efficacy of self-management programs for chronic non-cancer pain suggests little to no improvement in overall, physical, or mental health-related quality of life when compared with usual care among adults.

Introduction

The etiology of many chronic pain conditions is often unclear and is mostly multifactorial; characterized by a complex interaction between biological, psychological, and social factors.[1] The World Health Organization International Classification of Diseases 11 (ICD-11) regards pain to be chronic if it lasts or recurs for at least three months, persisting past normal healing time, and lacking acute warning physiological signs, is associated with significant emotional distress and/or functional disability, and not explained by a known condition.[2] Chronic pain affects an estimated 20% of individuals[3,4] and accounts for an estimated 15 to 20% of primary care visits globally.[5] In the United States of America (USA) alone, using the Medical Expenditure Panel Survey, the annual cost of chronic pain was estimated to be as high as $635 billion a year in 2010 dollars, which was more than the annual costs for cancer, heart disease, and diabetes.[6] Chronic pain is therefore of immense public health concern, and estimates suggest a prevalence rate of 5 to 33% for chronic non-cancer pain (CNCP).[7]

Despite substantially high prevalence, associated morbidity, and deleterious impact of chronic pain, the available evidence indicates that chronic pain is mostly undertreated especially among older adults (65+ years old).[8,9] Owing to the enormous cost and adverse side effects of many pharmacological pain management agents,[10] the limited efficacy of standard therapies for chronic pain, and the need to maximize the effectiveness of management regiments,[11] a variety of self-management programs (SMPs) have been proposed and are being developed for the management of chronic pain. Self-management is defined as tasks undertaken by an individual to help them cope and live well with one or more chronic conditions, including motivation of oneself and confidence in dealing with medical, physical, and emotional management of their conditions.[12] Self-management therefore entails informed tasks and actions to manage chronic conditions effectively. SMPs for CNCP vary in composition but typically include combinations of pain education, tailored exercises, mind and body relaxation, cognitive coping, problem-solving, and communication skills training.[13] They also can differ with respect to the mode of delivery (individual or group-based) and duration.

In view of the accumulating evidence and varied conclusions from studies of SMPs for CNCP in adults, we systematically identified, critically appraised, and summarized the findings from randomized controlled trials (RCTs) that compared the efficacy of SMPs for CNCP against usual care, focusing on health-related quality of life (HR-QoL).

Methods

We conducted this rapid systematic review as part of a Systematic Prospective Assessment of Rapid Knowledge Synthesis (SPARKS) project (https://osf.io/fnx36/), and the review was registered with the Open Science Framework (registration: osf.io/tzje2) prior to commencement. The review was conducted in accordance with the World Health Organization guidelines for rapid reviews,[14] and we reported the findings following the Preferred Reporting Items for Systematic Reviews and Meta-analysis guidelines.[15] A knowledge synthesis librarian (NA) designed a literature search strategy for Medline (Ovid), and another librarian peer reviewed the search strategy using the Peer Review of Electronic Search Strategies (PRESS) checklist.[16] The revised search strategy (Appendix 1) was adapted for Embase (Ovid) and Cochrane (CENTRAL) (Ovid). The literature search was first conducted in March 2019 with the search limited to articles published since 2009 in the English language. While the decision to limit to articles published since 2009 was part of the SPARKS methodology of limiting literature to within the last 10 years, it also enabled concentration on more recent SMPs for CNCP as SMPs protocols are still evolving. The searches were updated in August 2021.

We evaluated the comparative efficacy of SMPs compared with usual care in improving HR-QoL in adults (18+ years old) with CNCP (ICD-11), focusing on English-language publications of RCTs. Trial participants were individuals with CNCP recurring for more than 3 consecutive months. We excluded studies on individuals with chronic cancer-related pain. A SMP must have a reflexive component and addresses an individual's ability to manage their condition. We included SMPs irrespective of administration modalities, types, and duration. We excluded SMPs that are just educational programs or peer-support groups. Usual care included any educational programs or peer-support groups. The primary outcome was HR-QoL.

Retrieved citations from the literature searches were screened by one reviewer. We documented the number of ineligible citations at the title/abstract screening stage and both the number and reasons for ineligibility at the full-text article screening stage. The reviewer scanned references of all included full-text articles for potential RCTs for inclusion. The reviewer also extracted data from the included RCTs and assessed risk of bias using the Cochrane tool for risk of bias assessment in RCTs.[17] Another reviewer checked the extracted data and risk of bias assessments for errors. The two reviewers resolved any discrepancies through discussions or involvement of another reviewer.

The characteristics of the included RCTs and the risk of bias assessments are presented descriptively and in tabular form. To account for different scale measurements of the outcome and potential differences in implementation of scales across RCTs, where appropriate (at least two contributing RCT results), we conducted meta-analysis using an inverse variance, random-effects model and calculated the standardized mean difference (SMD) and associated 95% confidence interval (CI). We assessed and quantified statistical heterogeneity between pooled results using the I^2 statistic.[18] Where appropriate (at least ten contributing RCT results), publication bias was assessed using the Egger's regression test.[19] All statistical analyses were implemented in STATA (version 13; Stata Corp. LP, College Station, TX).

Results

From a total of 8,538 retrieved citations, 28 RCTs (29 publications) [20–48] met the eligibility criteria (Figure 1). Relevant characteristics of the RCTs are summarized in Table 1 and Appendix 2. There were five RCTs from Spain,[22,32,36,40,46] four RCTs from each of

