

# Psychological impact of fibromyalgia: current perspectives

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**Abstract:** Fibromyalgia syndrome (FMS) is a chronic disorder characterized by widespread and persistent musculoskeletal pain and other frequent symptoms such as fatigue, insomnia, morning stiffness, cognitive impairment, depression, and anxiety. FMS is also accompanied by different comorbidities like irritable bowel syndrome and chronic fatigue syndrome. Although some factors like negative events, stressful environments, or physical/emotional traumas may act as predisposing conditions, the etiology of FMS remains unknown. There is evidence of a high prevalence of psychiatric comorbidities in FMS (especially depression, anxiety, borderline personality, obsessive-compulsive personality, and post-traumatic stress disorder), which are associated with a worse clinical profile. There is also evidence of high levels of negative affect, neuroticism, perfectionism, stress, anger, and alexithymia in FMS patients. High harm avoidance together with high self-transcendence, low cooperativeness, and low self-directedness have been reported as temperament and character features in FMS patients, respectively. Additionally, FMS patients tend to have a negative self-image and body image perception, as well as low self-esteem and perceived self-efficacy. FMS reduces functioning in physical, psychological, and social spheres, and also has a negative impact on cognitive performance, personal relationships (including sexuality and parenting), work, and activities of daily life. In some cases, FMS patients show suicidal ideation, suicide attempts, and consummated suicide. FMS patients perceive the illness as a stigmatized and invisible disorder, and this negative perception hinders their ability to adapt to the disease. Psychological interventions may constitute a beneficial complement to pharmacological treatments in order to improve clinical symptoms and reduce the impact of FMS on health-related quality of life.

**Keywords:** fibromyalgia, background, psychological impact, patients' experiences, personality, mood

## Introduction

Fibromyalgia syndrome (FMS) is a chronic disorder characterized by widespread and persistent musculoskeletal pain that predominantly affects women (between 61% and 90%)<sup>1</sup> and has an estimated prevalence of 2%–4% in the general population.<sup>2</sup> Other associated symptoms are fatigue, insomnia, morning stiffness, depression, and anxiety.

FMS is frequently accompanied by other conditions such as irritable bowel syndrome, headache, fever, diarrhea, oral ulcers, dry eyes, vomit, constipation, skin rash, hearing difficulties, hair loss, painful and frequent urination, etc.<sup>2</sup> FMS is associated with high socioeconomic costs for the health system (medical visits, specialized consultations, diagnostic tests, drugs, and others therapies) and the workforce (sick

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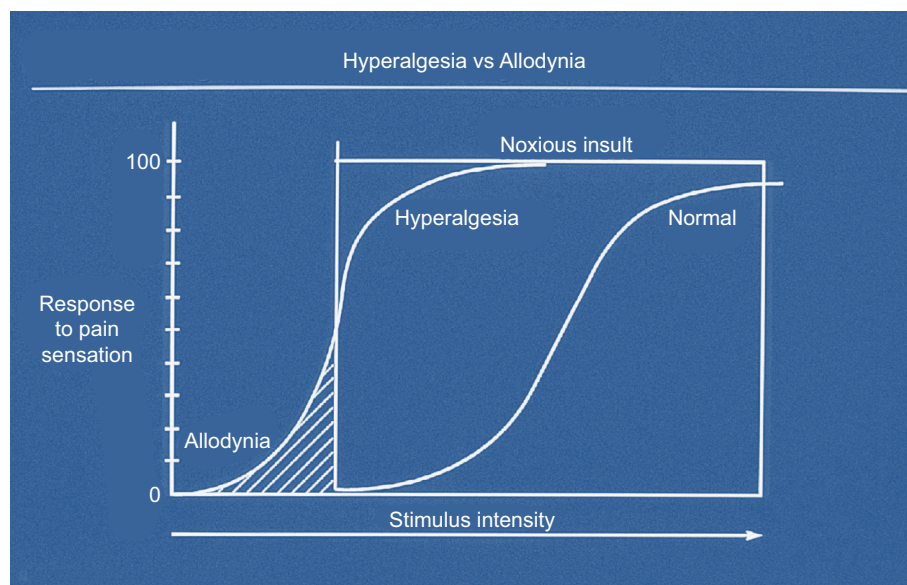
leave, high rate of absenteeism, and decreased work-related productivity).<sup>3,4</sup>

