



The Contribution of the Psychologist in the Assessment and Treatment of Fibromyalgia

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Abstract

Purpose of review This review focuses on the role of psychologists in the assessment and treatment of fibromyalgia syndrome (FMS), a highly prevalent condition characterized by chronic widespread pain, fatigue, cognitive problems, distress, and disability.

Recent findings A large body of work supports the effectiveness and cost-utility of psychological therapies for the improvement of a wide range of symptoms associated with FMS. However, patients with FMS are best assessed and treated by a multidisciplinary team, in which psychologists have an important role. Multidisciplinary treatment, in which each healthcare professional offers his or her own expertise to the patient, has been shown to produce more ubiquitous treatment effects for this complex syndrome than single discipline treatments. Considering the empirical evidence and documented experience of patients, people with FMS can benefit from integrated care, combining education, exercise, and psychotherapeutic approaches, including cognitive-behavioral therapy.

Summary There has been a call for more health economics research to demonstrate the cost-effectiveness of psychological therapies. In this paper, we highlight the added value of psychologists as members of multidisciplinary treatment teams, who can assess and treat the maladaptive cognitive, emotional, and behavioral symptoms that are commonly seen in individuals with FMS.

Fibromyalgia (FMS) is a syndrome of unknown aetiology characterized by chronic widespread pain, fatigue, sleep disturbances, cognitive problems (often referred to as "fibrofog"), and emotional distress [1]. Estimates of the prevalence of FMS in the general population range between 0.2 and 6.6% worldwide [2]. The large variation in these estimates may reflect the inclusion of dissimilar population groups, inadequate sampling, and differences in the criteria used for diagnosing FMS. For instance, in some studies, the designation of FMS has been determined by health insurance group data without further verification, self-reported diagnosis, classification with self-reported instruments, or even with unspecified criteria. Among chronic pain conditions, FMS has the highest unemployment rate, highest disability benefits claim rate, and greatest number of days absent from work [3]. A large body of work has highlighted the high comorbidity of FMS and mental health disorders — mainly mood disorders, anxiety disorders, and post-traumatic stress disorder [4–6].

Currently, there are no curative treatments available for patients with FMS. However, both pharmacological and non-pharmacological approaches can be used to help alleviate the constellation of FMS symptoms. Recent research suggests that the effectiveness of traditional pharmacological approaches are modest in magnitude [7•], so researchers are now testing novel drugs that seem promising [8]. Some systematic reviews and meta-analyses have determined that stand-alone non-pharmacological treatments, including physical exercise, pain neuroscience education, and psychotherapeutic approaches, can provide more ubiquitous benefits than pharmacological approaches for FMS [9, 10, 11••, 12•, 13–15]. However, it has been suggested that improvements in the quality of these RCTs are necessary and that non-pharmacological interventions for FMS should be tailored according to individual patient clusters or profiles [16, 17]. Moreover, there is a call for multidisciplinary treatment approaches for addressing the complexities of FMS [18].

There are many multidimensional patient-reported measures that can be employed in the assessment of the person with FMS to help clinicians better understand the patient's attitudes, beliefs, and experiences [19]. As members of a multidisciplinary treatment team, psychologists are often in the best position to formulate individual clinical cases in detail. In clinical case formulation, the psychologist identifies the predisposing, precipitating, maintaining,

and protective factors for each patient in order to establish treatments goals. A common obstacle faced by healthcare professionals is that most patients with FMS present multiple target problems. Consider the example of a middle-aged patient with FMS who is suffering with excruciating generalized pain, associated depressive symptomatology, multiple psychosocial stressors, and is overweight and physically deconditioned. What should be the primary focus of treatment? In such complex cases, detailed clinical case formulations [20] performed by psychologists can help reach a deep understanding of the patients' problems across time and contexts and identify important and modifiable causal factors. With the aid of science-based measurements, psychologists can help the multi-professional team understand patients' experiences and factors involved in their clinical presentation, specify treatment goals, and develop treatment plans. This paper will focus on the role of psychologists in the assessment and management of patients with FMS, the wide range of psychological factors that are often related to the development and maintenance of FMS symptoms, and ways in which clinical and health psychologists can intervene. This narrative review¹ is structured in the following sections: The role of psychological factors in the development and maintenance of FMS; Psychological measures in the assessment of FMS; Effectiveness of psychological therapies for FMS; and The future of psychology in the assessment and treatment of FMS.