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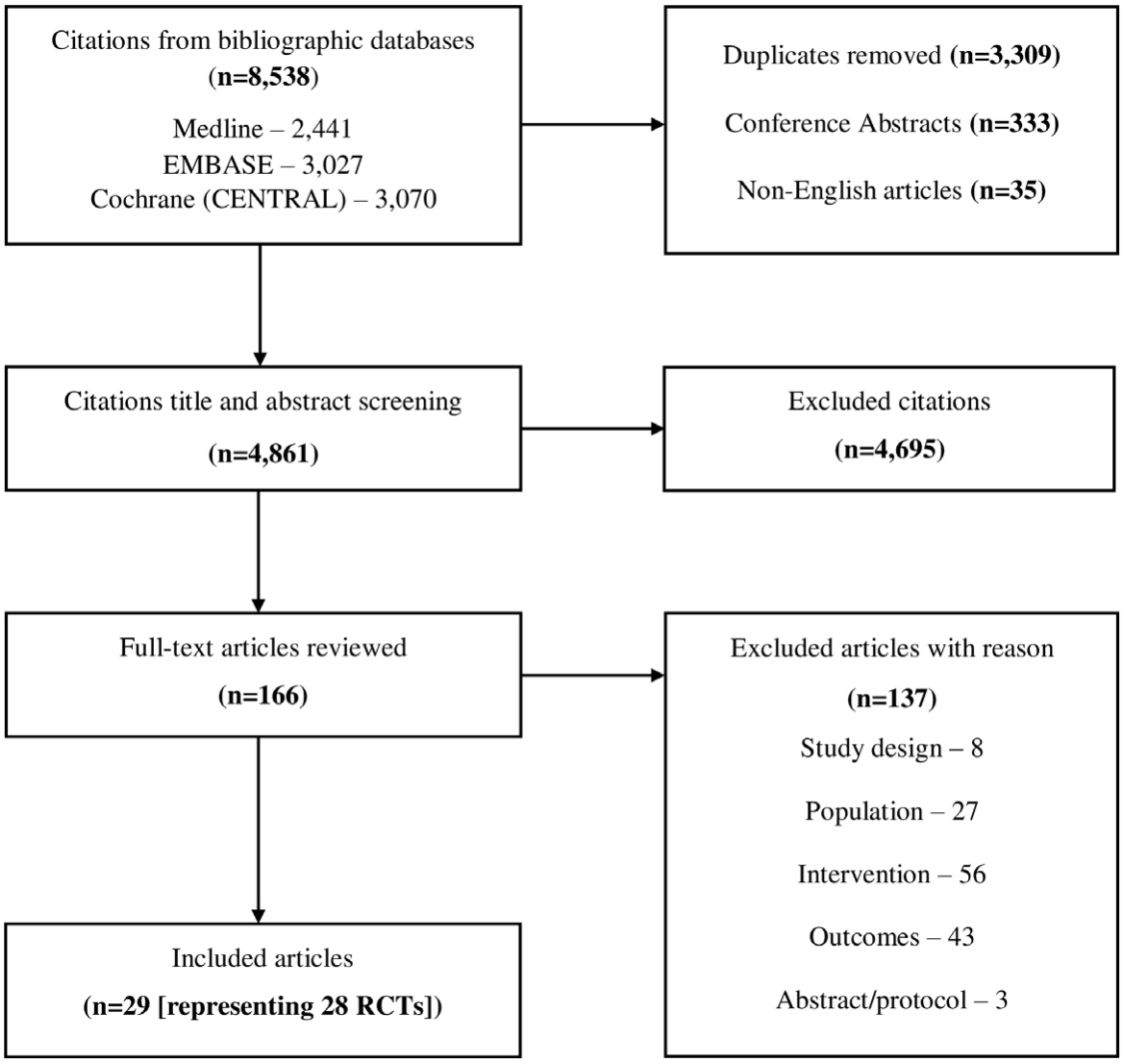

Figure 1: Summary of literature search and screening process (modified PRISMA flowchart).

Australia,[20,23,29,43] China,[27,33,47,48] and the USA,[21,26,28,41] two RCTs from each of Canada,[25,34] Norway,[30,44,45] Portugal,[38,39] and the United Kingdom,[35,37] and one RCT from each of India,[24] the Netherlands,[31] and Switzerland[42]. Participants' inclusion criteria varied across the RCTs especially regarding patient characteristics, pain type, and pharmacological treatments that participants were allowed to be on, or may have received, during the course of the RCTs. The number of participants varied across the RCTs, ranging from 8 to 282. None of the RCTs was funded by industry; 22 RCTs were funded by non-industry sources while six RCTs received no funding.

The compositions of SMPs examined in the RCTs varied and were mostly focused on a pain type and included pain coping skills, activity management, healthy living, goal setting, and stress reduction. However, they were comparable in terms of their overarching types, and the associated usual care comparators were mainly educational or daily activities. There was however substantial variability in the method of application of the SMPs. Duration of intervention ranged from 4 weeks to 12 months. Follow-up after completion of the intervention ranged from one to 12 months.

Ten measurement scales for HR-QoL were identified. These were the AQoL (assessment of quality of life scale),[20,23,43] EQ-5D (Euro quality of life 5 dimensions scale),[22,30,34,36,39,44–46] FIQR (revised fibromyalgia impact questionnaire),[32] KOOS-QoL (Knee injury and osteoarthritis outcome score for quality of life),[38] QLI-Sp (Spanish version of quality of life index scale),[40] RAQoL (rheumatoid arthritis quality of life scale),[37] SF-6D (Short-Form Health Survey 6 Scale),[27] SF-12 (Short-Form Health Survey 12 Scale),[21,25,26,31,47] SF-36 (Short-Form Health Survey 36 Scale),[24,28,29,33,35,41,48] and WHOQOL-BREF (World Health Organization quality of life)[42]. None of the RCTs was judged to be at a low risk of bias (Figure 2).

Meta-analysis of SMPs Compared with Usual Care for Overall HR-QoL

There was no evidence of a significant improvement in overall HR-QoL immediately post-intervention (SMD 0.01, 95% CI −0.21 to 0.24; I^2 57%; 11 RCTs; Egger's test p 0.21; 979 participants), one to four months post-intervention (SMD 0.02, 95% CI −0.16 to 0.20; I^2 48.7%; 12 RCTs; Egger's test p 0.41; 1,160 participants), and six to

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Table 1: Summary characteristics of the included RCTs

