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What are the functional and clinical characteristics shared by fibromyalgia and low back pain? A scoping review

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Abstract

Background Fibromyalgia and chronic primary low back pain are two chronic pain conditions with a significant biopsychosocial burden. Recently, the International Association for the Study of Pain has grouped them under the term chronic primary pain. To further explore similarities and differences between these two conditions, the objective of this scoping review is to explore the pain-related, physiological and psychological outcomes in individuals with fibromyalgia and low back pain.

Methods The following databases were used to find relevant studies, using the PRISMA guidelines: Medline, Psycinfo, and CINAHL. Studies were included if they encompassed both participants with fibromyalgia or low back pain, with the objective to compare pain-related, physiological and/or psychological outcomes.

Results Nineteen studies were selected for extraction. Among the 2801 participants, 968 had fibromyalgia (mean age 48.56 ± 7.97 years, with 94% being female) and 896 had low back pain (mean age 47.48 ± 8.15 years, with 80% being female). Pain sensitivity, physical dysfunction, illness perception, psychological distress, alexithymia, depression, and anxiety were generally more severe in participants with fibromyalgia. Most studies found similar levels of pain intensity, kinesiophobia, quality of pain, quality of life, impact of pain, suicidal risk, anger, and social support comparing individuals with fibromyalgia and individuals with low back pain.

Discussion This scoping review highlights that although both conditions show similar pain intensity and impact on quality of life, fibromyalgia is associated with greater overall severity than low back pain, especially in sensitivity to pain and depression/anxiety.

Keywords Fibromyalgia, Low back pain, Physiological outcomes, Psychological outcomes

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Introduction

Chronic pain can be present in several conditions such as fibromyalgia (FM) and low back pain (LBP) and is a critical issue in public health, carrying substantial personal, societal, and economical challenges [1, 2]. FM is considered a chronic pain condition that encompasses a range of symptoms characterized by an amplification of pain by the central nervous system, accompanied by fatigue, concurrent issues with memory, sleep, and mood disorders [3]. Chronic primary LBP, another form of chronic pain, is defined as pain lasting for more than 12 weeks, located between the posterior rib edge and the gluteal fold [4]. FM and LBP represent a significant economic burden, with annual direct costs of $2853 USD [5] and $7211 USD per patient [6], respectively. FM primarily affects female in their fifties, and mostly those with a lower level of education and economical status [7]. The prevalence of LBP occurs between the ages of 45 and 54, especially among individuals with lower socioeconomic status. However, no significant differences in prevalence are observed between male and female with LBP [8, 9]. Depending on the country and diagnostic criteria used, FM is estimated to affect between 0.4% and 9.3% (lifetime prevalence of 2.7% on average) of the population [3, 10]. Based on a recent systematic analysis conducted in 204 countries, the point prevalence of chronic primary LBP is 7.5% [8, 9] and the median one year prevalence for adults is 37.4% [11].

The International Association for the Study of Pain (IASP) has recently proposed a new classification for chronic primary pain syndrome sharing similar characteristics [2]. The underlying pain mechanisms of these two conditions are not yet fully understood, which is why the IASP suggests grouping widespread chronic pain (FM) and primary musculoskeletal chronic pain (including chronic LBP) under the term "chronic primary pain". This new denomination is defined as "pain in one or more anatomical regions that persists or recurs for longer than 3 months, associated with significant emotional distress (e.g. anxiety, anger, frustration, or depressed mood) and/or significant functional disability (interference in activities of daily life and participation in social roles). In addition, the symptoms should not be better explained by another diagnosis." [2].

Whether chronic localized pain (such as LBP) and chronic widespread pain conditions (like FM) involve distinct pathophysiological mechanisms or if an overlap exists between their causes and sustaining factors have received limited attention [12]. It is suggested that regional pain syndromes precede the development of widespread pain in most patients with FM [13]. FM could then be considered an advanced clinical stage of the musculoskeletal pain continuum, with a subgroup of patients experiencing widespread pain preceded by long-standing localized or regional musculoskeletal pain [14, 15]. FM and chronic LBP are two conditions associated with central sensitization despite having different pain distributions, and they exhibit signs of central hyperexcitability as well as abnormal pain modulation [14, 16, 17]. Giesecke et al. [18] showed that patients with chronic LBP experience a reduced pain threshold (hyperalgesia) in areas beyond the back, suggesting an abnormal central sensitization [16, 19], as observed in FM [3]. Individuals with FM and those with LBP show similar activation patterns in pain-associated cortical regions during functional magnetic resonance imaging (fMRI), distinguishing them from healthy controls [20].

Psychological factors, such as somatic symptoms and affective distress, are commonly associated with individuals with LBP and FM [21]. In localized or widespread pain syndrome, the chronicity of pain can be triggered by specific stressors such as catastrophic events (e.g., post-traumatic stress) [22–24], even though the literature lacks consistency [21]. Moreover, research indicates that individuals suffering from depression and anxiety have an increased risk of developing LBP or FM [24–26]. The presence of comorbid mood disorders and an individual's cognitive appraisal of their pain could impact pain processing in FM [24]. For instance, Gracely et al. [19] found significant positive correlations between pain catastrophizing scores and increased fMRI signal in multiple brain regions related to pain among participants with FM. Catastrophizing is also associated with both experimental pain sensitivity and clinical pain among patients with chronic LBP [27].

The IASP has recently encouraged the identification of psychological and physiological characteristics contributing to the development of primary chronic pains, including LBP and FM, given its complexity [2]. Therefore, the aim of this scoping review is to explore and compare the pain-related, physiological and psychological characteristics of participants with FM and LBP. Through the identification of similarities and differences, we seek to enhance our overall understanding of these two chronic pain conditions. By summarizing the available evidence, we hope to provide a comprehensive overview of similarities and areas of convergence between FM and LBP, while also identifying gaps and future research directions.

Materials and methods

Study design

The objective of scoping reviews is to summarize and share research findings, identify research gaps on widely studied topics, and provide recommendations for future research [28]. Our work was conducted according to the framework developed by Peters et al. [28] and Pham et al. [29].

Descriptive synthesis

The search strategy yielded a total of 896 articles. After duplicate processing, 368 articles were screened for title and abstract. This analysis phase led to a total of 46 articles eligible for full-text reading. Finally, 19 articles were selected for inclusion in our article. The PRISMA flow diagram summarizing the entire strategy for each stage is presented in Fig. 1.

Search strategy

The search strategy was developed by one of the authors (B.C.) with the assistance of a university librarian. The following databases were explored to find relevant studies for the scoping review: Medline, Psycinfo, and CINAHL. The search was organized around four key concepts: "fibromyalgia", "low back pain", "physiological factors", and "psychological factors". The adopted strategy involved combining text words and MeSH terms to encompass the most appropriate keywords surrounding the key concepts. The reference lists of the studies were also examined to identify potential additional sources. The search strategy was last conducted in October 2023 with no restrictions on publication date. EndNote 20.6 was used for reference deduplication across all databases, keeping track of the number of duplicate entries found, and managing the search.

Selection criteria

To be included for extraction, full-text versions of relevant papers had to be published in French or in English. The studies had to involve at least two groups of participants with diagnosed FM and chronic non-specific LBP. The data measured had to be related to psychological, physiological, or both characteristics for both participants with LBP and FM. Only studies with the primary objective of comparing physiological or psychological variables were eligible for inclusion. Experimental studies (including RCTs), observational studies (including cohorts and case-control studies), longitudinal studies and validation studies of measurement instruments were also eligible for inclusion.

Research involving acute pain, laboratory-induced pain, and cancer-related pain were excluded. Also, studies focusing solely on FM, solely on LBP, or not