FMS was recognized as an illness by the WHO in 1992, being included in the ICD-10 under code number M79.<sup>5</sup> The etiology of FMS remains unknown. Current pathophysiological models assume a central sensitization to pain and impairments in endogenous pain inhibitory mechanisms<sup>4,6-8</sup> (Figure 1). This idea is supported by the existence of hyperalgesia and allodynia, low thresholds and tolerance to pain, development of pain sensitization in the dorsal horns of the spinal cord in response to repeated pain, and greater brain responses to pain evocation observed in areas of the pain neuromatrix.<sup>6-8,10,11</sup> However, other authors have considered neurological origin of FMS, based on the discovery of small fiber<sup>12,13</sup> and large fiber<sup>14</sup> neuropathy in the affected patients.<sup>12</sup> Moreover, the involvement of idiopathic cerebrospinal pressure dysregulation in FMS pathology is discussed.<sup>15</sup> In 1990, the American College of Rheumatology (ACR) established the first diagnostic criteria for FMS, wherein pain pressure up to 4 kg/cm<sup>2</sup> was evaluated at 18 body points; pain elicited in at least eleven of them was required for a diagnosis.<sup>16</sup> However, these criteria were widely criticized due to the difficulties in using pressure algometry in primary health care and the limited predictive validity with respect to clinical pain.<sup>17</sup> Thus, in 2010, a new proposal was presented by the ACR exclusively based on the use of two scales: the Widespread Pain Index (WPI) and the Severity Scale (SS). The WPI includes a list of 19 painful areas and the SS involves an evaluation of the severity of certain clinical symptoms. For an FMS diagnosis, a WPI score  $\geq 7$  and

SS score  $\geq 5$  or a WPI score between 3 and 6 and SS score  $\geq 9$  is needed. As with 1990 criteria, the symptoms must be present continuously over the period of at least 3 months.<sup>2</sup>

## Vulnerability factors in fibromyalgia

Some factors seem to predispose individuals to FMS, such as accidents (traffic and work injuries, fractures, polytraumas), medical interventions and complications (such as from surgeries and infections), and emotional traumas (sexual and physical abuse and neglect).<sup>18-20</sup> Environmental factors like stressful life events may be associated with FMS onset.<sup>21,22</sup> FMS patients who report sexual or physical abuse tend to experience poorer psychological adjustment, greater psychological distress, and more severe clinical symptoms, and use more health care services.<sup>23-25</sup> In general, studies have found an association between traumas during childhood and adolescence (not only abuse or violence, but also negligence and other negative life events) and level of disability in FMS.<sup>26</sup> Dysregulation of stress response mechanisms may antecede the development of FMS and other chronic conditions like chronic fatigue syndrome. Early stress in human development could alter stress mechanisms, leading to increased vulnerability to stress-related disorders. As such, lengthy trauma or life stress in childhood and adulthood seems to negatively affect brain modulatory systems, of both pain and emotions.<sup>27</sup> Though life experiences may partially explain the high prevalence of emotional disorders and alterations in pain modulation in FMS, the corresponding state of research does not allow definite conclusions.



**Figure 1** Hyperalgesia and allodynia.

**Note:** Reprinted from *Current Biology*, 8(15), Martin WJ, Malmberg AB, Basbaum AI, Pain: nocistatin spells relief, R525–R527, Copyright (1998), with permission from Elsevier.<sup>9</sup>

FMS patients show blunted HPA (hypothalamus–pituitary–adrenal) reactivity (particularly at the pituitary level), which leads to an inappropriate cortisol response to stress or activities of daily living.<sup>28,29</sup> FMS patients also displayed aberrant autonomic regulation<sup>17</sup> with lower activity of both the sympathetic and parasympathetic branches (such as higher heart rate and lower heart rate variability, blood pressure, stroke volume, etc) and reduced reactivity to physical and psychological stressors.<sup>30,31</sup> This leads to a reduced capacity to face and cope successfully with environmental and daily life demands. Furthermore, the activity of the baroreflex, the main mechanism mediating the antinociceptive effect of blood pressure, is decreased.<sup>26,27</sup> Moreover, the negative effect of negative life events seems to be enhanced and maintained due to the patients' tendency toward catastrophizing,<sup>10</sup> avoidance, or inhibition of their emotions.<sup>32</sup>