The role of psychological factors in the development and maintenance of fibromyalgia

The specific aetiology of FMS is currently unknown. However, it is widely accepted that altered central and peripheral nervous system processes are involved [21–23]. A primary question is what predisposing or precipitating factors (i.e., infections, vaccination, physical and psychological trauma) contribute to the emergence of these central and peripheral alterations. To shed light on this issue, Yavne and collaborators [24] conducted a systematic review of 51 studies that focused on trauma-related precipitating factors, including physical (20 studies) and psychological (31 studies) trauma. Regarding physical factors, surgery, physical injury, and motor vehicle accidents emerged as common triggers for FMS onset in many studies. Notwithstanding, the temporal causal relationship between

solely physical factors and FMS is difficult to demonstrate because psychological trauma and distress are very likely influencing or mediating this relationship. Concerning psychological factors, the authors found increased rates of prior psychologically traumatizing events in FMS subjects, including sexual/physical abuse and childhood neglect, compared to clinical and healthy controls. However, the general low quality of evidence (assessments based on self-reports, cross-sectional designs, small sample sizes, lack of adequate control groups, etc.) precludes solid conclusions. In a separate systematic review of 37 population-based prospective studies, Creed [25•] found a wide range of risk factors for FMS, including pre-existing medical disorders or other pain disorders, other somatic symptoms, female

¹ Systematic reviews and meta-analyses are considered the gold standard for scientific evidence. They provide a structured synthesis of the evidence about measures or treatments for use with specific patient populations but are less useful when the objective is to synthesize broader concepts as here. A systematic search of electronic databases was not carried out because was considered as unnecessary for the purpose of the present work. This commissioned narrative review sought to summarize the importance of psychological factors and the role of psychologists in the assessment and treatment of fibromyalgia. The present approach is therefore narrative in style, by contrast with the classical systematic review of the literature. This is an intentionally, comprehensive narrative review, aimed at a general audience interested in the role of psychologists in the management of fibromyalgia.

sex (except in those with pre-existing medical conditions), various childhood difficulties, middle-to-older age, smoker, high body mass index, sleep problems, negative health perception, and depression. This author supports the idea of examining causal pathways and mechanisms as related to specific subtypes of FMS rather than assuming a single pathway to the syndrome. More recently, Kaleycheva and colleagues [26•] carried out a pioneering meta-analysis of 19 case-control studies focusing on lifetime stressors in adult FMS subjects. The following factors emerged as significant (effect sizes in decreasing order):

physical abuse, total abuse (collapsing all abuse types), sexual abuse, medical trauma, other lifetime stressors, and emotional abuse. Meta-regression analyses yielded no effect of publication year or study quality on effect sizes. To summarize the results of these meta-analyses, it appears that almost any type of trauma or stressful life event can contribute to the development of FMS.

In the next sections, we put the focus on reliable, valid, and useful psychological instruments for patients with FMS [27] and on some empirically validated psychological therapies for this syndrome [28].

Psychological measures in the assessment of fibromyalgia

The most important mental health assessment tool for evaluating individuals with FMS and other chronic pain conditions is the clinical interview. Patient-reported outcome measures can also provide a valuable addition to the clinical interview. A wide range of patient-reported outcome measures are available for the assessment of persons with FMS; however, this section will specifically focus on psychological measures.

The specific measures used in a test battery are based on a number of factors, including the preferences of the psychologist, the context of the assessment, and the amount of time available for the assessment. Note that it is important to choose measures that are psychometrically validated and published in peer-reviewed journals. It is beyond the scope of this article to provide a comprehensive list of potential useful measures, but in this section, we will provide an overview of some commonly-used psychological measures for FMS assessment (see Table 1). They will be grouped into four broad categories: (1) cognitive, (2) emotional, (3) coping and activity patterns, and (4) relational/contextual. See Table 1 for detailed information about each.

Cognitive variables

Pain catastrophizing has aroused great interest in FMS research due to its clear association with negative pain outcomes [56]. It can be defined as an exaggerated negative “mental set” associated with the actual or anticipated experience of pain [57]. A three-dimensional structure has been proposed, including magnification, rumination, and helplessness. Magnification refers to a disproportionate perception of pain situations and negative expectations about pain. Rumination refers to ruminating thoughts and worries and an inability to inhibit them. Helplessness refers to a perceived lack of control over pain [29, 58]. The most commonly used instrument for assessing this construct is the *Pain Catastrophizing Scale* (PCS), initially developed by

Table 1. Outline of patient-reported psychological measures tested in patients with FMS