Study (country)	Pain type (no. of participants)	Intervention type (no. of randomized) [male percentage]	Control type (no. of randomized) [male percentage]	Intervention duration	Outcome measures (outcome measurement tool)
Ackerman 2012[20] (Australia)	Chronic hip and knee osteoarthritis pain (120 participants)	Arthritis self-management program (58 participants) [38%]	Educational (62 participants) [42%]	6 weeks	3 months and 6 months post-intervention (AQoL)
Allen 2019[21] (USA)	Osteoarthritis pain (248 participants)	A culturally tailored pain coping skills training program (124 participants) [50.8%]	Waitlist (124 participants) [50.8%]	12 weeks	Immediately and 6 months post-intervention (SF-12)
Ariza-Mateos 2020[22] (Spain)	Chronic pelvic pain (44 participants)	Patient-centered intervention that involved patient-proposed activities (22 participants) [NR]	Advice in the form of a leaflet, and usual activities (22 participants) [NR]	6 weeks	Immediately post-intervention [including mental component] (EuroQol-5D)
Bennell 2016[23] (Australia)	Chronic knee osteoarthritis pain (222 participants)	Pain coping skills training and exercise (73 participants) [40%]	Exercise (75 participants) [41%]	12 weeks	Immediately, 8 months and 12 months post-intervention (AQoL-6D)
Bhatia 2020[24] (India)	Chronic pain after total knee replacement (30 participants)	Biopsychosocial model-based rehabilitation (pain coping skill training) and the standard rehabilitation protocol (15 participants) [NR]	Standard rehabilitation protocol focusing on the range of motion and strength training for the operated knee (15 participants) [NR]	4 weeks	Immediately post-intervention [physical and mental component] (SF-36)
Bourgault 2015[25] (Canada)	Fibromyalgia pain (58 participants)	Multicomponent interdisciplinary group intervention (29 participants) [7.1%]	Waitlist (29 participants) [7.1%]	11 weeks	Immediately and 3 months post-intervention [physical and mental component] (SF-12 version 2)
Cederbom 2019[26] (USA)	Chronic musculoskeletal pain (105 participants)	An individually tailored behavioral medicine approach in physical therapy (52 participants) [7.7%]	Recommendation about physical activity (53 participants) [7%]	12 weeks	Immediately and 3 months post-intervention (SF-12)
Cheung 2020[27] (Hong Kong, China)	Knee osteoarthritis pain (35 participants)	Self-administered acupressure training sessions (17 participants) [17.65%]	Knee health education (18 participants) [27.78%]	6 weeks	Immediately post-intervention (SF-6D)
Fanning 2021[28] (USA)	Obese older adults with chronic pain (28 participants)	Weight loss, mindful awareness and frequent bouts of movement (15 participants) [13.3%]	Waitlist (13 participants) [30.8%]	12 weeks	3 months post-intervention (SF-36)
Gardner 2019[29] (Australia)	Chronic low back pain (75 participants)	Patient-led goal setting (37 participants) [51.4%]	Standardized advice to exercise (38 participants) [34.2%]	2 months	Immediately, 4 months and 12 months post-intervention (SF-36)
Haugmark 2021[30] (Norway)	Fibromyalgia (170 participants)	Mindfulness-based and acceptance-based group program followed by physical activity counseling (patient education) session [85 participants]	Patient education session [85 participants]	12 months	3 months and 12 months post-intervention (EQ-5D-5L)

(*Continued*)

Table 1: (*Continued*)

Study (country)	Pain type (no. of participants)	Intervention type (no. of randomized) [male percentage]	Control type (no. of randomized) [male percentage]	Intervention duration	Outcome measures (outcome measurement tool)
Hutting 2015[31] (Netherlands)	Chronic arm, neck, or shoulder pain (123 participants)	Group sessions, targeted education, target setting and action planning (64 participants) [17.2%]	Usual care (53 participants) [32.1%]	6 weeks	3 months, 6 months and12 months post-intervention [all mental component] (SF-12 version 2)
Izquierdo-Alventosa 2020[32] (Spain)	Fibromyalgia (32 participants)	Low intensity physical exercise program combining endurance training and coordination (16 participants) [NR]	No intervention but were asked to perform daily routines (16 participants) [NR]	8 weeks	Immediately post-intervention (Spanish validated version of the Revised Fibromyalgia Impact Questionnaire (FIQR))
Kwok 2016[33] (Hong Kong, China)	Chronic musculoskeletal knee pain (46 participants)	Evidence-based self-management (19 participants) [NR]	Educational (27 participants) [NR]	6 weeks	Immediately post-intervention to General and physical health (Chinese version of SF-36)
Lang 2021[34] (Canada)	Chronic low back pain (174 participants)	Clinician guided, pedometer-driven, walking intervention (117 participants) [42.2%]	Education and advice (57 participants) [35.1%]	12 weeks	3, 6 and 12 months post-intervention (EQ-5D-5L)
Littlewood 2014[35] (United Kingdom)	Chronic rotator cuff tendinopathy pain (24 participants)	Self-managed loaded exercise (12 participants) [42%]	Usual physiotherapy treatment (12 participants) [58%]	Not clear	3 months post-intervention [physical component] (SF-36)
López-López 2021[36] (Spain)	Chronic neck pain (53 participants)	Individualized self-management with physical therapy Intervention (27 participants) [Not reported]	Physical therapy Intervention (26 participants) [Not reported]	4 weeks	Immediately and 3 months post-intervention (EQ-5D-5L)
Manning 2014[37] (United Kingdom)	Rheumatoid arthritis pain (108 participants)	EXTRA self-management program (education and exercise) (52 participants) [15.4%]	Usual care (56 participants) [32.1%]	12 weeks	3 months and 9 months post-intervention (RAQoL)
Marconcin 2018[38] (Portugal)	Knee osteoarthritis pain (80 participants)	Self-management and exercise program (35 participants) [20%]	Educational intervention (32 participants) [40.6%]	12 weeks	Immediately post-intervention (KOOS-QOL)
Marconcin 2021[39] (Portugal)	Knee osteoarthritis pain (80 participants)	Self-management and exercise program (35 participants) [20%]	Educational intervention (32 participants) [40.6%]	12 weeks	3 months post-intervention (EQ-5D-5L)
Molinari 2018[40] (Spain)	Fibromyalgia pain (80 participants)	Patient-led goal setting and imagery exercise (40 participants) [0%]	Daily activities (40 participants) [0%]	Not clear	Immediately, 1 month and 3 months post-intervention (QLI-Sp)
Morone 2016[41] (USA)	Chronic low back pain (282 participants)	Mindfulness based stress reduction program (140 participants) [33.6%]	Educational (142 participants) [33.8%]	8 weeks	Immediately and 6 months post-intervention (SF-36)
Muller 2020[42] (Switzerland)	Chronic pain secondary to a spinal cord injury (168 participants)	Personalized positive psychology exercises (87 participants) [64.4%]	Mindfulness of life activities/events (81 participants) [64.2%]	8 weeks	Immediately and 3 months post-intervention (WHOQOL-BREF)