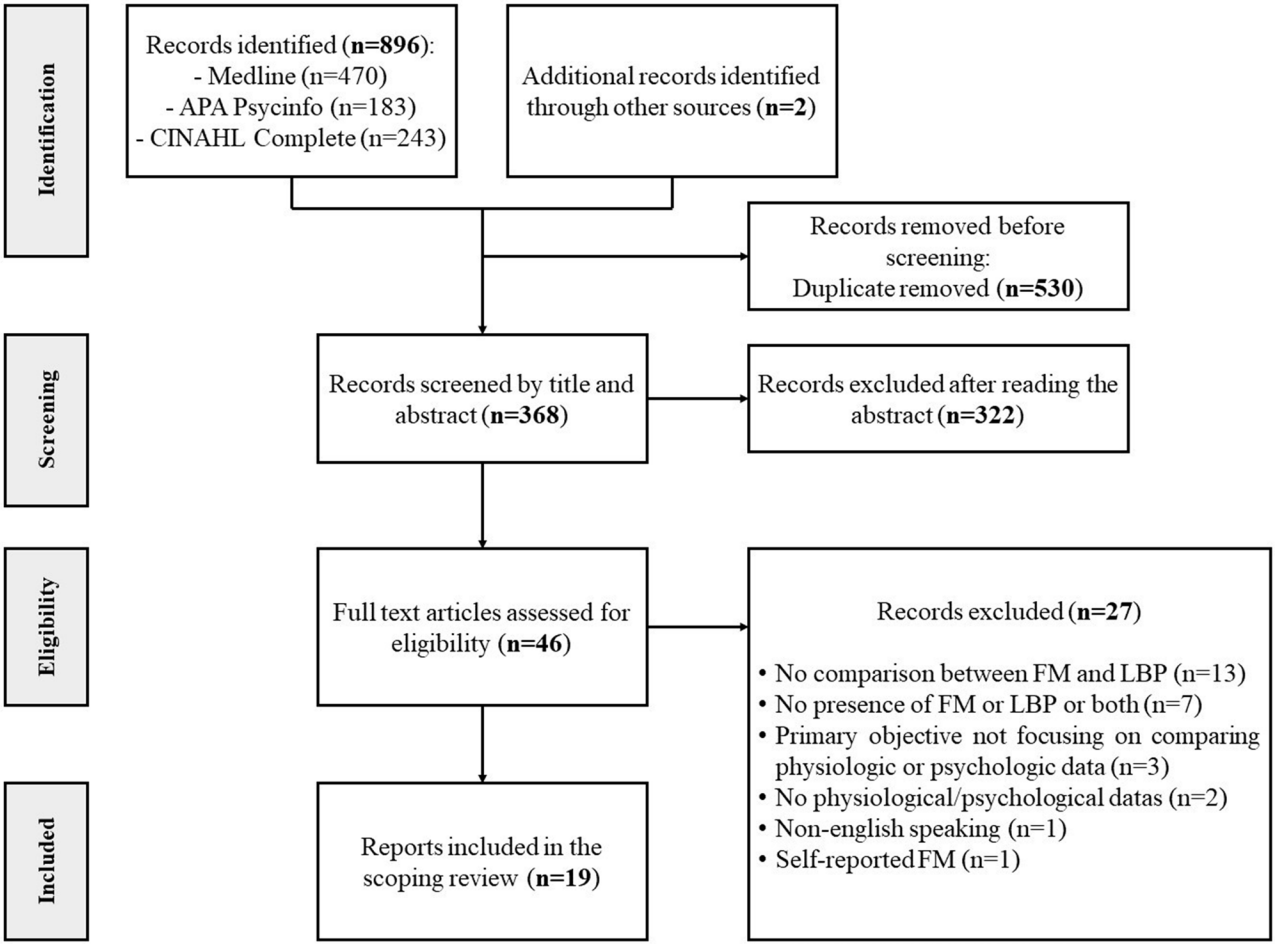

Fig. 1 Flowchart diagram

comparing the two were not considered. Reviews and studies that presented findings derived from secondary analyses of data published in other articles, case reports and case series were excluded. Literature reviews were not included in the data extraction but were kept for analysis and discussion purposes.

Screening and inclusion

B.C. and M.T. independently screened articles for potential inclusion in the scoping review separated in two phases. The first phase consisted of independently categorizing potentially relevant studies by reading the title and abstract. In the second phase, the authors made their final decision regarding the inclusion of potentially relevant articles by reading the entire articles. The authors met at the end of phases 1 and 2 to discuss and document the eligibility or reasons for article exclusions. Any differences in opinions were resolved through discussion and achieving an agreement. An additional reviewer (M.D.) was involved if consensus could not be reached.

Data extraction

Data extraction included the following parameters: first author's name, country, publication year, study objective(s) and design, participants' characteristics (sample size, age, and gender), the criteria or definition for participants with FM and those with LBP, pain-related, physiological, and psychological outcome measures.

Data synthesis

A synthesis of included studies was conducted to compile details on first author's name, country, and year of publication, aim and study design, sample characteristics (size, age and gender), diagnostic criteria, pain-related, physiological and psychological outcomes measures and additional comments made by the authors (limitations). Pain related and physiological outcomes were classified in six sets of outcomes: those related to pain intensity, pain quality, perceived disability, localization of pain, sensitivity to pain, physical function (e.g., balance, endurance, strength). Psychological outcomes were classified in six sets of outcomes; those related to depression and anxiety, to quality of life, catastrophizing and kinesiophobia, and other mental health factors (e.g., psychological distress, anger, suicide risk). The type of assessment method used to evaluate each outcome was reported, along with the frequency of their use in studies. Table 1 presents the summary table comparing physiological and psychological data between individuals with FM and individuals with LBP.

Results

Characteristics of included studies

Table 1 summarizes the characteristics of the studies included in our analysis. Fourteen of them were cross-sectional studies (74%) [30–43], two were exploratory and descriptive studies (11%) [44, 45], two were case-control studies (11%) [46, 47] and one was a prospective cohort study (4%) [48]. Across all studies and out of a total of 2719 participants, there were 968 participants with FM (94% of whom were female) and 896 participants with LBP (80% of whom were female). Not all studies matched the number of participants with FM to the number of participants with LBP, which explains the difference between the two numbers. The weighted mean age of participants with FM was 48.56±7.97 years, and 47.48±8.15 years for participants with LBP. The 855 other participants are composed of 605 healthy controls, 76 individuals with shoulder/neck pain, 71 individuals with rheumatoid arthritis, 51 individuals with osteoarthritis, 30 individuals with a somatoform pain disorder, and 22 individuals with a complex regional pain syndrome.

In 14 studies (74%), the 1990 American College of Rheumatology (ACR) criteria were used to diagnose participants with FM [30–32, 34, 36–39, 41, 43–47] whereas the 2010 ACR criteria were used in three studies (16%) [33, 35, 40] and the 2016 ACR criteria in one study (5%) [48]. In one study (5%) the criteria were not specified [42]. The 1990 ACR criteria were the most frequently used criteria for diagnosing FM across all studies. However, of the 14 studies that used the 1990 ACR criteria, six [34, 37, 44–47] used them despite the ACR criteria of 2010 [49] or 2016 [50] being validated and recommended by the ACR for diagnosing FM.

Figure 2 illustrates the proportion of studies using the latest diagnostic criteria for participants with FM.

Regarding LBP, seven studies (37%) did not specify how the diagnosis of the condition was made [30, 33, 38, 39, 42, 43, 47]. The remaining 12 studies (63%) correctly specified the criteria used to recruit participants with LBP [31, 32, 34, 36, 37, 40, 41, 44–46, 48, 51]. Ten studies (53%) described LBP under the term chronic LBP [33, 35, 36, 38–42, 46, 47], four (21%) used the term LBP [30, 32, 37, 48], three (16%) included back pain solely [31, 43, 51], two (11%) used the term chronic local and widespread back pain [43–45], one (5%) included chronic non-specific LBP [34] and one (5%) used the term recurrent LBP [35].

Figure 2 illustrates the proportion of valid back pain criteria for back pain participants.

Pain related and physiological outcomes

Pain related outcomes

Figure 3 show the proportion of studies assessing physiological outcomes and the comparison between FM

Table 1 Summary table comparing pain related, physiological and psychological data between FM and LBP

Author(s), country, year	Aim(s)	Study design	Sample (*n* ; Mean age ± SD ; sex)	Diagnostic criteria	Psychological outcome measures	Pain related and physiological outcome measures	Results	Additional comments
Amir et al., Israel, 2000 [30]	To examine if participants with FM differ from similar chronic pain patient groups in terms of psychological variables.	Cross-sectional	*n* = 202 FM (51; 48.96 ± 8.41; 51 F / 0 M) LBP (50; 47.12 ± 11.61; 50 F / 0 M) Rheumatoid arthritis (51; 46.25 ± 13.61; 51 F / 0 M) Healthy control (50; 45.66 ± 13.11; 50 F / 0 M)	FM: 1990 ACR criteria. LBP: not specified.	Anger (STAEI), social support (SSS). suicide risk (SRS).	None.	*Significant differences*: None. *No significant differences*: anger, social support, suicide risk.	The significant differences are small, the implication of the findings should be viewed with caution. Results of the study can only be extrapolated to female with FM and/or CLBP as no men were included in the study.
Angst et al., Switzerland, 2022 [48]	To measure the magnitude and predictive significance of the connections between catastrophizing and pain and physical function in patients with FM and LBP.	Prospective cohort	*n* = 142 FM (71; 48.9 ± 9.4; 63 F / 8 M) LBP (71; 49.3 ± 10.2; 63 F / 8 M)	FM: ACR 2016 criteria for at least 3 months. LBP: history of chronic solely lumbar back pain with or without radiculopathy for at least 3 months.	Coping skills and pain catastrophizing (CSQ).	Perceived disability (MPI and physical functioning scale of the SF-36), walking endurance (6MWD).	*Significant differences*: pain catastrophizing (FM < LBP). *No significant differences*: perceived disability, walking endurance.	The construct, content and criterion of catastrophizing are not universally defined and exhibit several weaknesses.
Arnold et al., Germany, 2008 [31]	To examine the specificity of affective pain modulation in FM participants by comparing it with somatoform pain disorder, BP participants, and healthy controls.	Cross-sectional within-subject	*n* = 120 FM (30; 50.50 ± 8.53; 25 F / 5 M) BP (30; 50.43 ± 10.04; 25 F / 5 M) Somatoform pain disorder (30; 48.23 ± 7.48; 25 F / 5 M) Healthy controls (30; 48.40 ± 8.31; 25 F / 5 M)	FM: 1990 ACR criteria BP: disorders of the spine and back (ICD 10, M40-M54).	None.	Pain intensity (NRS).	*Significant differences*: None. *No significant differences*: pain intensity	Pain medication was not controlled.

