Review

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Psychological Factors Associated with Fibromyalgia and the Areas of Psychological Intervention

Fibromiyalji ile İlişkili Psikolojik Faktörler ve Psikolojik Müdahale Alanları

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ABSTRACT

Fibromyalgia is a musculoskeletal pain syndrome characterized with the presence of sensitive points and widespread chronic pain and restricts one's daily life activities and decreases the quality of life. The etiology of fibromyalgia is unclear, but there are numerous hypotheses regarding the emergence and progression of the disease. Among these, the biopsychosocial model offers a holistic framework in which biological, psychological and social mechanisms play a role in the development of fibromyalgia. Since the etiology of the disease is not yet understood, effective methods for its treatment have not been found, thus, interventions aim to reduce the effect of fibromyalgia and increase psychological and physiological functionality. This article aims to examine the psychological intervention areas and methods for fibromyalgia patients. In the literature, it is concluded that pain avoidance beliefs and behaviors, self-efficacy, physical activity, sleep quality, self-compassion, emotional skills, coping strategies, personality, comorbid psychopathology are the factors related with the emergence of the disease, severity of pain, and adherence to treatment in fibromyalgia patients. In this context, Cognitive-Behavioral Therapy (CBT), physical exercises, sleep management Acceptance and Commitment Therapy (ACT), compassion focused psychotherapies, mindfulness based psychotherapies, emotion expression and emotion regulation techniques, and biofeedback are recommended as effective methods which can be included in the treatment plans of fibromyalgia patients. Moreover, considering the psychosocial factors in the assessment processes was essential to establish individualized treatment plans. In addition, the importance of multidisciplinary approaches in the treatment processes of fibromyalgia has been discussed within the framework of the biopsychosocial model.

Keywords: Chronic pain, fibromyalgia, multidisciplinary treatments, psychological intervention

ÖZ

Fibromiyalji, yaygın vücut ağrısı ile ağrının lokalize olduğu duyarlı noktaların varlığı ile tanımlanan, kişinin günlük yaşam aktivitelerini kısıtlayan ve yaşam kalitesini düşüren bir kas iskelet sistemi ağrı sendromudur. Fibromiyaljinin etiyolojisi belirsizdir, ancak hastalığın ortaya çıkması ve ilerleyişi hakkında çok sayıda hipotez vardır. Bunlar arasından biyopsikososyal model, fibromiyaljinin gelişiminde biyolojik, psikolojik ve sosyal mekanizmaların bir arada rol oynadığı bütüncül bir çerçeve sunmaktadır. Hastalığın etiyolojisi henüz anlaşılamadığından, tedavisine yönelik etkili yöntemler bulunamamıştır, bu nedenle müdahale yöntemleri fibromiyaljinin olumsuz etkilerini azaltmayı, psikolojik ve fizyolojik fonksiyonelliği artırmayı hedeflemektedir. Bu makalede fibromiyalji hastalarında psikolojik müdahale alanları ve yöntemlerinin incelenmesi amaçlanmaktadır. Literatür incelendiğinde, ağrı ile ilişkili inançlar ve kaçınma davranışları, öz-yeterlilik, fiziksel aktivite, uyku kalitesi, öz-şefkat, duygusal beceriler, baş etme stratejileri, kişilik, eşlik eden psikopatolojiler gibi faktörlerin hastalığın gelişimini, ağrı şiddetini ve hastaların tedaviye uyumunu etkilediği sonucuna ulaşılmıştır. Bu bağlamda, Bilişsel-Davranışçı Terapi (BDT), fiziksel aktivite ve uyku hijyeni takibi, Kabul ve Kararlılık Terapisi (KKT), şefkat odaklı terapiler, farkındalık temelli terapiler, duygu ifadesi ve düzenlenmesine yönelik teknikler, biyogeribildirim gibi yöntemlerin tedavi planlarında yer alabilecek etkili yöntemler olduğu, ancak hastalığı değerlendirme sürecinde psikososyal etmenler göz önünde bulundurularak bireyselleştirilmiş tedavi planları oluşturulmasının elzem olduğu sonucuna ulaşılmıştır. Buna ek olarak, biyopsikososyal model çerçevesinde fibromiyaljinin tedavi süreçlerinde çok disiplinli çalışmanın önemi tartışılmıştır.

Anahtar sözcükler: Kronik ağrı, fibromiyalji, çok disiplinli tedavi, psikolojik müdahale

Introduction

Fibromyalgia is a musculoskeletal pain syndrome that continues for at least 3 months and is defined by the presence of widespread body pain and localized tender points, which does not have a medical cause. Fibromyalgia limits the daily activities of the person and reduces the quality of life (Friedberg and Jason 2001, Friedberg 2010, Lorente et al. 2014). Fibromyalgia considerably reduces the quality of life, and the most common complaints of patients are sleep disturbance, weakness, fatigue, depression and cognitive problems (Sephton et al. 2003, Topbaş et al. 2005, Bennett et al. 2007, Acar-Sivas et al. 2008). Epidemiological

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studies conducted around the world show that this syndrome is more common in women (Branco et al. 2010, Queiroz 2013). The prevalence of fibromyalgia is 3.4% among women and 0.5% among men (Demirbağ and Bulut 2018). Its prevalence among women aged 20-64 is 3.6% and the most common age range is 50-59 in Turkey (Topbaş et al. 2005).

The etiology of fibromyalgia is unclear in the main (Friedberg 2010, Hauser et al. 2016, Heidari et al. 2017). Various hypotheses have been proposed about the pathogenesis of the disease. There are studies showing the relationship between immune system disorders, sleep disorders, neuroendocrine disorders, peripheral and central nervous system abnormalities and fibromyalgia symptoms; however, the findings of these studies are not sufficient to determine the mechanism of the disease (Gür 2008, Ramanthan et al. 2012). This situation suggested that psychosocial factors may also be involved in the pathogenesis of the disease and increased the interest in multidimensional approaches.

The biopsychosocial model presents the biological, psychological and social mechanisms that play a role in the etiology of fibromyalgia in an integrative framework. According to this model, genes, early traumatic experiences, lifestyle, sleep disorders, and depression are predisposing factors to fibromyalgia. Psychological stress, physiological stress, somatization and traumatic life events are triggering factors. The factors that perpetuate or worsen the disease are comorbid mental disorders such as depression and post-traumatic stress disorder (Gatcel et al. 2007, Hauser et al. 2015).