<p>1. Cognitive measures</p> <p>1. A. Related to the content of thoughts</p> <p>1.A.1. <i>Pain Catastrophizing Scale (PCS)</i> [29, 30] 13 items grouped into 3 dimensions: rumination, magnification, and helplessness. Responses on a 5-point Likert scale (0–4). Examples of items: When I have pain... “I’m worried all the time wondering if the pain will go away;” “It’s horrible and I feel like this is stronger than me.”</p> <p>1.A.2. <i>Pain Self-efficacy Questionnaire (PSQ)</i> [31, 32] 10 items reflecting a variety of activities of daily living (ADL) tasks and life situations that are frequently reported as problematic for patients living with chronic pain. Responses on a 7-point Likert scale (0–6). Examples of items: “I can enjoy things despite the pain;” “I can live a normal lifestyle, despite the pain.”</p> <p>1.A.3. <i>Self-Efficacy for Physical Activity and Walking Exercise in Women with Fibromyalgia</i> [33, 34] 35 items clustered in seven situations (walking while taking advantage of doing other activities; light, moderate, and vigorous physical activity; brisk walking at least 30, 60, or 90 min) with five barriers included in each situation (pain, fatigue, bad weather, feeling stressed, sad and worried, and having a bad day due to fibromyalgia). Responses on an 11-point Likert scale (0–10). Examples of items: How confident are you that you can “... walk fast to do exercise over 30 min at least twice a week despite experiencing pain,” “...spend at least 30 min doing a light physical activity (not increasing your breathing) like going upstairs or swimming despite feeling fatigue.”</p> <p>1.A.4. <i>Injustice Experience Questionnaire (IEQ)</i> [35, 36] 12 items grouped into 2 dimensions: Blame and Severity domains of perceived injustice. Responses on a 5-point Likert scale (0–4). Examples of items: “I feel as if I have been robbed of something very precious;” “Most people don’t understand how severe my condition is.”</p> <p>1. B. Related to cognitive functioning</p> <p>1.B.1. <i>Multidimensional Inventory of Subjective Cognitive Impairment (MISCI)</i> [37] 10 items grouped into 5 dimensions: mental clarity, memory, attention/concentration, executive functioning, and language. Responses on a 5-point Likert scale (1–5). Examples of items: “I have been able to think clearly without extra effort;” “I had trouble planning out the steps of a task.”</p> <p>2. Emotional measures</p> <p>2.1. <i>The Tampa Scale of Kinesiophobia (TSK)</i> [38, 39] 17 items that are rated on a 4-point scale (1–4). Examples of items: “I am afraid of injuring myself if I do physical exercise;” “If I let myself be defeated by it, the pain would increase.”</p> <p>2.2. <i>Goal Pursuit Questionnaire (GPQ)</i> [40, 41] 14 items that are rated on a 6-point scale (1–6). Examples of items: “...for the pain in my shoulder to be reduced now, than the windows to be cleaned,” “...to read the exciting book now, than to finish the report on time.”</p> <p>2.3. <i>Cognitive Emotion Regulation Questionnaire (CERQ)</i> [42, 43] 36 items grouped into 9 dimensions: Self-blame, Blaming others, Acceptance, Refocusing on planning, Positive refocusing, Rumination, Positive reappraisal, Putting into perspective, and Catastrophizing. Responses on a 5-point Likert scale (1–5). Examples of items: “I think that I have to accept that this has happened;” “I think of what I can do best.”</p> <p>3. Coping and activity patterns</p> <p>3.1. <i>Chronic Pain Coping Inventory-42 (PCI)</i> [44, 45] 42 items grouped into 8 dimensions: guarding, resting, asking for assistance, relaxation, task persistence, exercise/stretching, coping self-statements, and seeking social support. Responses on an 8-point Likert scale (1–7). Examples of items: “Ignored the pain;” “Got support from a friend;” “Rested.”</p> <p>3.2. <i>The Activity Patterns Scale (APS)</i> [46, 47] 24 items grouped into 6 dimensions: pain avoidance, activity avoidance, task-contingent persistence, excessive persistence, pain-contingent persistence, pacing. Responses on a 5-point Likert scale (0–4). Examples of items: “I usually take several breaks so I can do a lot more things;” “I have not been able to carry on with my usual level of activity.”</p> <p>4. Relational/contextual measures</p> <p>4.1. <i>Psychological Inflexibility in Pain Scale (PIPS)</i> [48, 49] 12 items grouped into 2 dimensions: Avoidance and cognitive fusion related to pain. Responses on a 7-point Likert scale (1–7). Examples of items: “I need to know what’s wrong so I can move on;” “I no longer make plans for the future because of the pain.”</p> <p>4.2. <i>Chronic Pain Acceptance Questionnaire (CPAQ)</i> [50, 51] 20 items grouped into 2 dimensions: pain disposition and activity commitment. Responses on a 7-point Likert scale (0–6). Examples of items: “My life is fine even though I have chronic pain;” “Controlling the level of pain is the first priority when I do something.”</p> <p>4.3. <i>Mindful Attention Awareness Scale (MAAS)</i> [52, 53] 15 items measuring the general tendency to be attentive to and aware of one’s experiences in daily life. Responses on a 6-point Likert scale (1–6). Examples of items: “I could be experiencing some emotion and not be conscious of it until sometime later;” “I find myself doing things without paying attention.”</p> <p>4.4. <i>Cognitive Fusion Questionnaire (CFQ)</i> [54, 55] 7 items that are rated on a 7-point scale (1–7). Example of items: “I get so caught up in my thoughts that I am unable to do the things that I most want to do.”</p>

Sullivan et al. (1995) [29] and specifically adapted to FMS populations by García-Campayo et al. [30].