Nelligan 2021[43] (Australia)	Knee osteoarthritis pain (206 participants)	Knee exercise website plus automated text messages (103 participants) [42%]	Knee education website (103 participants) [36%]	24 weeks		24 weeks post-intervention (AQoL)
Nost 2018[44,45] (Norway)	Chronic pain (121 participants)	Group-based self-management skills (60 participants) [11.7%]	Low-impact, outdoor physical activity (61 participants) [13.1%]	6 weeks		3 months, 6 months, and 12 months post-intervention (EQ-5D-5L)
Rodriguez-Torres 2020[46] (Spain)	Chronic Pelvic Pain (38 participants)	Individualized comprehensive rehabilitation program involving face-to-face physical therapy sessions (19 participants) [NR]	A leaflet with ergonomic information (19 participants) [NR]	8 weeks		Immediately and 3 months post-intervention [including mental component] (EQ-5D)
Sit 2021[47] (Hong Kong, China)	Chronic musculoskeletal Pain (72 participants)	A supervised neuromuscular exercise program (36 participants) [5.6%]	Waitlist (36 participants) [8.3%]	12 weeks		6 weeks and 12 weeks post-intervention [physical and mental component] (SF-12)
Yang 2019[48] (Hong Kong, China)	Chronic low back pain (8 participants)	Self-management exercise plus physiotherapy (5 participants) [80%]	Physiotherapy (3 participants) [0%]	4 weeks		Immediately post-intervention (SF-36)

AQoL = assessment of quality of life scale; EQ-5D = Euro quality of life 5 dimensions scale; FIQR = revised fibromyalgia impact questionnaire; KOOS-QoL = Knee injury and osteoarthritis outcome score for quality of life; QLI-Sp = Spanish version of quality of life index scale; RAQoL = rheumatoid arthritis quality of life scale; SF-6D = Short-Form Health Survey 6 Scale; SF-12 = Short-Form Health Survey 12 Scale; SF-36 = Short-Form Health Survey 36 Scale; WHOQOL-BREF = World Health Organization quality of life; NR = not reported.

twelve months post-intervention (SMD 0.07, 95% CI −0.06 to 0.21; I^2 26.1%; 9 RCTs; 1404 participants) with SMPs compared with usual care (Figure 3). There was no evidence of a significant improvement in overall HR-QoL immediately post-intervention among individuals with fibromyalgia, knee osteoarthritis pain, and low back pain (Appendix 3); one to four months post-intervention among individuals with fibromyalgia, low back pain, and pelvic pain (Appendix 4); and 6 to 12 months post-intervention among individuals with knee pain and low back pain (Appendix 5).

Meta-analysis of SMPs Compared with Usual Care for Physical HR-QoL

There was no evidence of a significant improvement in physical HR-QoL immediately post-intervention (SMD −0.07, 95% CI −0.55 to 0.42; I^2 79.5%; 6 RCTs; 495 participants), one to three months post-intervention (SMD 0.29, 95% CI −0.04 to 0.61; I^2 63.7%; 7 RCTs; 457 participants), and six to twelve months post-intervention (SMD −0.02, 95% CI −0.23 to 0.19; I^2 0%; 2 RCTs; 365 participants) with SMPs compared with usual care (Figure 4). There was a paucity of data to enable stratified analysis by pain type and further exploration of the observed high heterogeneity in the pooled analyses.

Meta-analysis of SMPs Compared with Usual Care for Mental HR-QoL

There was no evidence of a significant improvement in mental HR-QoL immediately post-intervention (SMD 0.14, 95% CI −0.04 to 0.32; I^2 0%; 6 RCTs; 487 participants), one to three months post-intervention (SMD −0.16, 95% CI −0.45 to 0.13; I^2 53.7%; 6 RCTs; 434 participants), and six to twelve months post-intervention (SMD 0.13, 95% −0.08 to 0.34; I^2 0%; 2 RCTs; 365 participants) with SMPs compared with usual care (Figure 5). There was a paucity of data to enable stratified analysis by pain type and further exploration of the observed high heterogeneity in the pooled analysis for one to three months post-intervention.

Meta-analysis of SMPs Compared with Usual Care by HR-QoL Measurement Scale

There was no evidence of a significant improvement in overall, physical or mental HR-QoL except for a marginally significant improvement in overall HR-QoL immediately post-intervention measured using the SF-36 (SMD 0.31, 95% CI 0.01 to 0.61; I^2 32.8%; 4 RCTs; 411 participants) and in mental HR-QoL one to three months post-intervention measured using the EQ-5D scale (SMD −0.64, 95% CI −1.08 to −0.19; I^2 0%; 2 RCTs; 82 participants) (Table 2).

Discussion

We conducted a rapid review to summarize the evidence from RCTs of SMPs compared with usual care for CNCP in adults. We found no evidence of a significant improvement in overall HR-QoL irrespective of pain type nor in physical and mental HR-QoL with SMPs compared with usual care among adults irrespective of SMP intervention duration and the duration of follow-up prior to assessment. While our findings provide some insights into the efficacy of SMPs for HR-QoL in adult individuals with CNCP, we advise cautious interpretation of the findings as the SMPs and the comparator usual care differed substantially and