In a survey conducted by Bennett et al. (2007) with 2596 fibromyalgia patients, 73% of the patients reported that their symptoms started as a result of a triggering traumatic event. These events can be physical traumas such as acute illnesses, traffic accidents, surgery, as well as psychological traumas such as physical, emotional or sexual abuse. Similarly, Gil et al. (2008) revealed that post-traumatic stress disorder is more common in fibromyalgia patients than in healthy groups. There are findings that such experiences negatively affect functionality in fibromyalgia patients (Hauser et al. 2015, Flippon et al. 2013, Bayram and Erol 2014, Karaş et al. 2017). Walker et al. (1997) revealed that the rate of being a victim of abuse is high in fibromyalgia patients, but that physical violence, especially in adulthood, is a stronger predictor of unexplained pain and increases the risk of fibromyalgia. Consequently, it is seen that traumatic experiences are important in the emergence and maintenance of fibromyalgia.

The comorbid psychopathologies are more common in fibromyalgia compared to other chronic pain syndromes, and almost all patients get at least one psychiatric diagnosis throughout their lives (Walker et al. 1997). The most common psychopathologies accompanying fibromyalgia are anxiety disorders and mood disorders. In a study conducted in a Turkish sample, it was reported that 16.7% of patients diagnosed with fibromyalgia had anxiety disorders and 8.1% had mood disorders (Bilge et al. 2018). According to their study results, Bayram and Erol (2014) reported that 63.3% of the participants with fibromyalgia have anxiety scores above the threshold; 53.3% of them have depression scores above the threshold. In addition, Güven et al. (2005) reported that depressive symptoms in fibromyalgia patients began much earlier than pain-related symptoms. In general, it is clearly seen that comorbid psychopathologies negatively affect functionality in fibromyalgia patients (Walker et al. 1997).

When the personality profiles and temperament characteristics of fibromyalgia patients are examined, it is noteworthy that the levels of trait anxiety, hypochondriasis, hysteria, sociotropy, anger-in and alexithymia are higher than those of healthy individuals (Çeliker et al. 1997, Sayar et al. 2004, Gencay-Can and Can 2012). In addition, neuroticism, agreeableness, and conscientiousness were found to be associated with high levels of pain anxiety and pain catastrophizing (Martinez et al. 2011). Fibromyalgia patients have a higher level of harm avoidance than healthy individuals, and a high level of harm avoidance is associated with carefulness, fearfulness, nervousness, and personality traits such as skepticism, insecurity, and pessimism even in situations that do not harm other people (Altunören et al. 2011, Gencay- Can and Can 2012).

Pain is a complex and dynamic phenomenon consisting of genetic, physiological, cognitive, affective, behavioral and social components (Hasset and Gevirtz 2009). In this context, although personality traits, cognitive predispositions, physiological predispositions, and disorders accompanying fibromyalgia are broad spectrum, they differ from person to person and greatly affect the severity of the disease. Therefore, multidimensional and interdisciplinary approaches are needed in theory and practice in order to understand fibromyalgia and to create effective treatment plans (Roy 2008). In this article, it is aimed to review the psychological factors related to the effects of fibromyalgia on the individual and the areas where psychologists can intervene in integrative treatment models and to summarize the findings regarding the intervention techniques.

Psychological Factors Associated with Disease Severity and Functionality in Fibromyalgia

Sleep Disorders

Sleep disorders are one of the most common problems in fibromyalgia patients. In their study, Demirbağ and Bulut (2018) reported that 74.3% of fibromyalgia patients did not have a sleep pattern.. Most of the patients complain of not having a deep and restful sleep, inability to relax, involuntary leg movements and frequent awakenings (Acar Sivas et al. 2009, Choy 2015, Diaz Piedra et al. 2015). Moreover, fibromyalgia patients have a higher daytime sleepiness and a shorter total sleep time (Acar Sivas et al. 2009).

Anch et al. (1991) revealed that abnormalities in alpha and delta wave patterns are seen in deep sleep in fibromyalgia patients. It is suggested that this situation is associated with increased pain intensity and fatigue, as a result of restless sleep (Gür 2008). Restless sleep was associated with increased pain-

related catastrophizing thoughts in the morning, and increased catastrophizing was associated with pain severity. Since the increase in pain intensity is related to the interruption or postponement of physical activities throughout the day, sleep quality in fibromyalgia patients may affect the whole daily life (Mun et al. 2020). In this context, in the continuation of a restless and not deep sleep, patients may experience increased pain intensity during the day, as well as decreased physical activity level and negative mood (Choy 2015). In another study conducted with fibromyalgia patients (Fang et al. 2019), it was found that subjective sleep quality played a mediating role in the relationship between pain severity and cognitive performance. Accordingly, pain intensity negatively affects sleep quality, which negatively affects sustained attention performance.

Although the relationship between physical activity, pain level and sleep has been demonstrated many times, the direction of these relationships is still unclear. McGovney et al (2021), in a study they conducted using objective measurement tools, revealed that increased physical activity level in the afternoon and afternoon is associated with decreased sleep quality, and this relationship is stronger in patients with high pain levels. However, in another study, it was observed that a decrease in the time spent sedentary and an increase in the level of physical activity were associated with higher sleep quality in fibromyalgia patients (Borges-Cosic et al. 2019). Sleep disturbance lowers the pain threshold in healthy individuals, similar to fibromyalgia, and as a result, it can lead to symptoms such as fatigue, muscle pain and sensitivity. However, the assumptions that sleep disorder may also develop as a result of anxiety, depression or pain and the fact that it can be seen in a very wide spectrum prevent a cause-effect relationship to be established between fibromyalgia and sleep disorder (Acar Sivas et al. 2009, Choy 2015). Despite this, it is obvious that sleep quality affects the severity of fibromyalgia symptoms and negative affect, therefore it should be an important part of fibromyalgia treatment plans (Affleck et al. 1996, Gür 2008, Hamilton et al. 2008, Miro et al. 2011, Balbaloğlu 2018).