Physical inactivity and sedentary lifestyles, and the associated increase in body mass index (BMI), have been suggested as factors associated with FMS.<sup>33,34</sup> Activity avoidance is associated with poorer function in individuals with chronic pain, and predicted poorer physical and psychological functioning and higher pain-related interference with daily life.<sup>35</sup> Overactive patterns can also contribute in the long term to increased risk of pain exacerbation, and patients with an overactive coping style when engaging in daily life activities usually report poorer physical and psychological function.<sup>35</sup> In contrast, patients who pace themselves (such as by slowing down and taking breaks to facilitate goal attainment) in their daily activities report lower pain interference and greater psychological function and pain control.<sup>35</sup>

Family aggregation in FMS, suggesting genetic influences, has been observed.<sup>36–38</sup> There is a greater prevalence of mood disorders (especially major depressive and bipolar disorders) and reduced pressure pain thresholds in the relatives of FMS patients. However, the specific genes and mechanisms of transmission are unknown, although they are probably polygenic, for instance, HLA antigen class I and II, DR4, 5-HTT, 5-HTTLPR, D2 receptor, catechol-O-methyltransferase polymorphism, etc.<sup>36,37</sup>

In spite of the evidence regarding the abovementioned predisposing factors (which cannot be considered causal), more research is needed to comprehensively understand their contribution to FMS origin and maintenance.<sup>39</sup>

## Impact on health-related quality of life

FMS negatively affects functioning at the physical, psychological, and social levels, impairing social relationships,

ability to fulfill family and work responsibilities, daily life activities, and mental health, not only due to pain but also because of fatigue, cognitive deficits, and other associated symptoms.<sup>40–42</sup> The quality of life of relatives can also be affected. Work is especially affected due to the tension between health problems (pain, fatigue, muscle weakness, limited physical capacity, increased stress, and increased need of rest) and work-related demands.<sup>43,44</sup> It is important to provide familial and general social support to FMS workers, taking into account the fact that working patients show better health status and adaptation than non-working patients.<sup>45,46</sup> FMS patients should have the opportunity to adjust their work situation and workload according to their reduced physical capacity for fulltime work, or decide definitively if they can or cannot work.<sup>47,48</sup> In this vein, the WHO recommends workplace adjustments for health reasons.<sup>49</sup>

FMS negatively affects sexual health<sup>50</sup> and is related to reproduction problems<sup>51</sup> and female sexual dysfunctions,<sup>52,53</sup> such as hypoactive sexual desire,<sup>54</sup> sexual aversion, orgasm disorder, vaginismus, and dyspareunia.<sup>55</sup> Characteristic FMS symptoms (particularly widespread pain, fatigue, sleep disorders, and hypersensitivity and intolerability to tactile and pressure stimuli)<sup>56</sup> together with psychiatric comorbidities<sup>57</sup> (especially anxiety and depression),<sup>58,59</sup> body image problems,<sup>60</sup> decreased lubrication,<sup>61</sup> pelvic floor muscle problems,<sup>62</sup> and medication side effects,<sup>63</sup> are some of the main causes of sexual problems (Table 1). With a multidisciplinary approach, it is necessary to treat sexual problems in FMS, as they are not only a cause of discomfort, which worsens symptoms and quality of life, but also lead to interpersonal problems and the breakup of couples.<sup>64</sup>

## Cognitive impact of fibromyalgia

Lower cognitive performance has been found in FMS patients compared to healthy people.<sup>33,65,66</sup> FMS patients usually report cognitive impairments, especially problems in planning, attention, memory (in the working, semantic, and episodic domains), executive functions, and processing speed.<sup>33,67,68</sup> These findings accord with self-reported cognitive deficits, which usually include concentration difficulties, forgetfulness, decreased vocabulary, poor verbal fluency, and mental slowness.<sup>69,70</sup> Nevertheless, the cognitive deficit does not seem to be global.<sup>71</sup> Additionally, higher levels of fatigue have been found during cognitive tasks in FMS patients compared to healthy people.<sup>72</sup>

The main mediating factor of these cognitive deficits is the severity of clinical pain.<sup>73–75</sup> Secondary explanatory factors are emotional-affective problems (particularly anxiety,

**Table 1** Biological and psychosocial aspects of FMS sexual dysfunctions

<b>Biological aspects</b>
Chronic widespread pain
Hypersensitivity and intolerability to tactile and pressure stimuli
Fatigue
Sleep problems
Stiffness
Vaginismus, vulvodynia, pelvic pain, coccydynia, interstitial cystitis, etc
Irritable bladder
Pre-menstrual syndrome
Lubrication problems
Pelvic floor muscles affectation
<b>Psychosocial aspects</b>
Psychiatric comorbidities (particularly anxiety and depression, post-traumatic stress disorders)
Medication side effects (eg, antidepressants and anxiolytics)
Negative body images
Pain catastrophizing
Alexithymia
Communication and confidence problems with partners
Sexual abuse history
Chronic stress
Problems in pre-morbid sexual functioning
Negative self-image