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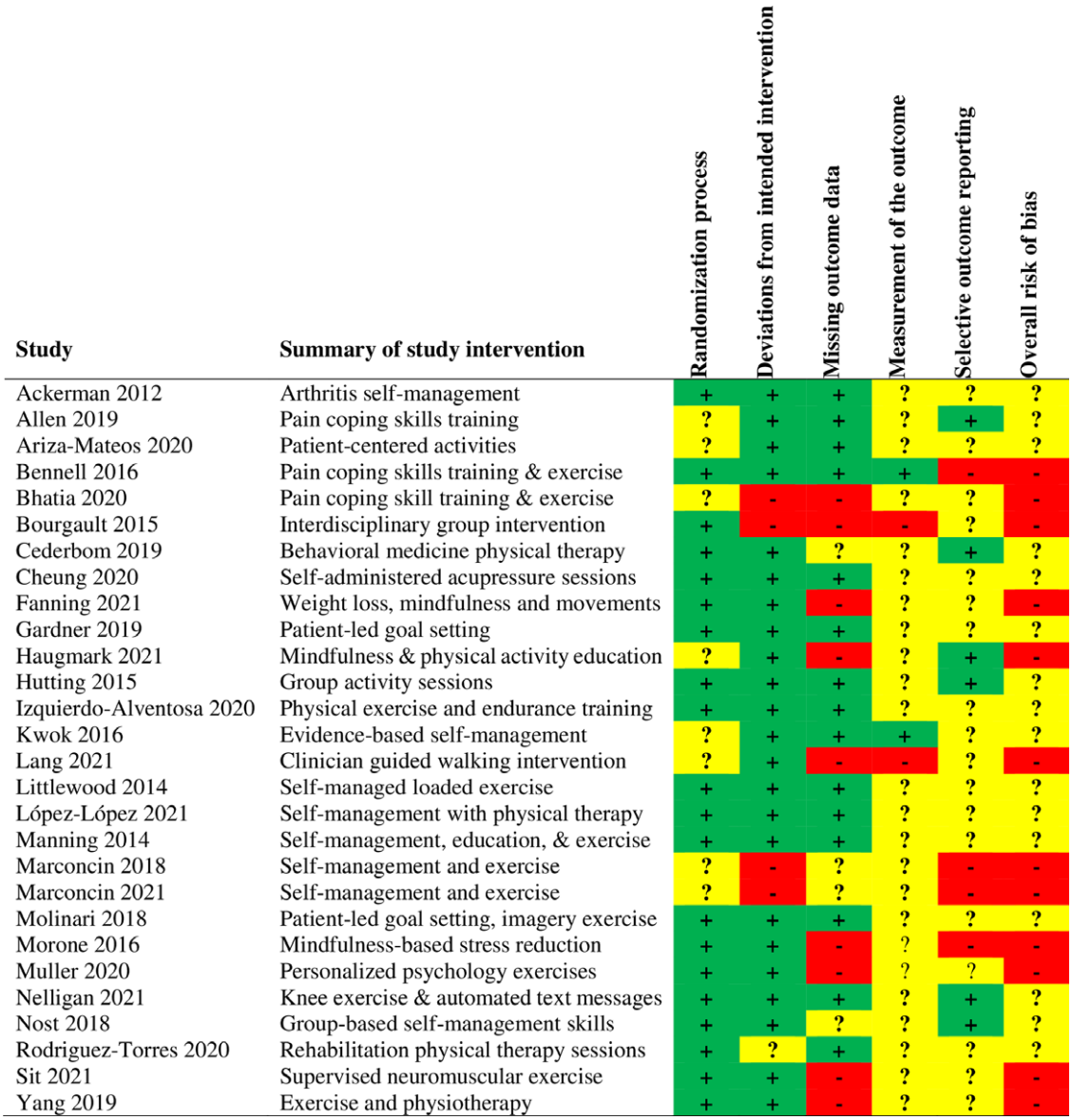

Study	Summary of study intervention	Randomization process	Deviations from intended intervention	Missing outcome data	Measurement of the outcome	Selective outcome reporting	Overall risk of bias
Ackerman 2012	Arthritis self-management	+	+	+	?	?	?
Allen 2019	Pain coping skills training	?	+	+	?	+	?
Ariza-Mateos 2020	Patient-centered activities	?	+	+	?	?	?
Bennell 2016	Pain coping skills training & exercise	+	+	+	+	-	-
Bhatia 2020	Pain coping skill training & exercise	?	-	-	?	?	-
Bourgault 2015	Interdisciplinary group intervention	+	-	-	-	?	-
Cederbom 2019	Behavioral medicine physical therapy	+	+	?	?	+	?
Cheung 2020	Self-administered acupressure sessions	+	+	+	?	?	?
Fanning 2021	Weight loss, mindfulness and movements	+	+	-	?	?	-
Gardner 2019	Patient-led goal setting	+	+	+	?	?	?
Haugmark 2021	Mindfulness & physical activity education	?	+	-	?	+	-
Hutting 2015	Group activity sessions	+	+	+	?	+	?
Izquierdo-Alventosa 2020	Physical exercise and endurance training	+	+	+	?	?	?
Kwok 2016	Evidence-based self-management	?	+	+	+	?	?
Lang 2021	Clinician guided walking intervention	?	+	-	-	?	-
Littlewood 2014	Self-managed loaded exercise	+	+	+	?	?	?
López-López 2021	Self-management with physical therapy	+	+	+	?	?	?
Manning 2014	Self-management, education, & exercise	+	+	+	?	?	?
Marconcin 2018	Self-management and exercise	?	-	?	?	-	-
Marconcin 2021	Self-management and exercise	?	-	?	?	-	-
Molinari 2018	Patient-led goal setting, imagery exercise	+	+	+	?	?	?
Morone 2016	Mindfulness-based stress reduction	+	+	-	?	-	-
Muller 2020	Personalized psychology exercises	+	+	-	?	?	-
Nelligan 2021	Knee exercise & automated text messages	+	+	+	?	+	?
Nost 2018	Group-based self-management skills	+	+	?	?	+	?
Rodriguez-Torres 2020	Rehabilitation physical therapy sessions	+	?	+	?	?	?
Sit 2021	Supervised neuromuscular exercise	+	+	-	?	?	-
Yang 2019	Exercise and physiotherapy	+	+	-	?	?	-

Figure 2: Risk of bias assessment of the included RCTs. RCTs = randomized controlled trials.

participants' inclusion criteria varied across the RCTs, in particular, regarding patient characteristics, pain type, and pharmacological treatments that participants may have received during the course of the RCTs, including medication use and adherence. Further, other chronic diseases from which the study participants may also be suffering may have differed across the RCT populations. Moreover, all included RCTs were classified as having some concerns or at high risk of bias.