Physical Activity Level and Associated Avoidance Behaviors

Regular exercise and optimal physical activity are necessary to prevent/decrease depression and improve quality of life, along with physical benefits such as reducing the severity of fibromyalgia symptoms, increasing functionality and vitality, therefore, it is of great importance in fibromyalgia treatment processes (Culos-Reed and Brawley 2003, Busch et al. et al. 2009, Steiner et al. 2017). However, regular exercise can be challenging for some fibromyalgia patients. As in all chronic pain syndromes, sudden increase in activity or excessively active exercises increase the severity of symptoms in fibromyalgia. As a result, approximately 40% of patients are afraid and avoid moving frequently because they think that it will increase the severity of symptoms or fear of re-injury (Burwinkle et al. 2005, Nijs et al. 2013). Since avoiding activities that require movement prevents pain in the short term, avoidance behaviors are reinforced and this situation contributes to chronicity (Asmundson et al. 1999). This condition, which is quite common in fibromyalgia patients, is called fear of movement, avoidance of movement or kinesophobia in the literature, and the associated factors are being investigated (Turk 2004, Turk et al. 2004).

Turk et al. (2004) revealed that disability, depressive mood and pain severity were higher in fibromyalgia patients with a high level of fear of pain and fear of movement, and their movement performance was lower than in patients with a low level of fear. In addition, fibromyalgia affects patients' self-efficacy beliefs about being active and exercising regularly. In this context, avoidance of pain, pain-related experiences and activities seems to be more restrictive than the pain itself (Asmundson et al. 1999). Palstam et al. (2016) revealed that the decrease in beliefs that cause avoidance of physical activity in patients with fibromyalgia who had a high initial pain level and applied a resistance exercise program for 15 weeks, reduced the disability caused by pain.

Asmundson et al. (1999) revealed that there is a significant positive relationship between pain severity and anxiety sensitivity and fear of pain. Accordingly, they suggested that cognitive restructuring, relaxation exercises, and exposure to pain-related stimuli aimed at reducing the level of anxiety sensitivity should be included in psychotherapy processes. Olthuis et al. (2015) designed a cognitive behavioral intervention program targeting anxiety sensitivity and tested the effects of this intervention on pain-related anxiety. Psychoeducation, cognitive restructuring, physical exercise and interoceptive exposure and relapse prevention techniques were applied to the participants within the scope of cognitive behavioral therapy for 8 weeks. The results of the study showed that the CBT plan targeting anxiety sensitivity can be an effective intervention on the level of pain-related anxiety. In addition, Volders et al. (2015) stated that pain can be a danger signal when it develops suddenly, but this is not the case in chronic pain patients. In this context, they suggested that reinterpreting chronic pain patients' catastrophic cognitions about pain by exposure method could lead to a reduction in fear of pain.

One of the factors associated with physical activity level is self-efficacy. According to Culos-Reed and Brawley (2003) self-efficacy predicts physical activity intention and behavior and plays a mediating role in the relationship between fear of pain and pain-related avoidance behaviors (Asmundson et al. 1999). All these findings suggest that clinicians working with fibromyalgia patients should carefully consider pain-related fear and anxiety when creating individualized treatment plans.

Cognitive and Emotional Factors Associated with Fibromyalgia

Melzack and Casey (1968) state that pain is a multidimensional experience consisting of sensory-discriminative, affective-motivational and cognitive-evaluative components. Attribution to the source of pain is one of the factors that can vary from person to person and affect the cognitive mechanisms associated with

pain. According to Turk (2004), believing that pain is caused by physical activity contributes to fear of movement, development of avoidance behaviors, and increased selective attention to somatic symptoms. However, when patients attribute the onset of fibromyalgia symptoms to a physical trauma, clinicians may include more pharmacological interventions and physiotherapy applications to reduce physiological symptoms in their treatment plan (Turk 2004).

Another factor known to be associated with fibromyalgia symptoms is catastrophizing, which is defined as a series of negative cognitions and emotional processes and consists of components such as exaggerating the negative consequences of pain and rumination (Pulido-Martos et al. 2020). Studies with different chronic pain samples and age groups show that catastrophizing is positively associated with the level of pain self-report, overt pain behavior, pain-related disability, and painkiller use (Keefe et al. 2001). In addition, women with fragile self-concept and high levels of anxiety have a higher level of pain-related catastrophizing (Kratz et al. 2012).

In addition to these, hypervigilance towards physical symptoms is common in fibromyalgia patients (Raak et al. 2003). This situation may cause bodily signals to be interpreted as painful stimuli by overemphasizing them (Turk 2004). Moreover, catastrophizing was found to be significantly associated with pain-related symptoms and excessive attention to bodily sensations (Hedman-Lagerlöf et al. 2019). All these draw attention to the importance of psychological interventions that can be made especially within the scope of cognitive-behavioral therapies in fibromyalgia treatment plans.

Self-Efficacy

Self-efficacy is one of the most important predictors of functionality and psychological adjustment (Sahar et al. 2016). In this context, studies conducted with chronic pain patients showed that self-efficacy was higher in physical functionality and activity level, better physical health, higher job performance; showed that it was associated with lower pain intensity, fatigue, physical disability, depressive symptoms, and disease activity (Martinez-Calderon et al. 2018). However, in a study conducted with fibromyalgia patients, it was concluded that although the effect of fibromyalgia is high, self-efficacy predicts the level of initiation and maintenance of physical exercises (Scioli-Salter et al. 2020). Similarly, Culos-Reed and Brawley (2003) stated that self-efficacy directly and positively predicted physical activity level. In another study, it was revealed that self-efficacy affects an individual's beliefs about their capacity to manage pain; It has been observed that chronic pain patients with high self-efficacy beliefs exhibit more coping behaviors (Jensen et al. 1991).

When we look at the literature, it is seen that high self-efficacy is positively associated with functionality and adherence to treatment in fibromyalgia patients (Huyser et al. 1997). However, there are also studies showing that self-efficacy plays a mediating role in the relationship between distress and pain (Miro et al. 2011). In the light of these findings, it is thought that psychological interventions to increase self-efficacy may be beneficial to increase functionality.