**Abbreviation:** FMS, fibromyalgia syndrome.

depression, and negative emotional states),<sup>76,77</sup> fatigue, and insomnia.<sup>78–80</sup>

## Emotional and affective impact of fibromyalgia

FMS is linked to greater negative affect,<sup>74–76</sup> which involves a general state of distress composed of aversive emotions like sadness, fear, anger, and guilt.<sup>77</sup> In addition, FMS patients tend to experience high levels of stress,<sup>78,79</sup> anger (including anger-in or anger suppression, anger-out or anger expression, and angry rumination),<sup>80–82</sup> and pain catastrophizing (conceptualized as an exaggerated negative orientation to pain, which provokes fear and discomfort and increases pain perception),<sup>83</sup> which are frequently associated with a worsening of symptoms,<sup>84</sup> including cognitive ones.<sup>66</sup>

Psychiatric disorders can accompany rheumatic diseases and may increase disability and mortality, as well as reduce quality of life in these patients.<sup>85,86</sup> FMS patients display a high rate of anxiety (20%–80%)<sup>87</sup> and depressive disorders (13%–63.8%).<sup>88</sup> Specifically, a higher prevalence in FMS patients than in the general population was observed for generalized anxiety disorder, panic attack, phobias,<sup>89</sup> obsessive compulsive disorder,<sup>90</sup> post-traumatic stress disorder,<sup>90,91</sup> major depressive disorder,<sup>92</sup> dysthymia,<sup>93</sup> and bipolar disorders.<sup>94,95</sup>

The intensity of negative affective states is positively associated with increased pain intensity, irritability, physical

and mental strain, functional limitations, the number of tender points, non-restorative sleep, cognitive deficits, fatigue, and the impact of the illness on quality of life.<sup>90,96,97</sup> FMS patients usually feel isolated, misunderstood, or rejected by relatives, friends, health workers, and society in general. This may contribute to the high prevalence of depression, along with the constant and intense pain.<sup>90</sup> There is also evidence of high levels of anxiety related to FMS patients' heightened perception of pain and somatization of symptoms.<sup>88</sup>

Chronic pain is a risk factor for suicidal behaviors.<sup>98</sup> In the case of FMS, the estimated prevalence of suicidal attempts has been reported as 16.7%,<sup>99</sup> rising to 58.3% in the case of FMS with comorbid migraine.<sup>100</sup> Thus, FMS patients have a higher rate of suicide attempts than the general population, where their risk of suicide is similar to that observed in other chronic diseases.<sup>101</sup> Suicidal behaviors in FMS include suicidal ideation,<sup>102,103</sup> suicide attempts,<sup>104</sup> and death by suicide.<sup>105,106</sup> The risk of suicide in FMS is increased due to the presence of a constellation of factors that are usually related to suicide, such as being female,<sup>107</sup> psychological distress, poor sleep quality,<sup>108,109</sup> enhanced fatigue,<sup>110</sup> psychiatric comorbidities (especially depression, bipolar disorders, and borderline personality),<sup>101,108,111</sup> and physical comorbidities (like headache and gastric diseases).<sup>101</sup> Suicidal ideation is more common than suicide attempts<sup>112</sup> and the latter occurs ten times more frequently than suicide.<sup>113</sup> Suicidal ideation

in FMS is related to comorbid depression, anxiety, and a high negative impact on daily life activities.<sup>103</sup> The inclusion of FMS patients in suicide risk assessments in clinical practice, to prevent suicide, is an important consideration in clinical practice.

## Personality, temperament, character, and fibromyalgia

Personality characteristics modulate an individual's response to psychological stressors<sup>27</sup> and adjustment to chronic illness.<sup>27</sup> An "FMS personality" is a topic that remains under debate. While some authors have found characteristic FMS traits,<sup>27</sup> others have failed to find any particular personality features.<sup>114</sup>

Some personality disorders appear to be more prevalent in FMS patients than in the general population, including obsessive-compulsive personality disorder,<sup>115,116</sup> borderline personality,<sup>94</sup> avoidant personality disorder,<sup>117,118</sup> and histrionic personality disorder.<sup>115</sup> Some studies have observed a predominance of certain personality traits in FMS, such as perfectionism,<sup>119,120</sup> alexithymia,<sup>84,121</sup> neuroticism,<sup>27,122,123</sup> psychocitism,<sup>123</sup> avoidant personality traits,<sup>115,117,118</sup> and type D personality<sup>124</sup> (which combine high negative affect with social inhibition).<sup>125</sup>