The general notion is that SMPs are likely effective for CNCP especially in targeted specific (homogeneous) patient populations. While the assessed pain was mostly of musculoskeletal type in most of the included RCTs, we found no evidence of significant improvement in overall HR-QoL among patients with fibromyalgia, knee pain, low back pain, and pelvic pain. While we were unable to compare the efficacy of SMPs in subpopulations (e.g., by gender, age, opioid use) and to explore the influence of characteristics of the included RCTs on the pooled effect estimates due to a lack of data, the observed non-significant improvement in HR-QoL for SMPs when compared with usual care in adults with CNCP may be due to the differences and a lack of uniformity in the compositions and applications of SMPs. This is likely made worse by variability in the characteristics of the included RCTs and adherence (compliance) to SMPs by participants across the RCTs. It was difficult to determine a specific SMP or a stand-alone approach to an SMP from this review. It was also difficult to assess the true efficacy of the SMPs, considering their differing composite nature and a lack of a standard definition. While factors that may predict HR-QoL outcomes in CNCP using SMPs are not yet established, various strategies to enhance an individual's ability to manage their chronic health condition to support efficacy of SMPs in

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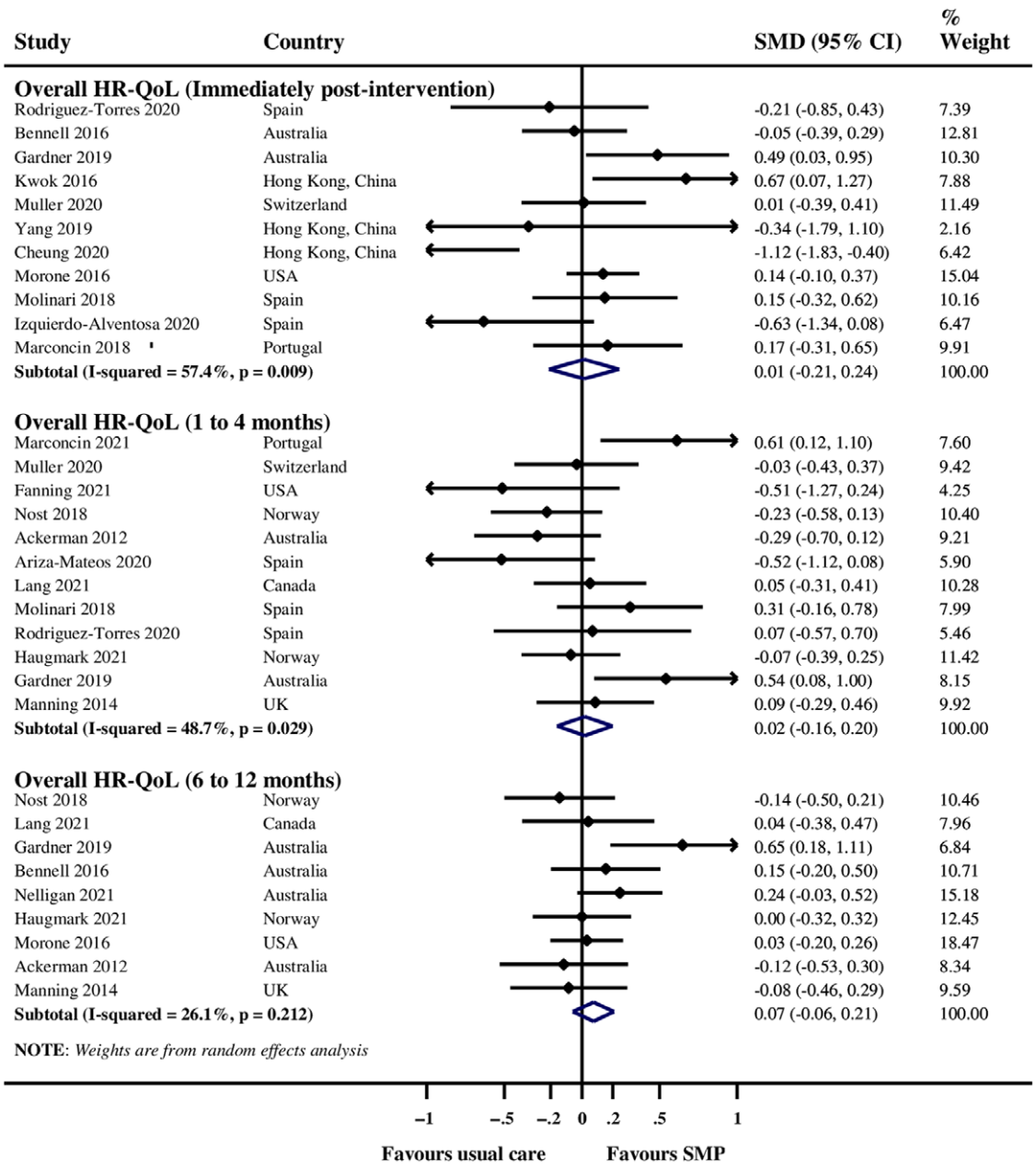

Figure 3: Meta-analysis of SMPs compared with usual care for overall HR-QoL. SMD = D standardized mean difference; SMP = self-management program; HR-QoL = health-related quality of life.

chronic conditions have been proposed by the Registered Nurses' Association of Ontario (RNAO), with recommendation of nurses involvement throughout care and that nurses establish a written agenda for appointments in collaboration with individuals and family and that this may include review of clinical data, experiences with SMP, medication, barriers and stressors, and action planning and continued education.[49] RNAO argues that with the use of SMPs, individuals need to work in collaboration with nurses and other healthcare professionals and assume greater responsibility for healthcare decisions.[49] Such an approach, particularly identification and removal of barriers and stressors, may improve HR-QoL with use of SMPs in CNCP.

While there is a substantial number of published systematic reviews on SMPs for varied CNCP,[50–52] summary of the evidence regarding HR-QoL is lacking. A review by Mann and colleagues of SMPs for chronic pain that met Lorig and Holman's definition of SMPs[53] concluded that SMPs are efficacious in improving mental health and HR-QoL outcomes in individuals with chronic pain.[54] However, this was a descriptive review, and as such, not appropriate for determining efficacy. Another review by Turk and colleagues considered integrated interdisciplinary rehabilitation programs with cognitive restructuring with an emphasis on promotion of self-management, self-efficacy, resourcefulness, and activity versus passivity, reactivity, dependency, and