Pain self-efficacy is another variable that has been of wide interest in chronic pain and FMS research, with numerous instruments available for its measurement [59], including the *Pain Self-Efficacy Questionnaire* (PSEQ) and the *Chronic Pain Self-Efficacy Scale* (CPSS) [60]. Of these, the PSEQ [31] has been specifically validated in patients with FMS [32]. The CPSS assesses one's perception of competence in performing functional activities despite pain [61]. Positive self-efficacy has been found to promote healthy lifestyle and exercise behaviors in people with FMS, which ultimately results in better health outcomes [62, 63].

Perceived injustice is a multidimensional construct that includes perceived severity of loss, irreparability of loss, blame, and sense of unfairness [35]. This construct is often measured with the *Injustice Experience Questionnaire* [35], which has shown to be a good predictor of pain-related outcomes [36]. Total scores on this measure have been associated with higher pain severity, pain catastrophizing, fear of movement, depression, and perceived functional limitations in patients with chronic pain [35, 64, 65]. This concept is of special interest in FMS, since many patients feel that their symptoms are not taken seriously by their doctors [36].

Finally, a concept of interest in FMS, commonly referred to as *fibrofog*, involves a perception of dyscognition, including complaints about concentration, memory, mental agility, verbal expression, activity management and scheduling, and generally experiencing life through a haze [66]. This condition can significantly interfere with daily functioning in patients with FMS [67]. Research has shown that perceived dyscognition is related not only to objective cognitive impairments [68], but also to other types of symptoms associated with FMS, such as emotional distress, fatigue, unrefreshing sleep, and mood alterations [67, 68]. The *Multidimensional Inventory of Subjective Cognitive Impairment* (MISCI) [37] has been devised as a brief and comprehensive self-report measure of cognitive function in FMS.

Motivational and emotional variables

The concept of pain-related fear proposes that for some patients, a painful experience will lead to fear of movement and avoidance behaviors as a maladaptive way of coping with pain, resulting in physical deconditioning and disability [69]. Numerous studies have examined the applicability of this cognitive behavioral model in people with FMS, especially for its implications in receptiveness and adherence to physical exercise [70]. Fear of performing physical activities or body movements has been described with a variety of conceptual definitions, among which pain-related fear, fear-avoidance beliefs, fear of movement, and kinesiophobia are the most commonly used [69, 71]. Pain catastrophizing, fear of movement, and activity avoidance, which are key factors in the fear-avoidance model of pain [72, 73], have repeatedly predicted increased emotional distress, perceived level of disability, and interference with daily activities [73]. The *Tampa Scale of Kinesiophobia* (TSK-17) [38, 39] (with its different versions, including 11 and 13 items) is a commonly used measure of this variable.

It has been suggested that motivation towards healthy behaviors is a result of the interaction between goal preferences and mood [40, 74]. In this context, patients with FMS are often subject to goal conflicts [75] such as the preference for short-term hedonic goals (i.e., pain avoidance) vs. long term achievement goals (i.e., to start, maintain, and accomplish an activity). Karsdorp and Vlaeyen [40] developed the *Goal Pursuit Questionnaire* (GPQ) in people with musculoskeletal complaints to identify the individuals' goal pursuit tendency for hedonic or achievement goals. A two-factor structure has been determined, including pain avoidance goals and mood-management goals. Pastor and colleagues [41] have validated a Spanish version of the GPQ in patients with FMS.

Emotional regulation refers to "the extrinsic and intrinsic processes responsible for monitoring, evaluating and modifying emotional reactions, especially their intensive and temporal features, to accomplishing a one's goals" [76]. This construct is not only related to the emotional symptoms that are often present in FMS, but also to its association with other common FMS symptoms, including pain, fatigue, cognitive dysfunctions, and functional impairments [76, 77]. Impaired emotional regulation is a transdiagnostic risk factor that has been implicated in many disorders, including those related to mood, anxiety, substance use, personality, and eating [78]. Focusing on the self-regulatory and cognitive components of emotional regulation, Garnefski et al. [42] developed the *Cognitive Emotion Regulation Questionnaire* (CERQ), which evaluates eight emotional regulation strategies that people tend to use after negative life events: self-blame, blaming others, acceptance, refocusing on planning, positive refocusing, rumination, positive reappraisal, putting into perspective, and catastrophizing.