Self-Compassion

Self-compassion is defined as the individual's being sensitive to the distress/pain they are experiencing and being willing to eliminate these distresses. It is known that self-compassion is a personality trait, as well as a structure that can be developed with various tecniques (Perez-Aranda et al. 2017). It has been found that chronic pain patients with high self-compassion levels have lower pain severity and higher activity engagement (Carvalho et al. 2018). In addition, self-compassion is associated with health-enhancing behaviors in fibromyalgia patients, as in many patient populations, and adherence to treatment (Sirois and Hirsch 2019). Similarly, pain acceptance makes it easier to engage in useful activities despite the pain and contributes to increasing self-management and functionality (McCracken et al. 2005, Trainor et al. 2019). In this context, it is thought that group therapies or individual therapies aimed at improving self-compassion such as Mindful Self-Compassion, Compassion-Focused Therapy, Compassion Cultivation Training may be beneficial in multidimensional fibromyalgia treatments (Kirby 2016, Perez Aranda et al. 2017).

Coping Strategies

Coping strategies are one of the most important predictors of pain severity and disability (Martin et al. 1996, Sahar et al. 2016). Fibromyalgia patients use more adaptive and maladaptive coping strategies than other chronic pain patients and healthy individuals, and these strategies can be very diverse (Burckhardt et al. 1997, Baastrup et al. 2016). It is known that fibromyalgia patients who use maladaptive coping strategies more frequently experience higher levels of pain, depression and anxiety, while these symptoms are seen at lower levels in patients who use adaptive coping strategies (Terol-Cantero et al. 2020). However, Martin et al. (1996) argue that the use of cognitive and behavioral coping strategies in fibromyalgia patients is reinforced as a result of reducing psychological disability, but increasing the level of physical disability. It has been revealed that fibromyalgia patients use avoidant coping methods such as suppression and substitution more than healthy individuals (Ablin et al. 2008). However, it has been observed that emotional avoidance strategies are associated with higher mental distress, pain and fatigue in fibromyalgia patients, do not affect functionality positively (Van Middendorp et al. 2008), and active avoidance behaviors cause low physical activity levels in fibromyalgia patients (Karsdorp and Vlaeyen 2009). On the other hand, it has been demonstrated that problem-focused or emotion-focused coping strategies can be effective in reducing the effect of fibromyalgia and increasing psychological resilience (Di Tella et al. 2018, Braun et al. 2020). For example, in a study conducted with chronic pain patients, emotion-focused coping methods were associated with lower negative affect in young-middle-aged individuals; It has also been reported that it is indirectly associated with reduced pain intensity (Ziadni et al. 2020). In another study conducted with fibromyalgia patients, problem-focused coping methods such as seeking social support,

increasing the amount of daily activity, and active coping methods such as positive reinterpretation were found to be positively associated with higher quality of life. In addition, reinterpretation was found to be the most effective coping method for pain control and pain reduction. (Braun et al. 2020). Based on these findings, it is recommended to evaluate the individual's coping behaviors while scheduling individualized fibromyalgia treatment plans and to plan psychological interventions when necessary. Cognitive-behavioral interventions such as pain coping training are known to be effective in supporting adaptive coping behaviors and are recommended to clinicians working with fibromyalgia patients (Braun et al. 2020, Wang et al. 2021). Moreover, it is thought that it may be beneficial to plan psychoeducation programmes, which aims to identify coping behaviors that increase or maintain the severity of the disease and to raise awareness on this issue, and, instead of these behaviors, to teach behaviors that will facilitate adaptation to the disease and increase quality of life, such as cognitive restructuring, positive re-evaluation, seeking social support, problem-focused active coping strategies (Gomez de Regil 2021).

Emotional Factors

Decreased ability to describe, understand and express emotions is called alexithymia in the literature and is a very common condition among fibromyalgia patients (Sayar et al. 2004, Steinweg et al. 2011). Alexithymia significantly affects the psychological and physiological symptoms of fibromyalgia (Middendorp et al. 2008). Keefe et al. (2001) explained that patients with high alexithymia have difficulty in distinguishing between emotional and perceptual stimuli, their ability to use cognitive strategies to reduce pain is limited, and that psychological arousal may cause physiological pain. On the other hand, although there are opinions that alexithymia affects the severity of pain, there are hypotheses that pain may affect the level of alexithymia by reducing the ability to identify and distinguish emotions as a stressor (Lumley et al. 2011). In addition, it is thought that traumatic experiences, which are quite common in fibromyalgia patients, may also cause alexithymia (Gil et al. 2008).

It has been revealed that alexithymia predicts dysfunctional coping behaviors in fibromyalgia patients and is negatively associated with emotion-focused and problem-focused coping styles (Di Tella et al. 2018). While it is known that the level of alexithymia of the individual is related to the severity of pain and disability, it is observed that especially suppressed negative emotions increase the severity of pain (Friedberg and Jason 2001). In short, alexithymia predicts the severity of pain in patients with fibromyalgia, complicates adaptation to the disease and negatively affects pain management (Sayar et al. 2004).

The level of anger-in and anger rumination in fibromyalgia patients is higher than in healthy individuals and other chronic pain samples (Middendorp et al. 2008, Toussaint et al. 2019). Studies show that there is a positive relationship between unexpressed anger and pain severity in chronic pain patients, and it was found that anger awareness was lower in this group compared to other diagnostic groups, and anger suppression levels were higher than in healthy individuals (Lumley et al. 2011). However, it has been reported that the level of anger expression is associated with less degree of pain in fibromyalgia patients (Lumley et al. 2011).

In addition to these, there are also findings that increase in positive affect and decrease in negative affect predict a decrease in pain severity (Lumley et al. 2011, Sancassiani et al. 2019). In an experimental study that tested the causal relationship between mood and pain tolerance, it was concluded that negative mood significantly decreased pain tolerance and increased the level of reported pain (Salovey and Birnbaum 1989). There are also findings that an increase in pain level predicts negative affect. (Zautra et al. 2005).

Psychological Intervention Methods in Fibromyalgia Syndrome

Because the etiology of fibromyalgia is unclear and the symptoms are diverse and unpredictable, the treatment process is challenging for clinicians and patients (Johnson et al. 2006). However, fibromyalgia affects the daily lives of patients in many ways, but as it is known, each patient's level of impact in certain areas is different from each other. For this reason, patients' priorities and expectations from treatment may also differ. Studies show that fibromyalgia cannot be completely cured, so in treatment plans, priority is given to the areas that patients have the most trouble with, and targets such as reducing the severity of symptoms and increasing adherence to treatment and functionality are determined. In this context, the data obtained with clinical or psychological evaluation is of great importance. An effective and individual-oriented evaluation process is essential for determining realistic treatment goals and effective intervention methods (Arnold et al. 2016).