Table 1 (continued)

Author(s), country, year	Aim(s)	Study design	Sample (*n* ; Mean age ± SD ; sex)	Diagnostic criteria	Psychological outcome measures	Pain related and physiological outcome measures	Results	Additional comments
Blumenstiel et al., Germany, 2011 [32]	To disclose commonalities and differences in the pathophysiology of FM and CBP.	Cross-sectional observational	*n* = 64 FM (21 ; 50.6 ± 9.5 ; 21 F / 0 M) CBP (23 ; 43.4 ± 8.6 ; 23 F / 0 M) Healthy controls (20 ; 38.3 ± 7.6 ; 20 F / 0 M)	FM: 1990 ACR criteria CBP: Presence of back pain for at least 45 days within the last 3 months	None.	Pain intensity (NRS), pain sensitivity (QST protocol), perceived disability (FFbHR).	*Significant differences*: cold and hot pain threshold, mechanical pain sensitivity, mechanical pain threshold, pain intensity, perceived disability, PPT. (FM < CBP) *No significant differences*: cold and warmth detection threshold, mechanical detection threshold, vibration detection threshold, wind-up ratio.	The sample size of each group is small. FM were significantly older than the other groups. Results of the study can only be extrapolated to female with FM and/or CLBP as no men were included in the study.
Capraro et al., Italy, 2012 [33]	To analyze the perception of illness in individuals with FM with the aim of highlighting a potential relationship between these conditions and the affective-emotional state and quality of life of patients, comparing with other chronic pain conditions.	Cross-sectional observational	*n* = 74 FM (34; 47.35 ± 8.33; 34 F / 0 M) CLBP (20; 51.3 ± 7.8; 20 F / 0 M) Rheumatoid arthritis (20; 53 ± 12.76; 20 F / 0 M)	FM: 2010 ACR criteria. CLBP: not specified.	Anxiety (STAI-Y), depression (BDI-II), illness perception (IPQ-R), positive and negative affects (PANAS), quality of life (NPH).	Pain intensity (VAS), perceived disability (MPI), quality of pain (MPQ).	*Significant differences*: anxiety and depression (FM < LBP). *No significant differences*: illness perception, pain intensity, perceived disability, positive and negative affects, quality of life.	Results of the study can only be extrapolated to female with FM and/or CLBP as no men were included in the study. Sample sizes were small and differed between the three groups.
de Olivieira et al., Brazil, 2019 [34]	To compare pain and quality of life of participants with knee OA, LBP, and FM.	Cross-sectional (qualitative)	*n* = 87 (85,1% female) FM (29; 57.8 ± 11.2) CNLBP (29; 48.4 ± 11.8) OA (29; 62.6 ± 8.7)	FM: 1990 ACR criteria. CNLBP: presence of pain of unknown origin, localized below the costal margin and above the inferior gluteal folds, with or without leg pain, for more than 3 months.	Quality of life (SF-36).	Localization of pain (pain map), pain intensity (NPRS), quality of pain (MPQ).	*Significant differences*: localization of pain, miscellaneous quality of pain (FM < LBP). *No significant differences*: pain intensity, sensory, affective, evaluative aspect of pain, quality of life.	The authors did not provide the proportion of female in each group.

Table 1 (continued)

Author(s), country, year	Aim(s)	Study design	Sample (*n* ; Mean age ± SD ; sex)	Diagnostic criteria	Psychological outcome measures	Pain related and physiological outcome measures	Results	Additional comments
Gerhardt et al., Germany, 2016 [44]	To compare QST of chronic localized pain and chronic generalized pain in patients with LBP (chronic local and widespread back pain) with FM and control patients without pain.	Explorative and descriptive	*n* = 207 FM (90; 55.1 ± 9.3; 80 F / 10 M) BP-CWP (29; 55.2 ± 8.3; 17 F / 12 M) BP-CLP (48; 59.7 ± 11.8; 24 F / 6 M) Healthy controls (40; 61.6 ± 12.0; 17 F / 23 M)	FM: 1990 ACR criteria. BP-CWP: chronic back pain plus contra lateral limb pain (upper + lower and left + right side of the body). BP-CLP: CWP criteria not fulfilled.	Anxiety and depression (HAD).	Localization of pain, pain intensity (VAS), perceived disability (FFbHR), pain sensitivity (QST protocol).	*Significant differences*: anxiety and depression scores, mean pain intensity, perceived disability, pressure pain and thermal sensitivity, spatial extent of pain, wind-up effect on the back and hand (FM < BP). *No significant differences*: None.	Significant differences for age and sex between groups.
Gerhardt et al., Germany, 2017 [45]	To compare the conditioned pain modulation in patients with LBP across different pain levels, such as CLP, CWP, and FM.	Explorative and descriptive	*n* = 177 FM (92; 55.6 ± 9.8; 82 F / 10 M) LBP-CWP (32; 55.5 ± 8.1; 20 F / 12 M) LBP-CLP (53; 59.7 ± 11.4; 27 F / 26 M)	FM: 1990 ACR criteria + back pain + contralateral limb pain + at least 11 to 18 tender points. BP-CWP: back pain + pain in the upper, lower, left, and right side of the body + fewer than 11 tender points. BP-CLP: CWP criteria not fulfilled.	Anxiety and depression (HAD).	Conditioned pain modulation (PPT and tonic heat pain), number of painful areas, pain intensity (VAS).	*Significant differences*: anxiety and depression, condition pain modulation, mean pain intensity, number of pain areas (FM < LBP-CLP). *No significant differences*: None.	Results can only be extrapolated to similar stimuli (mechanical and temperature sensitivity).
Goubert et al., Belgium, 2017 [35]	To compare quantitative sensory assessment in different groups of LBP patients with FM patients and healthy controls.	Cross-sectional	*n* = 101 FM (26; 45 ± 9; 19 F / 7 M) RLBP (23; 31 ± 10; 14 F / 9 M) Mild LBP (15; 46 ± 14; 8 F / 7 M) Severe LBP (16; 46 ± 14; 8 F / 8 M)	FM: 2010 ACR criteria. RLBP: pain in the back ≥ 6 months with a frequency of ≥ 2 episodes in the past year. Mild LBP: non-specific CLBP ≥ 3 months, 3 to 4 pain days a week. Severe LBP: non-specific CLBP ≥ 3 months, 7 pain days a week.	None.	Cuff pressure algometry (pressure pain detection threshold and pressure pain tolerance threshold, spatial summation, conditioned pain modulation), manual pressure algometry (PPT, temporal summation), perceived disability (RMDQ).	*Significant differences*: perceived disability (FM < RLBP), PPT of quadriceps, lower back, trapezius (FM < RLBP, severe LBP), pressure pain tolerance threshold (FM < RLBP), temporal summation of quadriceps, trapezius, lower back, and hand (FM < RLBP). *No significant differences*: pressure pain detection threshold.	Difficult to extrapolate the results as no psychosocial issues were considered.

Table 1 (continued)

Author(s), country, year	Aim(s)	Study design	Sample (*n* ; Mean age ± SD ; sex)	Diagnostic criteria	Psychological outcome measures	Pain related and physiological outcome measures	Results	Additional comments
Hägg et al., Sweden, 2010 [36]	To examine the quality of life of LBP patients who were eligible for surgery and compare it to that of FMS patients and the general population.	Cross-sectional	*n* = 477 FM (99; 46.3 ± 9.1; 99 F / 0 M) CLBP (100; 43.4 ± 8.5; 49 F / 51 M) Healthy controls (278; 44.5 ± 9.2; 150 F / 128 M)	FM: 1990 ACR criteria. CLBP: local pain at one or both two lower lumbar segments for at least two years. Degenerative changes on plain X-ray or magnetic resonance images at the segment.	Depression (ZDS and BDI), quality of life (QOLS-S).	None.	*Significant differences*: correlation between quality of life and depression (FM < LBP) *No significant differences*: depression, quality of life.	Participants with CLBP in this study were surgical candidates who may report higher depression and physical dysfunction scores than non-surgical patients with CLBP.
Jimenez-Rodríguez et al., Spain, 2014 [37]	To evaluate suicidal ideation in individuals with FM by comparing them to the overall population and patients suffering from LBP.	Cross-sectional observational	*n* = 126 FM (44; 54.5 ± 12.7; 41 F / 3 M) LBP (32; 50.1 ± 8.2; 18 F / 14 M) Healthy controls (50; 50.5 ± 7.5; 36 F / 14 M)	FM: 1990 ACR criteria. LBP: constant or intermittent nonspecific low-back pain for at least 3 months.	Depression (BDI), quality of life (SF-12), risk of suicide (Plutchik Suicide Risk Scale).	Pain intensity (VAS on the BPI), perceived disability (BPI).	*Significant differences*: depression, perceived disability, mental component of quality of life, risk of suicide (FM < LBP). *No significant differences*: pain intensity, physical component of quality of life.	Authors did not evaluate family history of suicide or the existence of previous suicide attempts, two factors well known to predict the risk of suicide.
Lai et al., Italy, 2021 [46]	To explore electrophysiological responses to visual stimuli related to pain in participants with FM and to assess the psychopathological characteristics of this syndrome, in comparison with participants with LBP pain and healthy individuals.	Pilot case-control	*n* = 23 FM (12; 55.33 ± 4.92; 12 F / 0 M) CLBP (6; 59.5 ± 4.64; 6 F / 0 M) Healthy controls (5; 57.8 ± 7.01; 5 F / 0 M)	FM: 1990 ACR criteria CLBP: 1990 ACR criteria	Psychological distress (SCL-90-R).	Pain intensity (VAS), perceived disability (ODI and HAQ-D), quality of pain (MPQ).	*Significant differences*: None. *No significant differences*: pain intensity, perceived disability, psychological symptoms, quality of pain.	Small sample size for each group. Results of the study can only be extrapolated to female with FM and/or CLBP as no men were included in the study.
Lambin et al., Canada, 2011 [38]	To compare individuals with FM and individuals with chronic LBP on an index of repetition-induced summation of activity-related pain.	Cross-sectional	*n* = 100 FM (50; 44.6 ± 8.3; 50 F / 0 M) CLBP (50; 43.3 ± 8.1; 50 F / 0 M)	FM: 1990 ACR criteria CLBP: criteria not fulfilled	Depression (BDI-II), fear of movement (TSK), pain catastrophizing (PCS).	Pain intensity (NRS), perceived disability (PDI).	*Significant differences*: perceived disability (FM < CLBP). *No significant differences*: pain intensity, fear of movement, catastrophizing, depression.	Results of the study can only be extrapolated to female with FM and/or CLBP as no men were included in the study.