Coping and activity patterns

People can use a variety of strategies to help cope with unpleasant situations. Coping strategies have been defined as "cognitive and behavioral efforts to master, reduce, or tolerate the internal and/or external demands that are created by the stressful transaction" [79]. Many researchers suggest that negative affective states, often resulting from chronic life stressors, can trigger FMS symptoms [80, 81]. Some have gone further, proposing that FMS is an affective disorder [82]. High levels of pain and the inability to control it are sources of stress in themselves that can reduce a person's capacity to cope effectively, and consequently, lead to depression [83]. For this reason, and in accordance with the transactional theory of Lazarus & Folkman, the analysis of the coping strategies may be helpful in the assessment of persons with FMS. The *Chronic Pain Coping Inventory-42* [44] assesses coping strategies related to chronic pain in general and FMS in particular [45].

Chronic pain syndromes, including FMS, can have a negative effect on one's ability to function with activities of daily living, so it can be helpful to analyze individual activity patterns [84]. Classically, three groups of activity patterns have been identified: avoidance (reducing activities to avoid present or future pain), pacing (regulating the intensity and duration of the activity to help manage pain symptoms), and persistence (frequent overdoing: engaging

in activities without considering one's physical limits, potentially resulting in negative consequences such as pain flare-ups) [85]. It has been found that overdoing strategies, and especially avoidance behaviors, are associated with worse pain-related outcomes [86]. The relationships of pacing and persistence remain less clear, showing that, far from deterministic models, the function and effects of activity patterns must be conceptualized within more complex models such as those established by cognitive flexibility models [87].

Relational/contextual variables

A psychological flexibility model [88] has been proposed as a unifying framework for understanding functioning in patients with FMS [89]. Psychological flexibility refers to the ability to cope with, accept, and adjust to difficult situations and to persist or change one's behavior by incorporating conscious and open contact with thoughts and feelings while being consistent with one's personal values and goals [90]. Within this model, psychological variables and activity patterns are not determined to be functional or dysfunctional per se, and their effects on disability are primarily related to underlying personal goals and contextual factors [91]. In this sense, the psychological flexibility model suggests that some contextual and personal variables could explain the inability of some individuals to implement adaptive coping methods in the presence of pain or related symptoms [92]. The following measures can be helpful in assessing psychological flexibility. The *Psychological Inflexibility in Pain Scale* (PIPS) [48, 49] — Psychological inflexibility is a pattern in which behavior is excessively controlled by one's thoughts, feelings, and other internal experiences, or the avoidance of these experiences, at the expense of more effective and meaningful actions [92, 93]. The *Chronic Pain Acceptance Questionnaire* (CPAQ) [50, 51] — Pain acceptance is defined as the willingness to experience continuing pain without efforts to reduce, avoid, or otherwise change it. The *Mindful Attention Awareness Scale* (MAAS) [52, 53] — Mindfulness is defined as "the presence or absence of attention to, and awareness of, what is occurring in the present moment" [52]. The *Cognitive Fusion Scale* (CFS) [54, 55] — Cognitive fusion refers to the degree to which a person is entangled with their own thoughts and takes them literally [54].

Effectiveness of psychological therapies for fibromyalgia

As seen in previous sections, psychological components are fundamental to help explain the onset and course of FMS. As a consequence, researchers and clinicians are increasingly interested in testing the effectiveness of psychological therapies for FMS. This section will review the existing evidence of clinical- and cost-effectiveness of psychological therapies for FMS.

After almost three decades of research, we now have sufficient evidence to support the effectiveness of psychotherapy for FMS, as reflected in systematic reviews and meta-analyses. In fact, the majority of institutional guidelines,

including the American Pain Society, the Canadian Pain Society, and the Association of the Scientific Medical Societies in Germany, give cognitive behavioral therapy (CBT) the maximum level of evidence for the treatment of FMS ("Strong for" or grade A with consistent evidence based on systematic reviews and meta-analyses) [94]. An exception to this are recent guidelines from the European League Against Rheumatism [95], which only gives the maximum level of evidence to exercise therapy and rated the evidence for CBT and all other treatments, including pharmacological and multicomponent treatments, as "Weak for." This latter expert opinion synthesis has been criticized for overlooking psychotherapy in favor to exercise therapy only, for failing to include psychologists or psychosocial researchers in the reviewer committee [94] and for omitting studies that have supported strong evidence for CBT in FMS [96, 97]. It is important to note, however, that the European League Against Rheumatism does recommend CBT for persons with mood disorders, poor coping strategies [95], and high levels of catastrophizing [98]. All guidelines agree that management of FMS should focus on non-pharmacological treatment options first and should actively involve patients in the treatment process in order to gain self-management abilities [94]. These conclusions are based on treatment availability, safety, as well as patient preferences and treatment costs.