Assessment and Evaluation in Fibromyalgia

According to Turk (2002), pain is not a monolithic entity; It is a whole formed by perception, thoughts, feelings and behaviors. From this point of view, the psychological and physiological effects of fibromyalgia syndrome vary depending on a wide variety of factors. For this reason, in order to decide on the most accurate psychological interventions to be applied to fibromyalgia patients, it is necessary to comprehensively evaluate the physiological and psychosocial characteristics of the individual.

The Fibromyalgia Impact Questionnaire (FIQ) is the most used tool to measure the physiological and psychological impacts of the disease and to evaluate functionality in fibromyalgia patients (Bennett et al. 2009). The validity and reliability studies of the Turkish version of the scale were performed by Sarmer et al. (2000). On the other hand, due to the wide variety of variables affecting disease severity and accompanying psychological disorders, more than this scale is required for an effective and accurate assessment. The initial levels of many factors such as depression and anxiety levels, personality traits, alexithymia, emotion regulation strategies, coping strategies, pain-related

beliefs, pain-related avoidance behaviors, sleep-related factors, factors causing sleep disturbance (difficulty in falling asleep, sleep apnea, frequent waking, etc.), physical activity level and the changes of them in the process should be carefully followed by using appropriate evaluation tools and appropriate intervention methods should be selected accordingly (Turk and Rudy 1986, Balbaloğlu, 2018).

Psychoeducation

One of the most important components of non-pharmacological fibromyalgia treatments is patient education (Gomez-de-Regil 2021). When a patient is diagnosed, general information about the disease is usually given, but in the case of chronic diseases that require long-term treatment, it is important to have knowledge of the complex relationships between neurobiological processes, behaviors and symptoms (Hassett and Gevirtz 2009).

Psychoeducation integrates emotional and motivational aspects in order to enable patients to cope with the disease, to increase treatment adherence and treatment effectiveness; it is an intervention method defined as systematic, structured and instructive information transfer for the disease and its treatment (Ekhitari et al. 2017). Psychoeducation for chronic patients is structured towards four basic goals such as the treatment of the disease, the management of the disease process, the importance of compliance with medical and psychological treatment, and the prevention of the progression of the disease (Gomez-de-Regil 2021).

Since fibromyalgia is a chronic musculoskeletal pain syndrome, pain neuroscience education plays a key role in the multidisciplinary treatment of fibromyalgia and has been reported to be significantly more effective than biomedical education (Serrat et al. 2020). Concepts such as central nervous system, pain, fatigue, neuroplasticity, differentiation of acute and chronic pain, etiology of fibromyalgia, regulation and modification of bodily signs, relationship of pain with stress and emotions, perception of pain, fear of pain, anxiety sensitivity, cognitions for pain and pain-related behaviors are the main topics covered in pain neuroscience education (Serrat et al. 2020). In addition to pain neuroscience training in fibromyalgia patients, trainings on concepts such as self-efficacy, positive/negative affect, emotion regulation, catastrophizing and their relationship with pain and fatigue can also be provided (Serrat et al. 2020). Psychoeducational interventions were found to be significantly effective in improving functionality, managing pain perception, anxiety and depression symptoms, and emotions in fibromyalgia patients (Conversano et al. 2019). For fibromyalgia treatments structured with a multidisciplinary approach, psychoeducation is recommended at the beginning of the treatment process (Macfarlane et al. 2017). Psychoeducation sessions can be face-to-face or online; It can be done individually or with a group, and the training should be given by a health worker who has competence in the relevant subject (Conversano et al. 2019, Gomez-de-Regil 2021).

Cognitive-Behavioral Therapy

Cognitive-Behavioral Therapy (CBT) is the most important method whose effectiveness has been investigated on fibromyalgia symptoms (Perez-Aranda et al. 2017). In the literature, there are many studies demonstrating the effectiveness of CBT in different age groups in terms of reducing the factors affecting pain and increasing functionality (Tumlin 2001, Van Koulil et al. 2008, Kashikar-Zuck et al. 2013, Sil et al. 2014, Kashikar-Zuck. et al. 2018).

Many cognitive factors such as beliefs, attitudes and expectations about symptoms, self-efficacy and perceived control, anticipatory anxiety, and coping skills affect pain perception and reactions to symptoms (Tumlin 2001, Turk, 2004). Therefore, the main goals of CBT in the fibromyalgia population can be listed as increasing self-efficacy beliefs that they can manage pain, behavioral activation, changing fear-avoidance beliefs, graded exercise, activity speed control, increasing sleep hygiene by targeting factors that reduce sleep quality, increasing the adaptation, self-control and functionality of fibromyalgia patients with techniques such as reducing maladaptive coping behaviors that reinforce pain and reinforcing adaptive behaviors (George et al. 2006, Roy 2008, Perez-Aranda et al. 2017). In addition, psychiatric comorbidities such as mood disorders, anxiety disorders, and somatization disorders accompanying fibromyalgia are also considered in cognitive-behavioral treatment plans (Friedberg and Jason 2001). In addition, interventions to improve interpersonal relationships can be included in CBT programs to support perceived social support in fibromyalgia patients (Albajes and Moix 2021). In addition to these, Penacoba et al. (2021) revealed that helplessness belief in controlling pain has a moderator role in the relationship between pain avoidance and pain maintenance behaviors and suggested that helplessness beliefs should be reduced before regulating the activity patterns of patients in order to reduce pain maintenance behaviors.

When the studies in the literature are examined, it is seen that CBT is the most effective method among psychological interventions for fibromyalgia-related factors. Alda et al. (2011) conducted a study to compare the effect of CBT, recommended pharmacological treatment, and usual fibromyalgia treatment on the level of catastrophizing pain in fibromyalgia patients. In this study, the participants who received cognitive behavioral therapy in groups of 8 were basically focused on two goals. The first of these is the reduction of dysfunctional cognitions for pain by cognitive restructuring method; the second was determined as teaching cognitive and behavioral coping methods. When the results of the study were examined, it was seen that CBT was the most effective intervention in catastrophizing pain, ruminating about pain, desperation in controlling pain, and exaggerating the negative effects of pain. In addition, it was observed that these positive effects continued in the follow-up measurements made after 6 months.