Table 1 (continued)

Author(s), country, year	Aim(s)	Study design	Sample (*n* ; Mean age ± SD ; sex)	Diagnostic criteria	Psychological outcome measures	Pain related and physiological outcome measures	Results	Additional comments
Marques et al., Brazil, 2001 [39]	To evaluate and compare pain as reported by outpatients with FM, LBP, and OA.	Cross-sectional	*n* = 64 FM (24; 45; 22 F / 2 M) CLBP (18; 51; 15 F / 3 M) OA (22; 64; 21 F / 1 M)	FM: 1990 ACR criteria CLBP: criteria not fulfilled	None.	Pain intensity (VAS pain-rating index for sensory and affective pain)	*Significant differences*: affective pain intensity (FM < CLBP). *No significant differences*: sensory pain intensity.	Small sample size for each group.
Mellegård, Grossi and Soares, Sweden, 2001 [43]	To study differences of pain and pain coping strategies among individuals with FM, LBP and cervicalgia.	Cross-sectional	*n* = 288 FM (81; 47.2 ± 9.1; 81 F / 0 M) BP (131; 44.8 ± 11.6; 131 F / 0 M) Neck / shoulder pain (76; 45.4 ± 10.9; 76 F / 0 M)	FM: 1990 ACR criteria. BP: criteria not fulfilled.	None.	Pain intensity, duration, frequency, and complexity (Pain Questionnaire).	*Significant differences*: pain intensity, duration and complexity, perceived disability (FM < BP). *No significant differences*: None.	Results of the study can only be extrapolated to female with FM and/or CLBP as no men were included in the study.
Mingorance et al., Spain, 2021 [40]	To compare patients with FM and LBP on clinical symptoms as well as other pain-related parameters, sensitivity to vibration, and balance.	Cross-sectional	*n* = 180 FM (60; 52.57 ± 1.08; 54 F / 6 M) CLBP (60; 52.5 ± 1.42; 45 F / 15 M) Healthy controls (60; 49.87 ± 1.25; 45 F / 15 M)	FM: 2010 ACR criteria CLBP: participants presenting axial back pain as the predominant complaint.	None.	Back muscle strength (dynamometer), balance (Berg scale, timed up and go test), quality of pain (SF-MPQ), sensitivity to pain (PPT), vibration thresholds, walking endurance (6MWD, Borg scale).	*Significant differences*: back muscle strength, PPT on epicondyle and greater trochanters, quality of pain, static and dynamic balance, walking endurance (FM < CLBP). *No significant differences*: PPT on index.	Medication was not supressed and could have influence the results as medication demonstrate side effects on postural stability.
Sullivan, Adams and Ellis, Canada, 2012 [47]	To establish the feasibility of using the Progressive Goal Attainment Program (PGAP) to facilitate the return to work for individuals with fibromyalgia, in comparison with individuals with LBP.	Case-control	*n* = 60 FM (30; 36.9 ± 9.8; 30 F / 0 M) LBP (30; 36.1 ± 10.9; 30 F / 0 M)	FM: 1990 ACR criteria. LBP: criteria not fulfilled.	Depression (BDI), kinesiophobia (TSK), pain catastrophizing (PCS).	Pain intensity (NRS), perceived disability (PDI).	*Significant differences*: depression and pain catastrophizing (FM < CLBP). *No significant differences*: kinesiophobia, pain intensity, perceived disability.	Only individuals with high scores on psychosocial risk measures were included, which limit the extrapolation of the results.

Table 1 (continued)

Author(s), country, year	Aim(s)	Study design	Sample (*n*; Mean age ± SD; sex)	Diagnostic criteria	Psychological outcome measures	Pain related and physiological outcome measures	Results	Additional comments
Tuzer et al., Turkey, 2011 [41]	To assess the psychological symptoms of alexithymia and the types of causal attributions related to symptoms in female FM and LBP	Cross-sectional	*n* = 198 FM (70; 38.97 ± 7.89; 70 F / 0 M) LBP (56; 44.23 ± 9.31; 56 F / 0 M) Healthy controls (72; 36.97 ± 10.43; 72)	FM: 1990 ACR criteria LBP: pain in the area below the sixth thoracic vertebra for at least 1 year, with no specific organic cause.	Alexithymia (TAS-20), symptoms inventory (BSI).	None.	*Significant differences*: alexithymia, anxiety, depression, hostility, and somatization (FM < LBP). *No significant differences*: None.	LBP participants were older and less educated than the two other groups. FM participants were patients seeking treatment. Results of the study can only be extrapolated to female with FM and/or LBP as no men were included in the study.
Verbunt, Pernot and Smeets, Netherlands, 2008 [42]	To study the factors contributing to disability in individuals with FM by examining psychological stress in comparison to individuals with LBP.	Cross-sectional	*n* = 111 FM (54; 40.0 (32–48); 47 F / 7 M) LBP (35; 44.0 (37–50); 15 F / 20 M). Complex regional pain syndrome (22; 45.5 (34–52); 17 F / 5 M).	FM: diagnosed by a rheumatologist, without consulting ACR criteria. LBP: criteria not fulfilled.	Kinesiophobia (TSK), psychological distress (SCL-90).	None.	*Significant differences*: psychological distress (FM < LBP). *No significant differences*: kinesiophobia	The sample size was unequal between the groups. Not all of the patients with FM were diagnosed by a rheumatologist (94.6%), according to their professional rheumatological guidelines.

Note. 6MWT = Six-minute walking test; BDI = Beck Depression Inventory; BP = Back Pain; BPI = Brief Pain Inventory; BSI = Brief Symptom Inventory; CBP = Chronic localized/widespread Back Pain; CLBP = Chronic Low Back Pain; CSQ = Coping Strategies Questionnaire; FFbHR = Functional Ability Questionnaire for the measurement of back pain-related disability; FM = fibromyalgia; FM < LBP = psychological data scores are more frequently significantly worst for FM participants; FM = LBP = psychological data scores are more frequently not significantly different between FM participants and LBP participants; HADS = Hospital Anxiety and Depression Scale; IPQ-R = Illness Perception Questionnaire-Revised; LBP = Low Back Pain; MPQ = McGill Pain Questionnaire; MPI = Multi-Dimension Pain Inventory; NHP = Nottingham Health Profile; NRS = Numeric Rating Scale; NsLBP = Non-specific Low Back Pain; OA = Osteoarthritis; PANAS = Positive and Negative Affect Schedule; PCS = Pain Catastrophizing Scale; PDI = Pain Disability Index; PPT = Pressure Point Threshold; QOLS = Quality-of-Life Scale; QST = Quantitative Sensory Testing; RLBP = Recurrent Low Back Pain; RMDQ = Roland Morris Disability Questionnaire; SCL–90 = Symptom checklist 90; SF-12/36 = Short-Form Health Survey; SF-36 = Short Form 36 (for physical functioning); SRS = Suicide Risk Scale; SSS = Social Support Scale; STAEI = State-Trait Anger Expression Inventory; STAI-Y = Trait Anxiety Inventory-State Y; TAS-20 = Toronto Alexithymia Scale; TSK = Tampa Scale for Kinesiophobia; VAS = Visual Analogic Scale; ZDS = Zung Depression Scale

and LBP results. Eight studies did not find differences between participants with FM and those with LBP regarding pain intensity [31, 33, 34, 37–39, 46, 47] while five studies found that pain scores were higher among participants with FM compared to participants with LBP [32, 39, 43–45] (Fig. 4). These studies used Visual Analogic Scale (VAS) [33, 37, 39, 44–46] and the Numeric Pain Rating Scale (NPRS) [31, 32, 34, 38, 43, 47] (Fig. 5).