Indeed, psychotherapy, and particularly CBT, has been shown to be a very cost-effective treatment option for people with FMS. A recent systematic review and meta-analysis of 11 RCTs indicated that psychotherapy resulted in significantly lower health care and societal costs, compared to usual pharmacological care when compared over 6- and 12-month periods of treatment [11••]. As indicated in this review, the increased cost-effectiveness of CBT and its impact on quality-adjusted life-years, compared with other active interventions such as pharmacotherapy and non-active controls, require more research but are relatively robust. In addition to CBT, other forms of therapy are also gaining ground in the management of FMS. Two clear examples of these are Mindfulness-Based Stress Reduction and Acceptance and Commitment Therapy, which will be reviewed later in this section.

CBT principles and evidence for the management of fibromyalgia

CBT is the psychological treatment of choice for patients with chronic pain in general and FMS in particular [99, 100]. This approach emphasizes the role of behaviors and cognitive interpretations of situations. Thus, cognitive factors (e.g., thoughts and beliefs) play a fundamental role in therapy under the assumption that they largely determine the emotional and behavioral responses that will occur under different situations. A basic assumption is that people with chronic pain conditions, including FMS, can hold certain negative beliefs about their pain (e.g., "I am unable to function properly as a result of my pain") and often perceive that they have no resources to improve their situation (e.g., "there is nothing I can do to reduce my pain"). As a consequence, some individuals present a pattern of dysfunctional behavioral responses (e.g., avoidance of activities of daily living) and negative emotions (e.g., sadness), which makes it easier for negative pain-related thoughts and

behaviors to dominate the person's life. The goal of CBT is therefore to help patients learn to identify and modify distorted and dysfunctional thoughts, beliefs, and behaviors, and to help them realize that, in many cases, they have the ability and strength to deal with their daily pain-related problems more effectively. Within a CBT treatment model, pain-related emotional distress (e.g., depression, anxiety, or anger) and maladaptive behaviors (e.g., avoidance) are seen as largely influenced by cognitive variables (e.g., attention, expectations, beliefs, and memories). Consequently, during CBT patients are trained to (1) identify the most recurrent maladaptive thoughts about pain and (2) recognize the connection between their thoughts and their emotional and behavioral responses. Next, they are trained to (3) challenge these maladaptive thoughts and change them to more functional ones that allow (4) the use of more effective coping strategies that reduce the emotional discomfort associated with pain [101].

Meta-analytic data from over a decade ago [97] suggests that CBT has small-to-medium, but robust and lasting effects on a wide range of pain-related symptoms, including pain intensity, functional status, sleep problems, depression, and catastrophizing (Hedges' *g* between 0.33 and 0.47). These results are at least comparable to the effects of pharmacotherapy, but psychotherapy has an important advantage because of its safety [95] and long-lasting effects [96], which are visible in the brain of up to 6 months after treatment [102].

Treatment of fibromyalgia with new forms of CBT

While CBT has attracted the most psychological treatment research into FMS, research has also pointed to more behavioral approaches as sources of effective symptom management in this syndrome [96]. In this section, we will review the evidence for Acceptance and Commitment Therapy (ACT) and Mindfulness-Based Stress Reduction (MBSR), which are more modern and behaviorally focused forms of psychotherapeutic interventions.

Chronic pain and FMS can impose important challenges for the person's sense of identity, causing some individuals to lose, on many occasions, the meaning of life by disconnecting him/her from valued activities [103, 104]. Most pain treatments aim to heal or control pain and other associated symptoms [105]. However, patients with FMS often find traditional treatments to be ineffective [106]. Therefore, some patients rely on strategies like activity avoidance to control pain, which can have a dramatic negative effect on their psychological and physical health, life goals, and ultimately their sense of identity [107].

Unlike many other treatments for chronic pain, including traditional CBT, ACT does not seek to heal or control the pain or other related symptoms [108]. With ACT, the main goal is to disconnect people from their fight against pain and other symptoms and connect them with their values and the means to achieve their goals. The focus, therefore, lies in helping patients acquire effective behavior patterns, guided by the goals and values that they consider most important. A new way of living with pain can be achieved by changing the way people experience their sensations, thoughts,