Some studies have focused on the Big Five Model of Personality, which includes five dimensions: extraversion vs introversion, agreeableness vs antagonism, conscientiousness vs impulsivity, neuroticism vs emotional stability, and openness vs closed-mindedness.<sup>126</sup> In FMS, high neuroticism and low conscientiousness (high impulsivity) have been found, which seem to be related to high levels of chronic pain.<sup>126</sup> Furthermore, in some FMS patients, the high level of neuroticism is usually accompanied by low extraversion, contributing to more severe psychosocial problems.<sup>127</sup> Extraversion in FMS is associated with lower levels of pain, anxiety, and depression, and better mental health, thereby constituting a protective influence against FMS.<sup>45</sup> In general, the presence of personality disorders and negative personality traits in FMS is associated with poorer results after pain treatment,<sup>128,129</sup> a worsening of the functional status, higher health care demands (particularly in terms of increased number of medical visits), and greater occupational and medical costs.<sup>118,130</sup>

Some studies have focused on the temperament and character of FMS patients, mainly based on Cloninger's Personality Model, using the Temperament and Character Inventory.<sup>131</sup> High harm avoidance, high self-transcendence, low cooperativeness, and self-directedness have been found in FMS patients.<sup>132-134</sup> Harm avoidance is related to pes-

simism, concerns about the future, fear of the unknown, and shyness. Self-transcendence can be conceptualized as spiritual ideas that involve a state of unified consciousness in which everything is an integral part of a totality, favoring a spiritual union with the universe. Self-transcendence has been associated with post-traumatic stress and psychotic symptoms, such as borderline, narcissistic, schizotypal, and paranoid symptoms.<sup>135</sup> Low levels of cooperativeness include social intolerance, lack of social interest, and a tendency to further their own interests. People with low self-directedness usually have difficulties in accepting responsibility and being independent, and show a lack of long-term goals, low motivation, and low self-esteem.<sup>131</sup>

## Impact of FMS on self-concept

The few studies available in this field have found lower self-esteem<sup>66,136,137</sup> levels in FMS patients. Lower self-esteem is related to a reduction of cognitive performance in FMS, especially in terms of attention, memory, and planning abilities.<sup>66</sup> FMS patients tend to experience a higher need to earn self-esteem through competence and others' approval. It is known that self-esteem is related to self-confidence and self-efficacy expectations.<sup>136,137</sup> Self-efficacy (the confidence one has in one's ability to perform or resolve a specific behavior or problem)<sup>138</sup> or perceived self-efficacy (individuals' beliefs in their capacities to achieve certain goals)<sup>139</sup> is usually low in FMS patients.<sup>140,141</sup> Pain-related self-efficacy, conceptualized as beliefs about the ability to perform activities despite pain,<sup>142</sup> is also damaged in FMS.<sup>140,143</sup> A high positive association has been found between self-efficacy and treatment adherence and improvements in FMS, with better self-efficacy being associated with more positive outcomes.<sup>140,141</sup> Thus, interventions aimed at increasing self-esteem may be useful to improve expectations of self-efficacy and the patient's own ability to manage their illness, thus promoting better adaptation to the disease.<sup>144</sup>

Several studies have shown a precarious or negative self-image in FMS patients.<sup>116,145</sup> Self-image problems are associated with the notion of an ill person, which radically alters FMS patients' self-identity. Moreover, FMS patients' self-image seems to be modified during the development and course of the illness<sup>146</sup> and therapeutic interventions,<sup>147</sup> affecting their self-identity.<sup>148</sup> In spite of the relevance of the self-image concept, few studies to date have addressed this issue.