Regarding the quality of pain, three studies did not find or report significant differences between individuals with FM and those with LBP [34, 39, 46] while two studies found that quality of pain scores were higher among participants with FM comparing to those with LBP [34, 40] (Fig. 4). These four studies used the McGill Pain Questionnaire (MPQ), but the authors did not analyze similarly the questionnaire (Fig. 5). Lai et al. [46] and

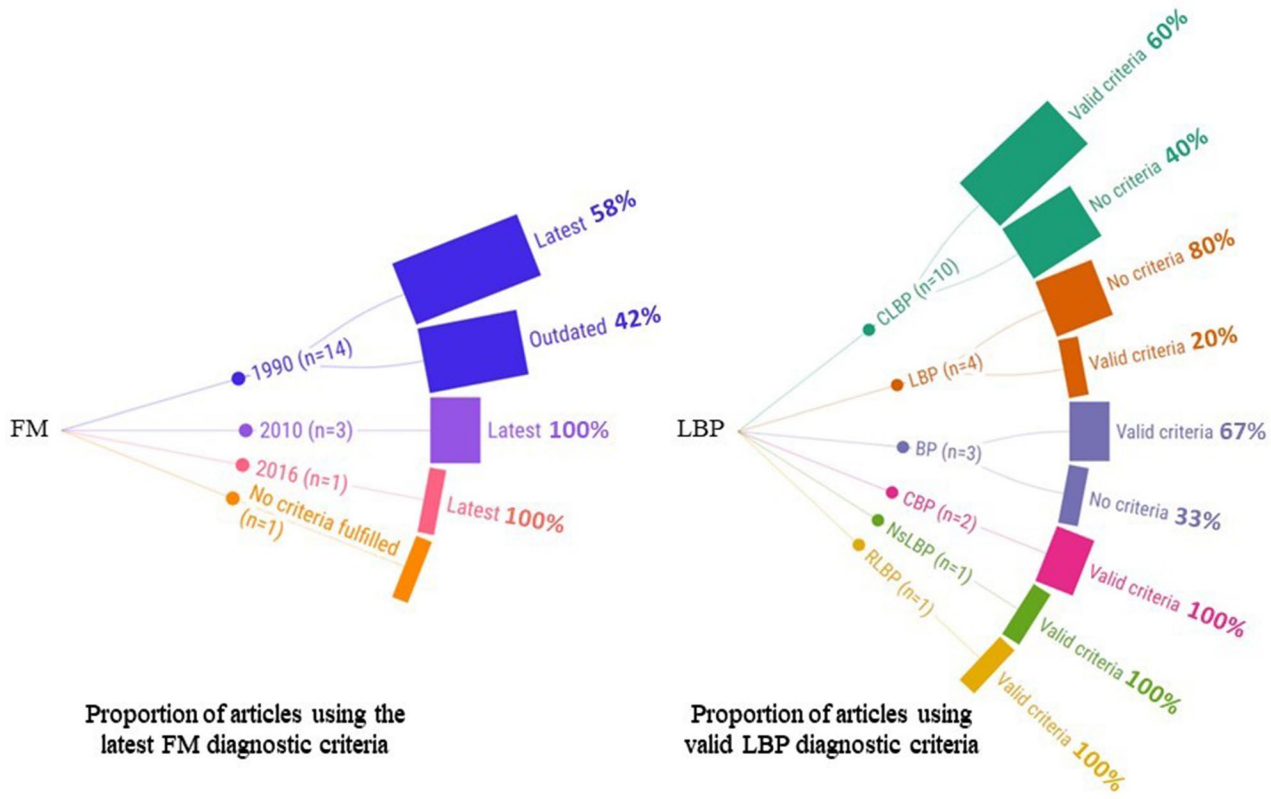

Fig. 2 Proportion of articles using the latest ACR diagnoses for fibromyalgia (left) and valid back pain criteria (right) at the time of publication. Note: 1990 = 1990 ACR criteria; 2010 = 2010 ACR criteria; 2016 = 2016 ACR criteria; CLBP = Chronic Low Back Pain; LBP = Low Back Pain; BP = Back Pain; CBP = Chronic localized/widespread Back Pain; NsLBP = Non-specific Low Back Pain; RLBP = Recurrent Low Back Pain

de Oliveira Paes Leme et al. [34] compared the score of the four dimensions of pain (sensory, affective, evaluative and miscellaneous), but only the miscellaneous dimension of pain was reported worst for participants with FM by de Oliveira Paes Leme et al. [34]. On the other hand, Marques et al. [39] and Mingorance et al. [40] used the subscale A (sensory and affective function), B (VAS), and C (verbal descriptor inventory) of the MPQ. Only Mingorance et al. [40] found significant worst pain quality score for the three subscales for participants with FM.

Three studies found that participants with FM had more pain areas than participants with LBP [34, 44, 45], with the pain map [34] and a body pain diagram [44, 45] (Fig. 4). Gerhardt et al. [44] and Gerhardt et al. [45] highlighted similarities in the localization of pain in participants with back widespread pain and participants with FM. However, the authors did not conduct any statistical analyses.

Considering all pain sensitivity measurement protocols used by the authors, two studies did not find any differences in pain sensitivity between individuals with FM and individuals with LBP [35, 40]. However, five studies found that pain sensitivity scores were lower for participants with FM compared to those with LBP [32, 35, 40, 44, 45] (Fig. 4). More precisely, results indicate a significantly lower sensitivity to heat pain [32, 44, 45] and pressure pain thresholds (PPT) [32, 35, 40, 44, 45] for participants with FM. Gerhardt et al. [44], Gerhardt et al. [45] and Blumenstiel et al. [32] used the Quantitative Sensory Testing (QST) protocol to compare pain and detection thresholds to external stimuli of participants with FM and those with LBP (thermal detection and thermal pain threshold, mechanical detection and pain threshold, mechanical pain sensitivity, wind-up ratio, PPT and vibration threshold). Goubert et al. [35] measured pain sensitivity with PPT, pressure pain tolerance threshold scores, and repetitive compressions with cuff pressure algometry. Mingorance et al. [40] used PPT and vibration threshold scores (Fig. 5).

Perceived disability

Regarding perceived disability, four studies reported no differences between individuals with FM and individuals with LBP [33, 46–48] and six studies found that perceived disability scores were higher among participants with FM comparing to participants with LBP [32, 35, 37, 38, 43, 44] (Fig. 4). These studies used the Multi-Dimension Pain Inventory (MPI) [33, 48], the Pain Disability Index (PDI)

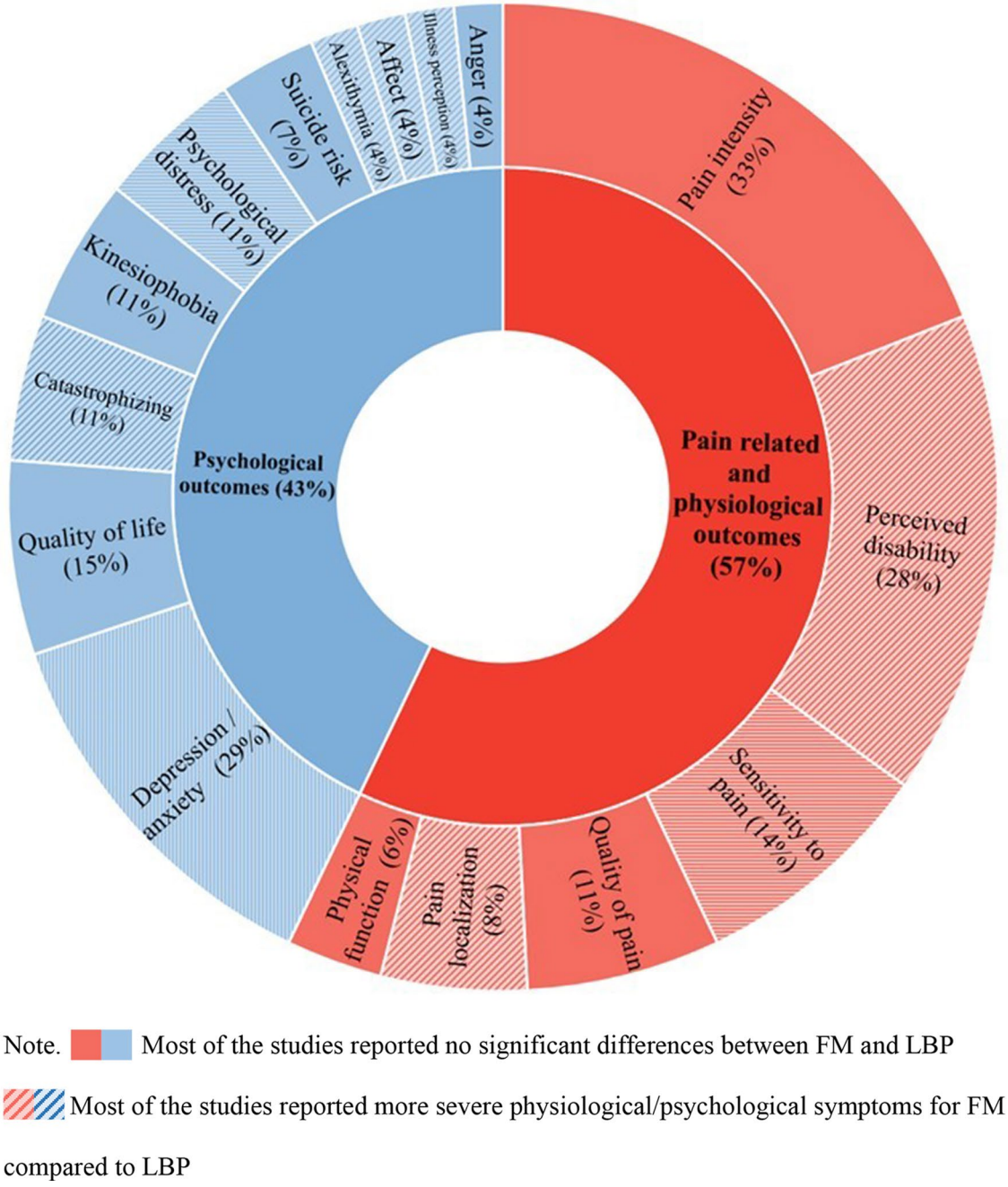

Fig. 3 Proportion of studies assessing pain related, physiological and psychological outcomes and comparison between fibromyalgia and low back pain results

[38, 47], the Hannover Functional Ability Questionnaire for the measurement of back pain-related disability (FFbHR) [32, 44], the Roland Morris Disability Questionnaire (RMDQ) [35], the Short Form 36 about physical activities [48], the Oswestry Disability Index (ODI) [46] and the interference of pain on the Brief Pain Inventory (BPI) [37] (Fig. 5). Capraro et al. [33] omitted to report MPI scores in their publication.