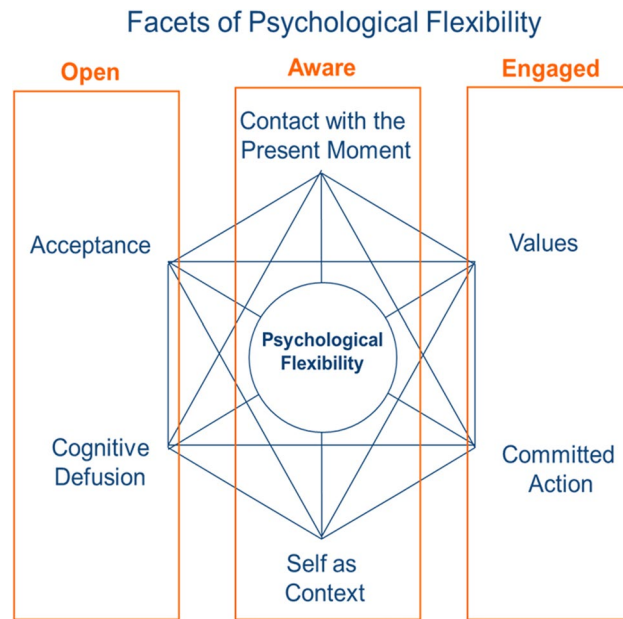


Fig. 1 The six core processes in Acceptance and Commitment Therapy (ACT)

and feelings without changing the actual sensations, thoughts, and feelings per se [109, 110]. Acceptance, cognitive defusion, committed action, mindfulness, self as an observer, and values have been suggested as the six processes underlying psychological flexibility (see Fig. 1). Within the ACT therapy model, patients are trained and encouraged to participate in positive behaviors, including these six processes, which are incorporated during the whole treatment process [111]. So far, treatment outcome evidence for ACT is similar to that obtained with CBT, in the form of small-to-moderate effects on pain levels, depression, anxiety, sleep quality, and health-related quality of life, but the reduced number of RCTs ($n=3$) and the weakness of control conditions (i.e., generally waiting list or education groups) limits the reliability of findings [112].

MBSR taps into a core dimension of ACT, namely mindfulness (contact with the present moment), and trains individuals to sustain attention to sensory, cognitive, and affective internal events, recognize their transitory nature, and reduce judgment and reaction to these experiences [113, 114]. Results so far suggest that MBSR might be effective in reducing pain-related symptoms, including pain severity, catastrophizing, anxiety, depressed mood, and stress [115]. However, results have also indicated that these findings are modest in magnitude, especially when compared with active controls or pharmacotherapy, so its inclusion with multicomponent treatment protocols has been recommended [115]. As with ACT, the number of RCTs with MBSR is also limited and has included a reduced number of patients [112]. More quality research is needed to determine the extent to which isolated mindfulness programs or multicomponent interventions that integrate mindfulness techniques are effective forms of psychotherapy for persons with FMS.

Towards the sustainability of psychotherapy for fibromyalgia

Though psychotherapy is a cost-effective option for FMS, the costs of individual therapy in terms of economic expenditures and accessibility have led to the emergence of novel forms of psychotherapy, that is, internet-delivered psychological treatments [116]. Research on the effectiveness, acceptability, and safety of Internet-based psychotherapy is still scarce, and long-term effects are yet to be explored [96, 112, 117]. Meta-analytic data have provided preliminary support for the effectiveness of internet-based psychotherapy, with improvements in disability and negative mood, even when compared with active control groups [117]. These results are not only applicable to Internet-delivered CBT (iCBT), but also to other forms of therapy, such as internet-based exposure treatment [118] and internet-delivered ACT [119, 120].

Personalizing treatments for fibromyalgia

Tailored interventions seem to be particularly important for FMS [121]. Research has repeatedly revealed that patients with FMS do not form a homogeneous group and that different adaptation styles exist according to their psychological profile (e.g., emotional status, attributional styles, and coping patterns) [122, 123]. Therefore, treatment interventions should be geared towards the patient's individual needs, with flexible adaptations throughout the therapy process, based on the patient progress, using measurement-based care with routine outcome monitoring [124].

Internet interventions can help in this attempt to personalize treatments in FMS. For example, a recent study proposed that the most effective interventions for this condition are those that consider the patient's clinical severity status and the patient's treatment preferences prior to the intervention [125]. For example, a stepped care model provides the least resource-intensive treatments first, and treatment is "stepped up" to more demanding interventions only when required according to the patient's needs [126]. Internet psychological interventions could represent a first treatment option when patients experience mild impairment and only stepped up to more intensive and demanding interventions (e.g., group or individual therapy), if patients do not respond or clinical severity increases [127].

Final remarks in relation to psychotherapy for fibromyalgia

As reviewed previously, research supports the implementation of CBT and potentially newer forms psychotherapy, such as ACT, as first-line interventions for the management of a wide range of symptoms in FMS, especially as part of a multidisciplinary team approach. However, some barriers in research have been detected. First, the quality of some CBT trials FMS has been poor, especially in terms of safety assessment and weak control groups [95]. The problem of over-relying on face-to-face interventions and fixed treatment protocols that ignore the heterogeneity of FMS has also been discussed. It is important to define subgroups (i.e., clusters) based on symptomatology (e.g.,

severity of depression and anxiety, functioning levels, and avoidance of pain) and tailor treatments to these subgroups [96]. As a final note, we would like to encourage researchers and particularly clinicians to shift to alternative treatment designs that consider individual treatment effects, such as single case designs. While RCTs with well-balanced samples are important, they generally focus on average group effects, which ignore the effects of an intervention on the individual. Single case designs are becoming increasingly popular in general chronic pain research [128, 129] and in FMS research [130], including internet psychological interventions [131].