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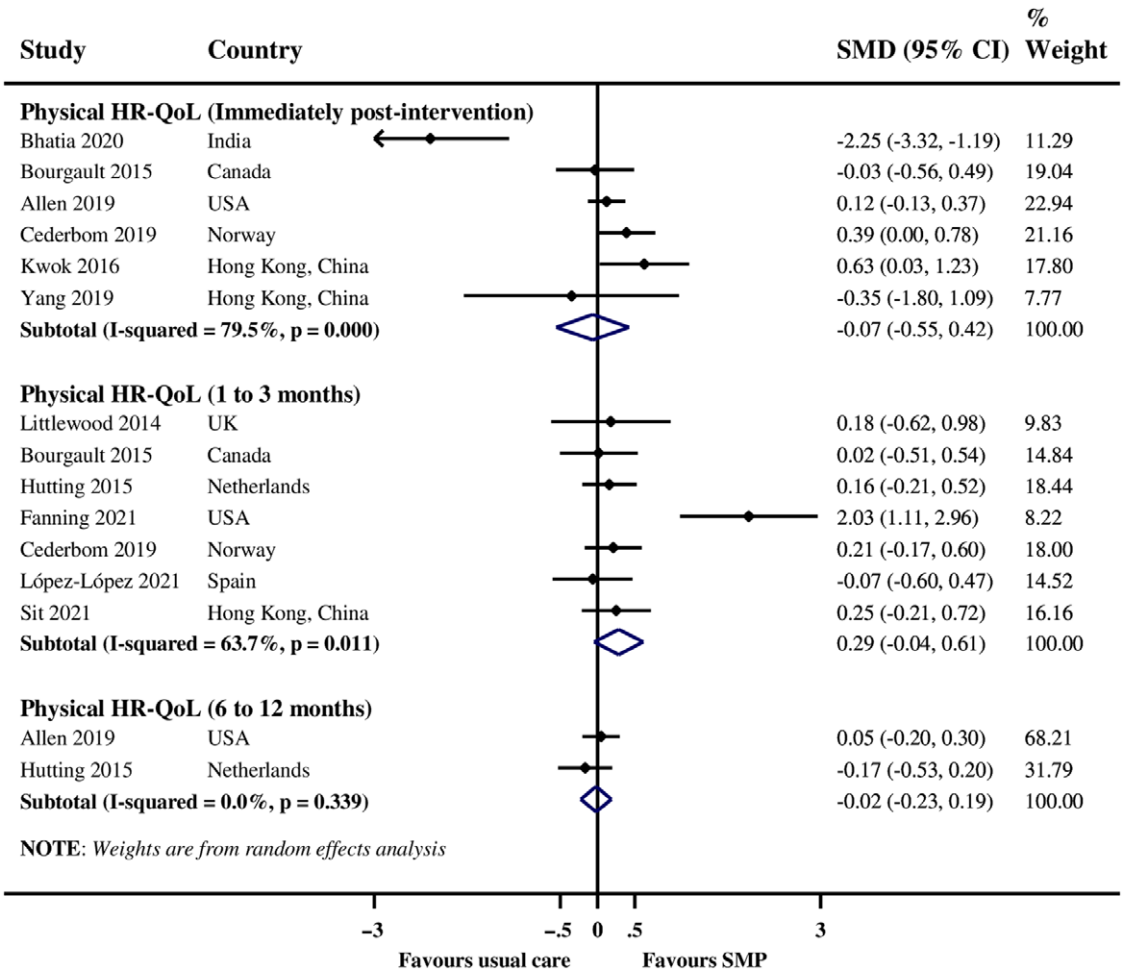

Figure 4: Meta-analysis of SMPs compared with usual care for physical HR-QoL. SMD = D standardized mean difference; SMP = self-management program; HR-QoL = health-related quality of life.

hopelessness.[55] The authors concluded that the available interventions provided minimum improvements in physical and emotional functioning. However, this was also a descriptive review and not appropriate for determining efficacy. Further, Guzman and colleagues assessed the efficacy of outpatient psychophysical treatments from RCTs of patients with disabling chronic low back pain, and while the authors reported that a few RCTs assessed the effect on quality of life, they concluded that less intensive outpatient psychophysical treatments did not improve pain, function, or vocational outcomes when compared with non-multidisciplinary outpatient therapy or usual care.[56]

We searched a limited number of bibliographic databases given that this was a rapid review although conducted systematically, and while it is possible that we may have missed potentially relevant RCTs as a result, we searched the three main bibliographic databases that are highly relevant to the review topic, and we carefully negotiated efficiencies into our approach. However, we included only English-language publications and therefore may have missed some relevant non-English publications. In keeping with rapid review expectations, only one reviewer selected studies for inclusion in the review, which poses the potential for erroneous omission and selection bias, although this process was conducted by an experienced reviewer. Nevertheless, the reviewer scanned references of all included full-text articles for potential RCTs for inclusion, and while only the reviewer extracted data and assessed risk of bias of the included RCTs, another reviewer checked the extracted data and risk of bias assessments for errors. Notwithstanding these potential limitations, the search strategies employed in this rapid review were developed by a highly skilled knowledge synthesis librarian and peer reviewed by another skilled knowledge synthesis librarian using the PRESS checklist. This approach strengthened the appropriate identification of potential literature for inclusion. Our findings answer important clinical questions that may be of help to clinicians in considering SMPs for CNCP and making informed CNCP management decisions for their patients.

Conclusions

There is a lack of evidence from RCTs that SMPs are efficacious in improving overall, physical, and mental HR-QoL in adult individuals with CNCP compared with usual care. A lack of