Fear of pain, avoidance of pain-related activities, and pain-related catastrophizing make it difficult to adapt to fibromyalgia, similiarly, insisting on continuing daily activities by ignoring

pain-related signs and pain makes it difficult to adapt to the disease and negatively affects functionality (Van Koulil et al. 2011). Van Koilil et al. (2011) suggested that classical cognitive behavioral interventions applied in fibromyalgia patients would not be suitable for patients with this pattern. Based on this, in a study they conducted, they divided the participants into two groups as those showing pain avoidance and pain maintenance patterns, and they prepared a separate intervention program for these two groups. The intervention was administered in groups of 8 in 16 sessions; It consisted of cognitive-behavioral therapy and exercises. While methods such as increasing the amount of daily activity and exposing them to situations that would trigger their pain-related fears were used in the participants with the pain avoidance pattern, the methods of adjusting their activities appropriately and restructuring the cognitions about maintaining the pain were used in the participants with the pain maintenance pattern. Looking at the results, it was seen that the intervention applied to both groups was effective on functionality.

While CBTs can be done face-to-face, when they are carried out with a similar content and plan, it is seen that online CBTs are also effective on the effect of fibromyalgia (Vazquez-Rivera et al. 2009, Vallejo et al. 2015). In a study conducted on adults with fibromyalgia, an online intervention program was designed to be implemented in the experimental group. This program, which was created with an interdiagnostic approach, included cognitive-behavioral trainings in 5 sessions and phone calls of 5-10 minutes per week. Interventions such as monitoring thoughts, questioning thoughts, controlled breathing exercises, planning pleasurable activities, problem solving, gradual exposure to fear of pain, and daily activity level control were included in the training sessions. When the data obtained were analyzed, it was observed that the participants in the intervention group had a significant decrease in the level of fear of pain, pain severity and depression compared to the control group that did not receive any intervention. It was reported that these effects continued in the follow-up measurements, 4 months later (Friesen et al. 2017). In addition, group therapies seem to be as effective as individual therapies. It has been reported that fibromyalgia patients who received cognitive behavioral group therapy made more development in catastrophizing, pain severity, psychological discomfort, functionality and sleep disturbance problems than fibromyalgia patients who received only pharmacological treatment (Vazquez-Rivera et al. 2009, Castel et al. 2012).

In addition, it is known that stress increases psychological discomfort and decreases functionality in fibromyalgia patients (Hassett and Gevirtz 2009). Progressive muscle relaxation, breathing exercise and imagery relaxation techniques, which are known to be effective in reducing stress, either alone or within CBT plans, should be included in treatment plans (Hassett and Gevirtz 2009).

Psychological Interventions for the Emotion Expression and Emotion Regulation

Inability to express, process or regulate negative emotions appropriately causes pain to be triggered or increased in fibromyalgia patients (Lumley et al 2008). Fibromyalgia patients have significantly more difficulty in naming and describing their emotions; adaptive emotion regulation skills were found to be undeveloped (Sayar et al. 2004, Schmitz et al. 2020). In this context, low level of emotion expression (alexithymia) and emotion regulation skills are thought to be areas that can be intervened in fibromyalgia patients.

It has been shown that fibromyalgia patients with high alexithymia levels benefit from writing down their emotions in the long term (Gillis et al. 2006). Written Emotion Disclosure Paradigm (WED), developed by Pennebaker and Beall (1986), is an intervention method that aims to express unexpressed and repressed negative experiences and associated emotions. This method involves the individual expressing his feelings about a particular experience for a period of 15-30 minutes and is usually repeated 3-5 times at regular intervals. Studies have shown that WED is associated with higher sleep quality, physical well-being, and utilization of health services in fibromyalgia patients. However, these effects appeared to be short-term. However, those who have a high level of education and have difficulties in interpersonal relations; in other words, individuals with limited social support were found to benefit more from WED in the long run (Broderick et al. 2005, Gillis et al. 2006, Junghaenel et al. 2008).

In the case of unresolved traumas, it has been observed that emotional exposure-based treatments and the method of disclosing emotions by writing provide improvement in patients, but the effect of expressing emotion by writing on traumas is short-term (Broderick et al. 2005, Lumley et al. 2008). However, disclosing traumatic experiences also has some disadvantages. The emergence of negative emotions and distressing memories can generally increase the severity of pain and negative affect in patients. Although these negative effects appear to be short-term, this indicates that it is not appropriate for clinicians to practice haphazardly WED. When the studies conducted with chronic pain patients are examined, it is seen that it takes time to see the positive effects of WED; It is seen that the negative effects occur in the short term. In addition, considering the inconsistency of the findings and the limited effects, it is thought that WED alone will not be sufficient in the treatment of fibromyalgia and it is recommended to be used as a complementary method (Broderick et al. 2005, Gillis et al. 2006, Lumley et al. 2012).

Besides the expressing emotions, how negative emotions are regulated in fibromyalgia patients is also important in terms of the impact of the disease. In a study conducted by Rost et al. (2021), it was revealed that the level of mood instability in fibromyalgia patients is higher than in healthy individuals. However, it was observed that mood instability was positively related to the level of disability caused by pain. Based on the results of this study, they suggested that studies aimed at improving emotion regulation skills should be included in the treatment programs of fibromyalgia patients. Although there is no ideal emotion regulation strategy that affects the effect of fibromyalgia, it is thought that defining and regulating pain-related emotions will facilitate adaptation to fibromyalgia (Roy 2008, Geenen et al. 2012). While methods

such as breathing exercises, relaxation exercises, cognitive reassessment, cognitive reframing, distraction, engaging in pleasurable activities, and logical problem solving are aimed at reducing or avoiding negative emotions; imagery, role playing, virtual reality, and techniques for disclosing and experiencing emotions and experiences are classified as methods that facilitate awareness of negative emotions, expressing and processing emotions (Lumley et al. 2012).