The future of psychology in fibromyalgia

As we have reviewed in the previous sections, psychological interventions can provide significant benefit for those with FMS. However, there are many challenges, such as how to deal with the complexity of this syndrome, individualize treatment plans to best meet patient needs, identify processes of therapeutic change, and generally design treatments that produce the largest benefits for the most people with FMS [132••, 133].

Single, strong, reliable predictors of treatment outcome success have been difficult to identify in people with chronic pain [134]. This also appears to be the case in FMS, where highly complex multivariate models can perform reasonably well, but their clinical utility may be limited, and where simpler models do not seem adequate [135]. Similarly, familiar variables such as catastrophizing are shown to significantly predict some outcomes, but not all, and not typically with strong effects [136]. It may be that current treatment designs and group-based research methods are limited for identifying who will benefit and who will not [137].

People with FMS entail a highly heterogeneous group in terms of clinical presentation, underlying pathophysiology, and “behavioral pathology” [125]. Early attempts to study FMS subgroups, using the Multidimensional Pain Inventory, produced some success, showing first that patients attending interdisciplinary treatment for FMS can be classified into one of three empirically derived subtypes (“dysfunctional,” “interpersonally distressed,” or adaptive copers”) prior to treatment and that these groups show remarkably different responses to the same treatment intervention [138]. Most of those classed as dysfunctional prior to treatment were reclassified as adaptive copers after treatment, while most of those initially classed as interpersonally distressed remained so. Despite this positive example and how compelling it is to consider the notion of different treatments for different people, an early review looking at subgroup treatment responses concluded that there was limited evidence for subgroup effects, although the review only included studies published prior to August 2014 [139].

Another way to address heterogeneity in FMS is to design and test tailored treatments that focus on specific subgroups and/or customize treatment content for particular patient needs. In one example of this approach, patients with FMS and high levels of distress were recruited as “high risk” and were further assessed and identified as either pain avoidant or pain persistent and provided a tailored treatment accordingly [140]. Treatment effects were significant for all primary outcomes, including physical and psychological functioning, for the treatment conditions compared to a waitlist control condition. Within-group effects were large and results appeared clinically significant. Tailored treatments have also been demonstrated to be beneficial in patients with chronic pain and comorbid anxiety and/or depression [141].

Limitations in current attempts at treatment tailoring include an absence of studies that compare tailored treatments to untailored treatments. While tailored treatment also appears beneficial in CBT for anxiety and depression, for example, there is limited evidence that tailoring produces superior results to untailored treatments [142]. Another limitation in approaches to tailoring so far is that they typically use subtyping, simply creating small groups, and do not truly individualize as such. A question remains as to how to best assess cases and assign treatment components dynamically, on an ongoing basis, during treatment.

Recent studies of processes of change in FMS employ methods conventionally used in the wider field, including mediation analyses applied in RCT designs. In one example, session-to-session measures of psychological inflexibility, catastrophizing, and pain intensity were examined as potential mediators of treatment outcomes in pain interference in a trial of ACT versus applied relaxation [143]. It was found that psychological inflexibility mediated the effects of outcomes in ACT but not applied relaxation and neither catastrophizing nor pain mediated changes in either. Another study example involved an RCT of a positive affect intervention called “best possible selves” [144]. Here, it was found that depression mediated change in pain interference and positive and negative affect mediated changes in depression and quality of life. An argument leveled against the conventional approach to identifying processes of change via mediation analysis is that it is probably too coarse and unlikely to successfully identify processes that are multivariate, bidirectional, and highly individual [133].

In summary, the questions relevant in guiding future directions in FMS, to paraphrase well known previous advice, can be summarized as who benefits, from what methods, and how does that happen [145]. It has been recommended that future directions in research should pursue methods to reveal individual patient treatment needs, deliver treatments designed specifically to meet these needs, and do this based on evidence-based processes of therapeutic change [132••, 137]. An identified limitation in current studies addressing the questions raised here is that they are probably not individualized enough, adhering to subtypes rather than individual people, employing group designs, and collecting data from limited time points. Truly individual, intensive, longitudinal study designs are recommended for future studies of psychological treatment for FMS.

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Declarations

Conflict of interest

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Human and animal rights and informed consent.

This article does not contain any studies with human and animal subjects performed by any of the authors.

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- Of major importance

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