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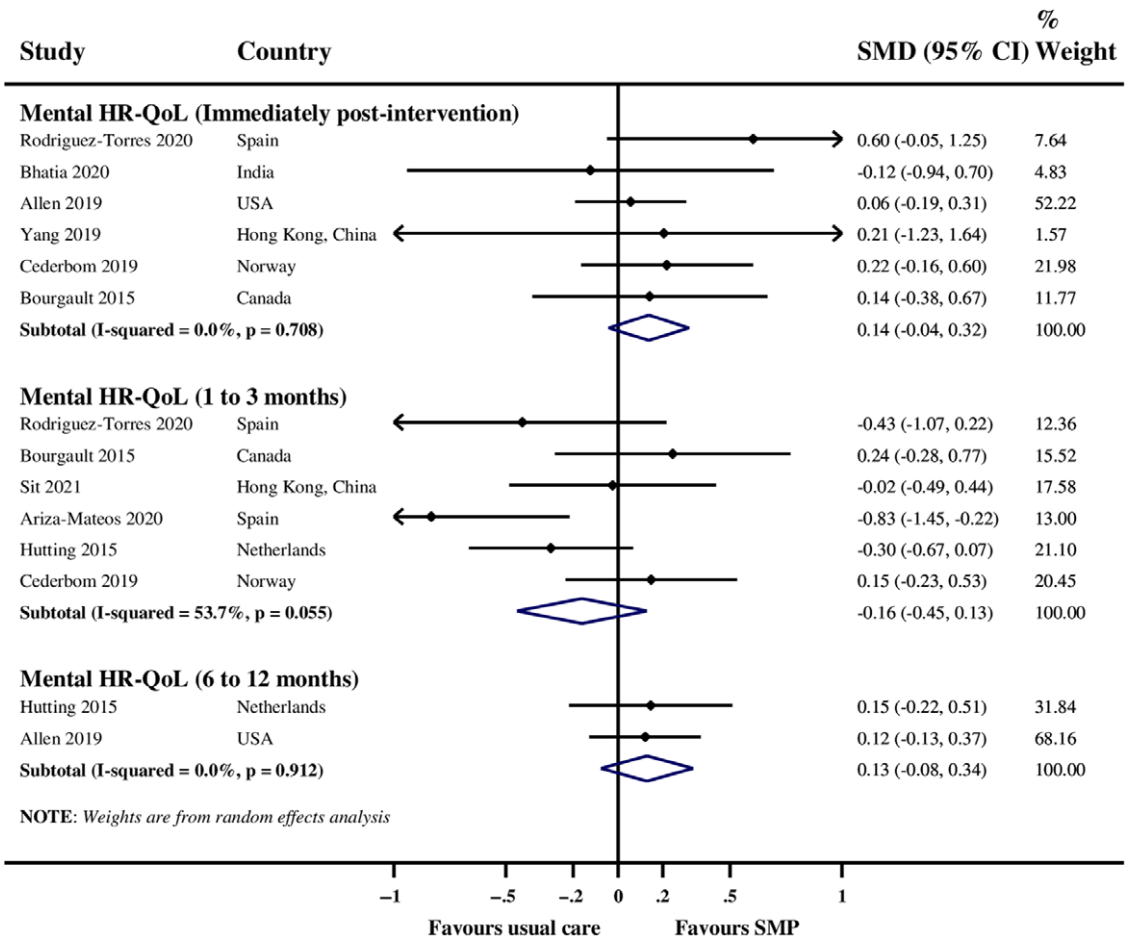

Figure 5: Meta-analysis of SMPs compared with usual care for mental HR-QoL. SMD = D standardized mean difference; SMP = self-management program; HR-QoL = health-related quality of life.

uniformity in the composition and application of SMPs and in the compared usual care require that future research should focus on standardization of SMPs for CNCP and adopting uniformity in the usual care comparator. Further, the risk of bias concerns across the available body of evidence require that better planned/conducted RCTs are needed to confirm the conclusions from this present review. Future research should also consider exploring the administrative and health systems supports that may be needed to support the delivery of SMPs as the knowledge may enhance the efficacy of SMPs for CNCP.

Supplementary material. For supplementary material accompanying this paper visit https://doi.org/10.1017/cjn.2022.261

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Submission Declaration. The authors declare that this work has not been published previously, that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere including electronically in the same form, in English or in any other language, without the written consent of the copyright holder.

Table 2: Meta-analysis of SMPs compared with usual care for HR-QoL by measurement scale type

Outcome	Measurement scale	No. of studies	Population size (participants)	Standardized mean difference (95% CI)	I^2 Statistic (%)
Overall HR-QoL immediately post-intervention	AQoL	1	148	−0.05 (−0.39 to 0.29)	–
	EQ-5D	1	38	−0.21 (−0.85 to 0.43)	–
	FIQR	1	32	−0.63 (−1.34 to 0.08)	–
	KOOS-QoL	1	67	0.17 (−0.31 to 0.65)	–
	QLI-Sp	1	80	0.15 (−0.32 to 0.62)	–
	SF-6D	1	35	−1.12 (−1.83 to −0.40)	–
	SF-36	4	411	**0.31 (0.01 to 0.61)**	32.8
	WHOQOL-BREF	1	168	0.01 (−0.39 to 0.41)	–
Overall HR-QoL 1 to 4 months post-intervention	AQoL	1	120	−0.29 (−0.70 to 0.12)	–
	EQ-5D	6	614	−0.01 (−0.27 to 0.25)	52.7
	QLI-Sp	1	80	0.31 (−0.16 to 0.78)	–
	RAQoL	1	108	0.09 (−0.29 to 0.46)	–
	SF-36	2	103	0.06 (−0.97 to 1.09)	81.6
	WHOQOL-BREF	1	168	−0.03 (−0.43 to 0.37)	–
Overall HR-QoL 6 to 12 months post-intervention	AQoL	3	474	0.14 (−0.06 to 0.33)	2.3
	EQ-5D	3	465	−0.04 (−0.25 to 0.17)	0
	SF-36	2	357	0.31 (−0.29 to 0.91)	81.5
	RAQoL	1	108	−0.08 (−0.46 to 0.29)	–
Physical HR-QoL immediately post-intervention	SF-36	3	84	−0.63 (−2.52 to 1.26)	90.7
	SF-12	3	411	0.17 (−0.03 to 0.36)	0
Physical HR-QoL 1 to 3 months post-intervention	EQ-5D	1	53	−0.07 (−0.60 to 0.47)	–
	SF-36	2	52	1.09 (−0.73 to 2.91)	88.6
	SF-12	4	352	0.17 (−0.04 to 0.38)	0
Physical HR-QoL 6 to 12 months post-intervention	SF-12	2	365	−0.02 (−0.23 to 0.19)	0
Mental HR-QoL immediately post-intervention	EQ-5D	1	38	0.60 (−0.05 to 1.25)	–
	SF-36	2	38	−0.04 (−0.75 to 0.67)	0
	SF-12	3	411	0.11 (−0.08 to 0.30)	0
Mental HR-QoL 1 to 3 months post-intervention	EQ-5D	2	82	**−0.64 (−1.08 to −0.19)**	0
	SF-12	4	352	−0.01 (−0.26 to 0.23)	23.9
Mental HR-QoL 6 to 12 months post-intervention	SF-12	2	365	0.13 (−0.08 to 0.34)	0

SMPs = self-management programs; HR-QoL = health-related quality of life; AQoL = assessment of quality of life scale; EQ-5D = Euro quality of life 5 dimensions scale; FIQR = revised fibromyalgia impact questionnaire; KOOS-QoL = Knee injury and osteoarthritis outcome score for quality of life; QLI-Sp = Spanish version of quality of life index scale; RAQoL = rheumatoid arthritis quality of life scale; SF-6D = Short-Form Health Survey 6 Scale; SF-12 = Short-Form Health Survey 12 Scale; SF-36 = Short-Form Health Survey 36 Scale; WHOQOL-BREF = World Health Organization quality of life.

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