Physical function

For physical function, Mingorance et al. [40] reported worst back strength, walking endurance and overall balance for individuals with FM compared to individuals with LBP. Angst et al. [48] found no significant differences between the two conditions for walking endurance (Fig. 4). These studies used isometric back muscle test (dynamometer) [40] and functional tests : Berg scale,

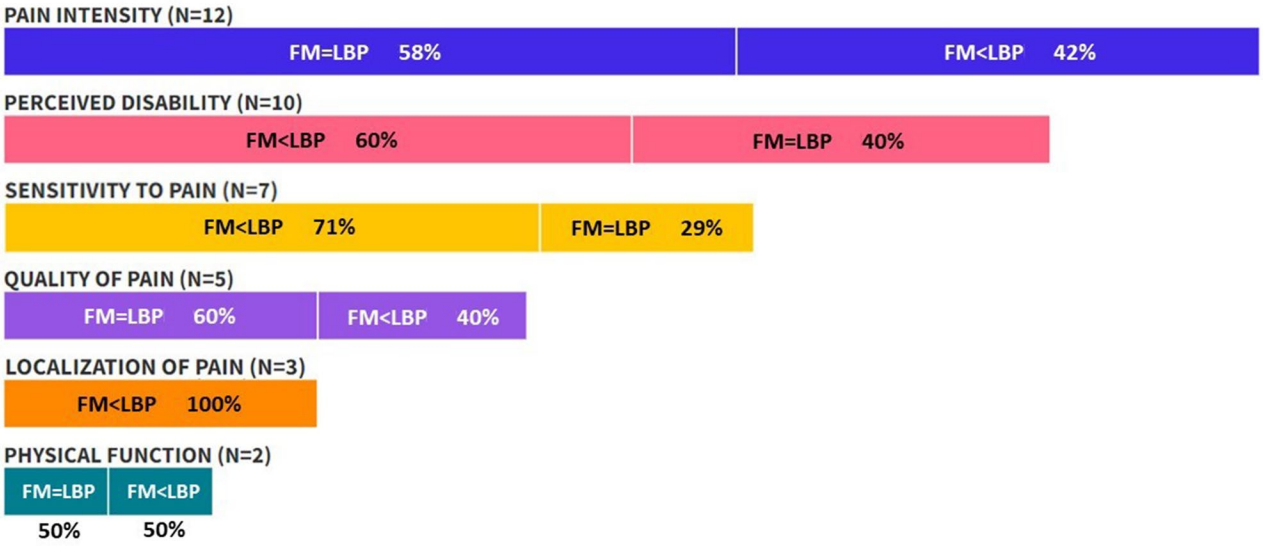

Fig. 4 Proportion of studies showing differences (and no differences) between fibromyalgia and low back pain participants for pain related and physiological data scores. Note: FM = fibromyalgia; LBP = low back pain; FM = LBP = physiological data scores are more frequently not significantly different between participants with FM and LBP; FM < LBP = physiological data scores are more frequently significantly worst for participants with FM

timed up and go test, static dynamic balance tests [40] and the six-minute walking test [40, 48] (Fig. 5).

Psychologic outcomes

Depression and anxiety

Figure 3 show the proportion of studies assessing psychological outcomes and the comparison between FM and LBP results. Two studies did not find significant differences between participants with FM and participants with LBP [36, 38] while six studies found significantly higher depression and anxiety scores for participants with FM [33, 37, 41, 44, 45, 47] (Fig. 6). The Beck Depression Inventory (BDI) [33, 37, 38, 47], Hospital Anxiety and Depression Scale (HADS) [44, 45], Zung Depression Scale (ZDS) [36], the Trait Anxiety Inventory-State Y (STAI-Y) [33] and the Brief Symptom Inventory (BSI) [41] were used in these studies (Fig. 7).

Quality of life

Four studies did not find significant differences between participants with FM and those with LBP [33, 34, 36, 37] while one study found significant lower quality of life scores for participants with FM [37] (Fig. 6). The Nottingham Health Profile (NHP) [33], The Short Form (SF) Health Survey 12 [37] and 36 [34] and the Quality-of-Life Scale (QOLS) [36] were used in these studies (Fig. 7).

Kinesiophobia and pain catastrophizing

Lambin et al. [38], Sullivan et al. [47] and Verbunt et al. [42] found no significant kinesiophobia score differences between participants with FM and participants with LBP, using the Tampa Scale for Kinesiophobia (TSK) (Fig. 6). For pain catastrophizing, Lambin et al. [38] found no significant differences between participants with FM and those with LBP with the Pain Catastrophizing Scale (PCS). Angst et al. [48] and Sullivan et al. [47] reported significantly worse pain catastrophizing scores for individuals with FM compared to individuals with LBP, using the Coping Strategies Questionnaire (CSQ about catastrophizing) and the PCS, respectively (Fig. 7).

Other mental health factors

Less frequently analyzed psychological outcomes from all studies have been compiled in this section. Regarding psychological distress, one study did not find significant differences between participants with FM and participants with LBP [46] while two studies found significantly higher distress scores for participants with FM [41, 42] (Fig. 6). These studies used the Symptom checklist 90 (SCL-90) [42, 46] and the Brief Symptom Inventory (BSI) [41] (Fig. 7).

One study found no difference in suicide risk between participants with FM and those with LBP [30] whereas one study reported a significant higher risk of suicide for individuals with FM [37] (Fig. 6). These studies used the Suicide Risk Scale (SRS) [37] and the Plutchik scale [30] (Fig. 7).

Amir et al. [30] also compared participants with FM and participants with LBP on anger and social support using respectively the State-Trait Anger Expression Inventory (STAEI) and the Social Support Scale (SSS) and found no significant differences between participants with FM and participants with LBP for these two outcomes (Fig. 7).

Capraro et al. [33] reported higher illness perception scores for participants with FM on the identity of illness