Based on the assumption that unresolved, traumatic and distressing emotional experiences exacerbate and perpetuate fibromyalgia symptoms, Lumley et al. (2017) brought together emotion-focused techniques such as expressing emotion, exposure, and rewriting traumatic memories; They created an intervention program called emotional awareness and expression therapy. The intervention program they designed was applied to a group of participants, CBT to one group, and psychoeducation to another group. It was aimed to improve the ability of the participants who received the emotion-focused intervention program to recognize and experience their distressing emotions and to express them harmoniously. As a result of the follow-up measurements made after 6 months, a significant decrease in fibromyalgia symptoms, pain, depression, anxiety and cognitive difficulties, and a significant increase in bodily functionality, positive affect and life satisfaction were observed in the emotion-focused intervention group compared to the psychoeducation group. However, no significant difference was observed compared to the CBT group.

Psychological Interventions for Improving Self-Compassion

When the studies in the literature are examined, it is seen that another area that is frequently intervened in order to indirectly reduce the negative effects of fibromyalgia is self-compassion (Perez-Aranda et al. 2017, Sirois and Hirsch 2019, Montero-Martin et al. 2020).

Mindful Self-compassion (MSC), Compassion-Focused Therapy (CFT), and Compassion Cultivation Training are the prominent therapy models among interventions to improve self-compassion (Kirby 2017). Although there are differences between the theoretical backgrounds, aims and methods of these therapy models, basically psychoeducation, imagery, breathing exercise, empathy, sympathy, mindfulness, mentalization, stress tolerance, acceptance, meditation, self-appreciation, psychodrama, empty chair technique, etc. and to appreciate others, to feel compassion for himself and others, and to gain insight and empathy skills. In addition to these methods, active group discussions, group meditations, and interactive exercises can be used in group compassion-focused interventions (Barnard and Curry 2011, Kirby 2017).

Compassion-focused intervention programs can be created as a group or individually in line with the client's needs, and the techniques used by these therapy models can be included in the client's current psychological intervention program. (Barnard, Curry 2011, Kirby, 2017). In addition, motivational interviews are recommended for compassion-based interventions to be more effective (Steindl, Kirby, Tellegan 2018).

In a study, interventions were made to increase the level of self-compassion within the scope of attachment-based therapy to some of the participants with fibromyalgia; in the other part, relaxation exercises were applied to reduce the level of anxiety and depression. The results of the study showed that the intervention to improve the level of self-compassion was significantly more effective than relaxation exercises in reducing the symptoms of fibromyalgia (Montero-Marin et al. 2020).

Acceptance and Commitment Therapy

Acceptance and Commitment Therapy (ACT) is an intervention method whose effectiveness on fibromyalgia patients has been investigated and is becoming widespread over time (Albajes and Moix 2021). ACT is based on the assumption that the individual's efforts to avoid distressing thoughts, feelings, memories, and bodily perceptions inevitably cause distress to the individual. In this context, it aims to give the individual psychological flexibility rather than focusing on controlling pain or other symptoms. It aims to support the behaviors of the individual in harmony with his values and current situation through basic processes such as acceptance, staying in the moment, cognitive difusion (the individual's distance from his distressing emotions and thoughts), connecting with personal values, and creating a self as context (Hayes et al. 2006).

Experimental studies with chronic pain patients showed that ACT performed individually or with a group reduced the effects of fibromyalgia, physical disability, pain catastrophizing , anxiety and depression, especially in fibromyalgia patients; showed that it increases psychological flexibility (Simister et al. 2018). In a randomized clinical trial, online ACT was administered to the experimental group for 2 months with usual treatment. The control group received only the usual treatment. Significant improvements were reported in the fibromyalgia effect, depression, pain acceptance, pain, and fear of movement in participants who received online ACT along with usual treatment. In addition, it was observed that the increase in the level of acceptance of pain played a mediating role in reducing the fibromyalgia effect of ACT (Simister et al. 2018). Similarly, in a study conducted by Luciano et al. (2014), a significantly higher increase was observed in the functionality of the participants who received group ACT compared to the participants who received pharmacological treatment. However, significant positive changes were observed in accepting pain, catastrophizing pain, subjective pain level, quality of life, anxiety and depression. Finally, it has been demonstrated that the cost-effectiveness of group ACT, both in terms of government expenditures and health services, is higher than the pharmacological treatment recommended for fibromyalgia patients (Luciano et al. 2017).

Mindfulness Based Psychological Interventions

Mindfulness can basically be defined as a practice that enables the individual to direct his attention to his current experience,

to observe and accept his experience without judgment. In mindfulness-based therapies, it is aimed to reduce the effects of dysfunctional thoughts and beliefs, to increase metacognitive insight, to gain emotion and attention regulation skills, and to reduce avoidance behaviors through internal exposure by making use of meditation, cognitive and experiential exercises (Çatak and Ögel 2010). Mindfulness practices used in medical situations aim to provide contributions such as reducing the perceived severity of pain in patients, increasing tolerance to pain and disability, reducing the use of painkillers, anxiolytic and antidepressant drugs, and thus reducing the negative effects of these drugs, making choices for medical treatment and increasing treatment adherence, diet, increasing adaptation to vital changes such as physical activity, improving interpersonal relationships and social connections (Ludwig & Kabat-Zinn, 2008).

It is seen that mindfulness-based stress reduction methods and meditation practices are frequently used in chronic pain populations and significant progress has been made (Hassett and Gevirtz 2009, Perez-Aranda et al. 2017). However, mindfulness-based meditation practices can be cognitively challenging as they require long-term attention. Therefore, it is thought that it is not an appropriate intervention method for all fibromyalgia patients (Adler-Neal and Zeidan 2017).

Biofeedback

It has been observed that biofeedback treatments have positive effects on pain, sleep pattern and quality, fatigue and headache symptoms in fibromyalgia patients (Mueller et al. 2001, Kayıran Dursun et al. 2010, Jensen et al. 2013). In addition to fibromyalgia symptoms, it was found that with approximately 10 weeks of biofeedback treatment, the depression and somatic symptom levels of the patients decreased, and their functionality increased (Hassett et al. 2007, Caro and Winter 2011). In addition, it was observed that effective results were obtained to reduce the effect of fibromyalgia as a result of the biofeedback treatment applied for perceived self-efficacy and ability to manage the disease (Reneau 2020). In addition to all these benefits, the compliance rate of patients with biofeedback treatments is higher than other treatment methods (Huyser et al. 1997). In this context, the use of biofeedback in fibromyalgia patients is considered to be one of the promising intervention methods.