Body image is part of the overall self-image and is defined as the subjective perceptions, feelings, and thoughts about the physical body. It includes perceptual and affective compo-

nents,<sup>149</sup> which are usually affected in pain-related illnesses.<sup>150</sup> Indeed, there is evidence of a negative body image in FMS patients,<sup>151,152</sup> further exacerbated by the high prevalence of overweight and obesity.<sup>153,154</sup> FMS body image also seems to be influenced by the illness-affected body parts (especially painful and stiff areas), problems in cognitive function, negative health care experiences, activity limitations, and decreased quality of life.<sup>151</sup>

## Patient beliefs about fibromyalgia

The unknown etiology of FMS and the lack of objective diagnostic markers of the disease have led to a debate about its legitimacy and controversies regarding its true nature.<sup>114</sup> The negative experience of FMS patients is exacerbated due to the occasional perception that it is not a genuine disease.<sup>155</sup> Additionally, FMS patients cite the lack of physical markers of the illness as a reason for the delay in diagnosis and the source of doubts about the authenticity of the illness.<sup>151</sup> Many FMS patients report that their family and friends do not understand their disease;<sup>156–158</sup> this lack of support could affect their functioning and recovery. Some studies have confirmed the relevance of support from family, friends, and health care staff for managing daily life with chronic illnesses, including FMS.<sup>159,160</sup>

In this way, FMS patients feel a double burden because their life is dominated by pain but it is not adequately acknowledged.<sup>161</sup> In fact, the process of FMS diagnosis is stressful for patients due to the lack of objective clinical markers and physician doubts, together with the general uncertainty of the process.<sup>162</sup> The majority of FMS patients feel relieved when they finally receive their FMS diagnosis. However, this relief tends to evaporate when they realize the ineffectiveness of treatments and the illness prognosis.<sup>163,164</sup>

Patients with FMS experience a sense of invisibility because of debates regarding the authenticity of the diagnosis, treatment, and health care in general.<sup>155,165</sup> Moreover, FMS patients usually feel embarrassed because they are no longer able to perform daily tasks as before.<sup>156</sup> In fact, they have problems in planning daily life activities and interactions with family and their social circles due to the severity of their symptoms, such that they become more isolated.<sup>157,161,166</sup> Dissatisfaction with the patient–doctor relationship is another recurring problem, together with frustration due to uncertainty regarding the etiology and treatment of FMS.<sup>164</sup>

FMS seems to undermine patients' self-confidence and sense of self<sup>155</sup> and disrupts their identity.<sup>167</sup> In this sense, FMS patients experience a transition or change in identity due to the illness, which is apparently invisible to the people

who saw them when healthy due on the basis of their external or physical appearance.<sup>168</sup>

Clearly, FMS patients can be perceived negatively, which worsens their symptoms and functioning. In their own words, they experience “illness intrusiveness” characterized as disruptions of valued activities, lifestyle, and interests, leading to compromised global quality of life. Evidence also suggests that feelings of vulnerability and apprehension about having a chronic illness of unknown origin may contribute to limiting patients' activities, inability to sustain work, and somatic distress.<sup>169,170</sup>

## Conclusion

FMS is associated with a high prevalence of emotional and affective disorders (particularly depression, anxiety, borderline personality, obsessive-compulsive personality, and post-traumatic stress disorder), and main symptoms and comorbidities may mutually reinforce each other. FMS reduces functioning in the physical, psychological, and social spheres, and has a negative impact on personal relationships (including sexuality and parenting), work, daily activities, and mental health. FMS patients also show problems in cognitive performance, especially in planning, attention, memory, executive functions, and processing speed. There is also evidence of high levels of negative affect, neuroticism, perfectionism, stress, anger, and alexithymia in FMS patients. High harm avoidance together with high self-transcendence, low cooperativeness, and low self-directedness have been found as temperament and character features of FMS patients. Furthermore, FMS patients tend to have a negative self-image and body image perception, as well as low self-esteem and perceived self-efficacy. In some cases, FMS patients show suicidal ideation, suicide attempts, and consummated suicide. FMS patients perceived the illness as a stigmatized and invisible disorder that is difficult to understand. The negative illness perception and lack of social support worsen their symptoms and functioning.

Due to the scarce etiological knowledge about FMS, there is currently no agreement about its appropriate therapy, and treatment effects have been claimed to be unsatisfactory.<sup>171</sup> However, various interventions, especially combinations of pharmacological with other types of treatments, may be helpful in reducing FMS symptoms and their impact on quality of life. Some evidence is available for positive effects of moderate aerobic exercise, cognitive-behavioral therapy, self-management programs, mindfulness training, and acceptance and commitment therapy.<sup>3,172</sup> Furthermore, educative programs may help in increasing self-confidence,

self-esteem, and pain self-efficacy.<sup>173</sup> Finally, FMS patients should stay active at the physical and social levels, and avoid sedentary lifestyles in order to control BMI and improve functioning and health-related quality of life.<sup>174</sup> However, further research is clearly warranted in order to establish a platform from which to develop guidelines regarding psychological interventions in FMS.

## Disclosure

The authors report no conflicts of interest in this work.

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