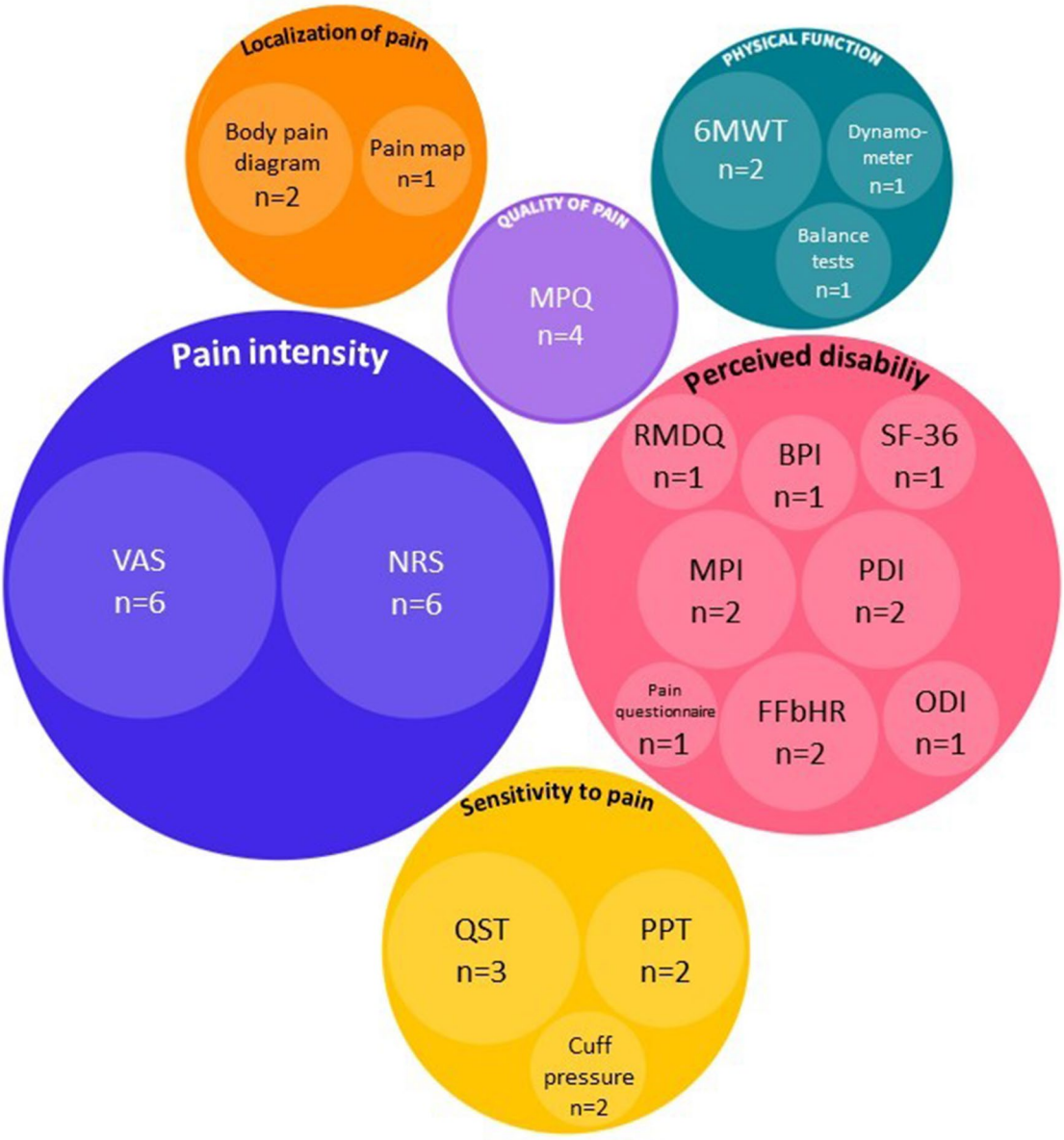

Fig. 5 Type and frequency (number of studies) of the different assessment methods used for every pain related and physiological outcome. Note. 6MWT = Six-minute walking test; BPI = Brief Pain Inventory ; CSQ = Coping Strategies Questionnaire ; FFbHR = Functional Ability Questionnaire for the measurement of back pain-related disability ; MPQ = McGill Pain Questionnaire ; MPI = Multi-Dimension Pain Inventory ; NRS = Numeric Rating Scale ; PCS = Pain Catastrophizing Scale ; PDI = Pain Disability Index ; PPT = Pressure Point Threshold ; QST = Quantitative Sensory Testing ; RMDQ = Roland Morris Disability Questionnaire ; SF-36 = Short Form 36 (for physical functioning) ; TSK = Tampa Scale for Kinesiophobia ; VAS = Visual Analogic Scale

scale but no significant differences for the opinions about illness and cause of the disease with the Illness Perception Questionnaire-Revised (IPQ-R). The same authors observed that participants with FM experienced significantly more frequent negative emotions than participants with LBP, using the Positive and Negative Affect Schedule (PANAS) (Figs. 6 and 7).

Furthermore, Tuzer et al. [41] reported higher alexithymia scores for participants with FM compared to participants with LBP, using the Toronto Alexithymia Scale (TAS-20) (Figs. 6 and 7).

Discussion

The objective of this scoping review was to explore and compare pain-related, physiological and psychological characteristics of participants with FM and those with LBP. Despite the heterogeneous results retrieved from the available literature comparing FM and LBP, it appears that alexithymia, anxiety, catastrophizing, depression, illness perception, pain sensitivity, perceived disability, and psychological distress are generally more severe in participants with FM. Generalization of pain are also more frequent in individuals with FM compared to individuals

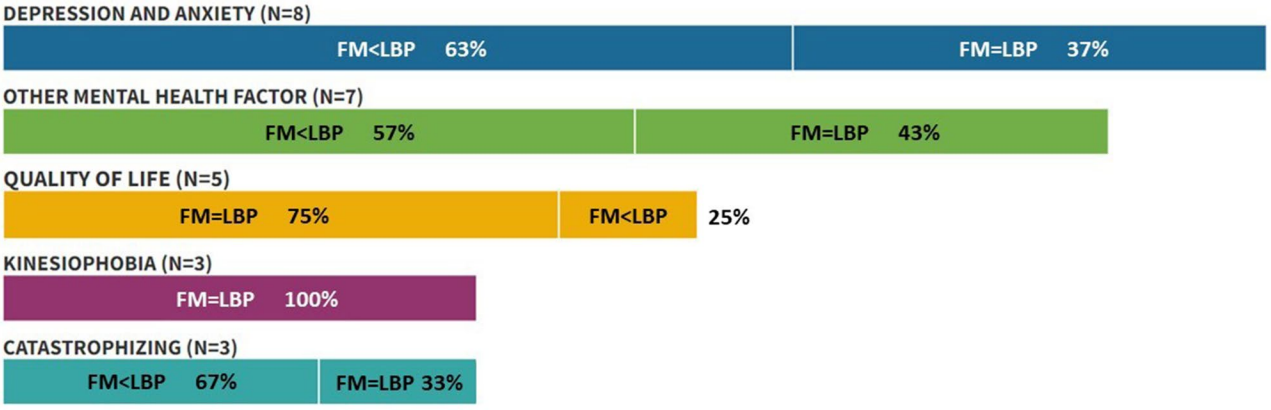

Fig. 6 Proportion of studies showing differences (and no differences) between fibromyalgia and low back pain participants for psychological data scores. Note: FM = fibromyalgia; LBP = low back pain; FM = LBP = psychological data scores are more frequently not significantly different between FM participants and LBP participants ; FM < LBP = psychological data scores are more frequently significantly worst for FM participants

with LBP. Studies comparing individuals with FM and individuals with LBP, however, show similar levels of anger, kinesiophobia, pain intensity, physical limitations, quality of life, quality of pain, social support, and suicidal risk. It is worth noting that our scoping review does not report any pain-related, physiological or psychological outcome for which participants with LBP presented worse scores than participants with FM.

Somatosensory profile

Individuals with FM and individuals with LBP share similarities on pain-related outcomes [33–35, 37–40, 42, 44–46]. In most studies, pain intensity scores were not different between the two conditions [33, 34, 37–39, 46]. However, scientific data using QST protocols confirm that individuals with FM demonstrates higher sensitivity for each pain submodalities, showing generalized hyperalgesia in both superficial and deep tissues [32, 44]. Although individuals with LBP revealed hyperalgesia and sign of central sensitization, it was only exhibited for deep tissues [32]. Consequently, even if pain processing disorders are present in individuals with LBP, it seems that they developed to a lesser degree than in individuals with FM [16, 35, 40]. A continuous stimulation of both facilitatory and inhibitory pathways could be present in individuals with FM, consequently leading to increased and generalized pain if activity of inhibitory pathways decreases or if activity of facilitatory pathways increases [15, 32, 44]. These results suggest that differences in pain processing between FM and LBP could be explained by disinhibition and the involvement of generalized descending control mechanisms in individuals with FM [32, 44].

Influence of psychological factors

Individuals with FM exhibit more frequently lower scores of depression, anxiety [33, 36–38, 41, 44, 45] psychological distress [41, 42, 46] and alexithymia [46] than individuals with LBP. These results partially align with the systematic review by Reis et al. [52] which reported that only depression tends to be associated with the extent of body pain, as part of other psychological factors (psychological distress, kinesiophobia, pain catastrophizing) in chronic pain patients. Individuals experiencing depression tend to report a lower sense of control over their perception of symptoms and more frequent negative thoughts regarding their illness compared to those who are not depressed, leading to worst quality of life scores [33]. Despite most scientific evidence showing worst psychological outcomes in individuals with FM, studies assessed in the present scoping review fail to consistently report significant quality of life differences with individuals with LBP [33, 34, 36, 37]. Compared to other localized chronic pain conditions such as rheumatoid arthritis, osteoarthritis, headache and neck pain, the quality of life of individuals living with FM is known to be lower [53–57]. Also, the impact of pain is more severe for individuals with LBP than individuals with knee osteoarthritis, headache or neck pain individuals [57, 58]. Thus, FM and LBP appear to affect individuals more than other localized chronic pain syndromes regarding the impact of psychological factors and pain experience on quality of life.