Adherence to Treatment

Physical activity and exercises are among the most basic components of the treatment programs of fibromyalgia patients. However, due to undesirable effects such as fatigue, muscle pain, and stiffness, treatment adherence is low and giving-up rate is high in treatment plans that include exercise (Sandstorm and Keefe 1998, Busch et al. 2009, Lorente et al. 2014). In this context, when creating a treatment plan for a fibromyalgia patient, it is important to know in advance the factors that will negatively affect the patient's adoption and maintenance of the exercise program and to be able to intervene in these areas (Scioli-Salter et al. 2020). For example, Scioli-Sater et al. (2020) suggested that self-efficacy is a significant predictor of compliance with exercise program in fibromyalgia patients. In this context, it is considered essential to work on the patient's level of coping with stress, self-efficacy, and beliefs about pain in the treatment plan of a patient to whom psychotherapy will be applied, in order to increase the patient's level of compliance with the treatment plan (Busch et al. 2009). For example, 30-60 minutes of motivational interviews are recommended to improve the patient's self-efficacy beliefs about physical exercises (Dupree Jones et al. 2004). However, it is thought that integrating physical exercises with self-management exercises such as coping skills will increase the level of adherence with the physical exercise program and the effectiveness of the program (Sandstorm and Keefe 1998). In addition, fibromyalgia patients have a low level of adherence not only to physical exercise programs but also to pharmacological treatments (Dobkin et al. 2006). It is predicted that increasing the cooperation between the patient and the physician and taking an active role in creating treatment plans will increase the level of adherence to pharmacological treatments (Dobkin et al. 2006).

Discussion

When the studies are examined in general, it is seen that the etiology of fibromyalgia is largely unclear and this situation prevents the determination of the areas that should be focused on in the treatment plans. Due to the lack of an effective method to cure the disease, it is aimed to increase the functionality of the patients and to minimize the negative effects of the disease in general treatment plans. As a result of this review, pain-related beliefs and avoidance behaviors, self-efficacy, self-compassion, physical activity level, sleep quality, pain-related beliefs and avoidance behaviors, catastrophizing, emotional skills, coping strategies, personality, accompanying psychopathologies It is seen that factors such as the development of the disease, the duration and severity of the pain, and the compliance of the patients with the treatment. Based on these findings, it was thought that, in the treatment process of the disease, psychologists' interventions to improve sleep quality and keep the physical activity level at an optimal level; increase self-efficacy, self-compassion and emotional skills; teaching effective coping strategies; changing the maladaptive beliefs, attitudes and behaviors towards pain and disease with compatible ones would reduce the negative effects of fibromyalgia and increase the psychosocial and physiological adaptation to the disease. In addition to these, it has been observed that depression, anxiety disorder, somatization and traumatic experiences negatively affect adherence to the disease, and it has been deduced that it will be beneficial to work on these problems during the treatment process.

When the literature was examined, it was seen that among the non-pharmacological fibromyalgia treatments, CBT and psychoeducation were the most prominent intervention methods in terms of effectiveness and frequency of use. In addition, many studies have been found showing that ACT, compassion-focused therapies, mindfulness-based therapies, techniques for emotion expression and regulation, and biofeedback are effective on the factors that increase the severity of fibromyalgia effects and

functionality. However, since the effects of these intervention methods are limited, they are recommended to be used together with treatment methods such as CBT and exercise, taking into account the individual characteristics and needs of the patients (Hassett and Gevirtz 2009, Lumley et al. 2012, Kirby 2017, Albajex and Moix 2021).

Since the factors that determine the effect of fibromyalgia on the person are very broad, the views that treatment plans should be individualized come to the fore in the literature, and the findings support these views (Friedberg and Jason 2001, Roy 2008, Hassett and Gevirtz 2009). In this context, it is thought that examining the person's attributions to pain, cognitive and emotional processes that affect pain severity, predisposing personality traits and psychopathologies with appropriate assessment-evaluation tools and a comprehensive clinical interview will play an important role in determining the most appropriate treatment goals for the individual, and therefore in the effectiveness of treatments.

The biopsychosocial model assumes that fibromyalgia is the result of many biological, genetic, psychological and social factors and their interactions, and the findings in the literature support this approach. From this point of view, it can be deduced that intervention in fibromyalgia in a single area will not yield effective results. In the treatment of fibromyalgia, it is clear that a multidisciplinary treatment process, which will be carried out in cooperation with professionals from many disciplines such as psychiatrists, rheumatologists, physiotherapy and rehabilitation specialists, psychologists, physiotherapists, family physicians, will be more effective than the treatments applied by a single professional (Hassett and Gevirtz 2009, Perez- Aranda et al. 2017). However, Hassett and Gevirtz (2009) suggest that a comprehensive and multidisciplinary treatment plan can be challenging for healthcare professionals who are not working in an academic setting. For this reason, they emphasized that patients should get support from web-based innovative applications in subjects that they can help themselves such as sleep hygiene, activity tracking, relaxation. However, in order to benefit from these applications effectively, factors such as the patient's age, education level, and internet literacy should be taken into account. In addition, it is recommended to develop and use innovative web-based applications to support cooperation and communication between professionals who will take part in multidisciplinary treatments.

Numerous studies have been conducted to investigate the psychosocial impact of fibromyalgia disease. These studies show that there are many factors that predict the impact of the disease, but there is more need for causal inferences in order to increase the effectiveness of the treatment of the disease. In addition, studies showing patterns of association between individual differences and fibromyalgia symptoms are also needed. It is recommended that future research be conducted in this direction.

Conclusion

To conclude, it is thought that a higher level of efficiency can be obtained from the treatments with the cooperation of professionals from different disciplines and individualized treatment goals in the treatment processes of fibromyalgia disease. In this context, the psychological factors that are seen to be associated with the impactmof fibromyalgia in the literature and the psychological intervention methods that are supposed to be effective on them were examined and attention has been drawn to the importance of psychologists' involvement in fibromyalgia treatments.

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