Psychological factors could also trigger the development of widespread pain, the primary characteristic of pain in FM individuals [32, 59]. Catastrophizing, depression, and anxiety have been suggested to contribute to the birth, development, and sustainment of central sensitization [20, 60, 61], a predictor of widespread pain [62, 63] consistently found in individuals with FM [15, 32, 35,

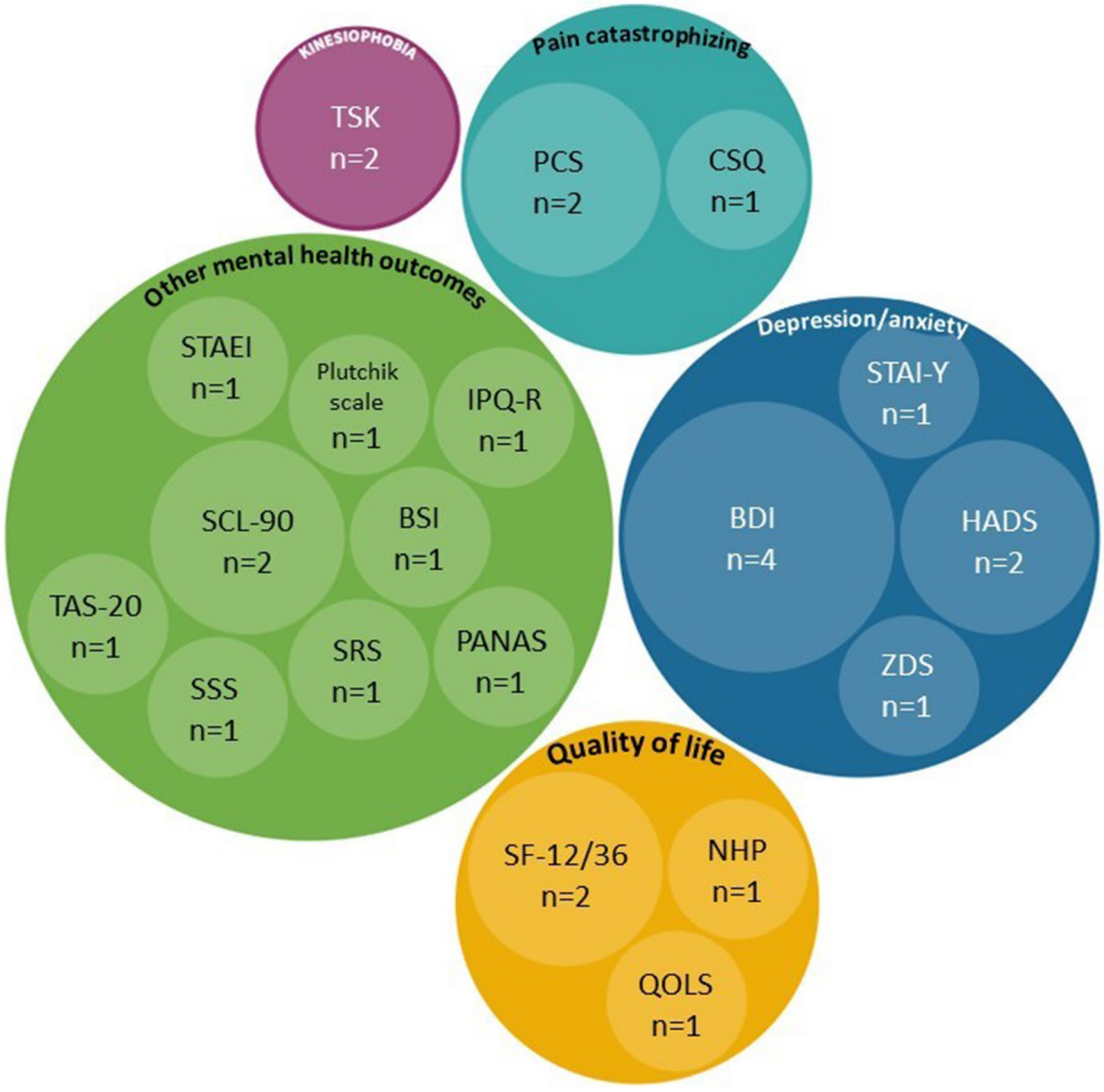

Fig. 7 Type and frequency (number of studies) of the different assessment methods used for every psychological outcome. Note: BDI = Beck Depression Inventory ; BSI = Brief Symptom Inventory ; HADS = Hospital Anxiety and Depression Scale ; IPQ-R = Illness Perception Questionnaire-Revised ; NHP = Nottingham Health Profile ; PANAS = Positive and Negative Affect Schedule ; QOLS = Quality-of-Life Scale ; SCL–90 = Symptom checklist 90 ; SF-12/36 = Short-Form Health Survey ; SRS = Suicide Risk Scale ; SSS = Social Support Scale ; STAEI = State-Trait Anger Expression Inventory ; STAI-Y = Trait Anxiety Inventory-State Y ; TAS-20 = Toronto Alexithymia Scale ; ZDS = Zung Depression Scale

44, 45]. The presence of widespread central sensitization, however, is only found for a subgroup of individuals with LBP [44, 45, 59]. In this scoping review, perceived disability, catastrophizing, depression, and anxiety, are significantly found more severe for individuals with FM [33, 36–38, 41, 44, 45, 47, 48]. Consistent with this scoping review, the systematic review with meta-analysis of Martinez-Calderon et al. [64] found that greater pain related fear and anxiety was associated with greater perceived disability in chronic pain disorders. These clinical factors might distinguish FM from LBP. Whether psychological symptoms predispose to or result from widespread pain remains unknown, but a few authors suggested it might be a bidirectional relationship [35, 59].

LBP positive to FM

Based on the results of Gerhardt et al. [44], Gerhardt et al. [45] and consistent with Aoyagi et al. [59], the present scoping review highlighted the existence of a subgroup of individuals with LBP expressing more severe catastrophizing, anxiety and depressive scores who were positive to a FM diagnostic. According to different authors, this subgroup would be more likely to develop a generalization of pain and symptoms of chronic fatigue, further leading to FM [15, 44]. This is consistent with the observation that

individuals with FM often report the onset of their condition as localized pain (especially back pain) and that FM would be one end of the somatosensory profile spectrum [32, 40, 44, 65].

Precisely identifying this LBP subgroup would allow for tailored treatments for individuals with chronic primary LBP who show signs of FM [66]. Ideally, early identification and intervention based on clinical indicators such as anxiety/depression, catastrophizing, psychological distress, and/or the generalization of pain could even prevent the progression along the somatosensory continuum leading to FM. Longitudinal studies are needed to better understand the trajectory of patients with LBP. Analyzing the evolution of clinical outcomes highlighted as similar between FM and LBP in this scoping review could reveal the existence of a subgroup of individuals with LBP who are "FM-positive" and the somatosensory continuum.

Methodologic issues

This scoping highlights the lack of consistency in the definition of LBP. Many studies did not accurately describe LBP or did not precise how the diagnosis of the condition was made. The definition of LBP must be clarified to accurately identify the populations being studied. Regarding FM, 42% of the studies using the 1990 ACR criteria used them despite the ACR criteria being updated. Although the 1990 ACR criteria helped establish FM as a recognized syndrome, these criteria are the most stringent validated criteria for diagnosing FM, mainly identifying individuals with more severely affected individuals with FM [67]. Galvez-Sanchez and Reyes Del Paso [67] described that the updates of the ACR in 2010, 2011 and 2016 contributed to define FM as a multi-symptom disorder, not only characterized by tender points. Consequently, using the 1990 ACR criteria could lead to the exclusion of less severely affected individuals with FM, and limits generalization of results to individuals with more recent FM diagnostic.

A lack of consistency was also reported for statistical analysis across all studies included in the present scoping review (see Supplementary table). Based on the distribution of results and the number of groups in each study, authors used parametric [30, 31, 33, 37–47] or non-parametric [35, 36] analyses of variances, covariance analyses [32, 34, 41, 44, 45], t-tests [38, 47] or standardized mean differences [48] to compare individuals with FM to those with LBP. Comparing and pooling results of heterogeneous statistical methods represents a challenge, especially when original data are not available. Although significant statistical differences were identified, none of the included studies presented the minimal clinically important difference.

A diversity of methodological tools and measures used to assess the same pain-related, physiological and psychological outcomes was also revealed. This variety in methods, within subcategories such as anxiety, depression, pain sensitivity, and perceived disability, complicates comparability between studies and thus hinders the ability to synthesize findings across research. Based on these results, it seems crucial to standardize physiological and psychological outcomes when comparing participants with either FM or LBP. Standardization would allow for more consistent cross-study comparisons and generalization of the results.

Strength and limitations

To our knowledge, our study is the first scoping review to compile scientific data about participants with FM and participants with LBP compared together. Only multiple comprehensive review compiling scientific data about FM on the one hand and LBP on the other hand, as parts of other chronic musculoskeletal conditions were found [52, 68–77].

Despite the systematic search in multiple databases related to the review topic, only articles publish in English or French were included. One cannot exclude that studies published in an other language were missed in this scoping review. On the other hand, as each database have unique coverage and language preferences, restricting the review to three databases increases the possibility of missing relevant literature. Consequently, such limitations related to databases and languages, may impact the generalizability of the results and the overall conclusions drawn from the present scoping review.

Although caused by original studies extracted in the present scoping review, the authors identified a lack of definition of conditions, misuse of the ACR criteria for fibromyalgia, and significant heterogeneity in measurements of pain-related, physiological and psychological outcomes. Interpretations and conclusions are also based on criteria and definitions that have evolved over the years, thus leading to a challenge in generalizing conclusions for individuals with FM and those with LBP.

Conclusion

Many pain-related, physiological, and psychological similarities are shared between participants with FM and those with LBP. The main findings indicate that, across 19 studies, pain intensity, pain quality, quality of life, and kinesiophobia were frequently similar between the two conditions. However, FM appears more severe in pain catastrophizing, perceived disability, sensitivity to pain, anxiety and depression. These results endorse the hypothesis of some authors considering FM to be a progression from LBP. Longitudinal studies with accurate FM and LBP definitions and standardized assessment methods are needed to analyze the evolution of individuals with LBP and their potential transition to FM.

Supplementary Information

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Supplementary Material 1

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Author contributions
B.C., M.D. and J.A. conceived the study; B.C. and M.T. independently selected and screened articles; B.C. wrote the manuscript draft, analysed and interpreted data; M.D., M.B. and J.A. revised the final version of the manuscript. All authors have read and agreed with the final version of the manuscript.

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Data availability
All data generated or analysed during this study will be available upon request.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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