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# Factors related to the painful conditions of patients with fibromyalgia in Maringá, Paraná state, Brazil

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**ABSTRACT.** This study aimed to obtain personal and clinical characteristics of patients with fibromyalgia, and to identify the factors responsible for the initiation, recurrence or intensification of painful state in each patient. The information was collected using General Characterization Form of Fibromyalgia Patients, consisting of 32 questions about personal data, location, and type of pain, identification of factors or circumstances related to the algetic state, physical activity, and pharmacological treatment. Among 14 patients included in this study, 85.71% were female. The pain intensity and time span varied among patients, and 42.85% of them presented pain (algetic state) lasting between 6 to 10 years. Emotional trauma was the factor or circumstance related to the onset of symptoms of 71.43% of the patients. All patients reported that stressful situations resulting from conflicts in the family, social or work environment are factors responsible for reactivating and intensifying the symptoms of fibromyalgia. Factors and circumstances related to the onset, recurrence, and intensity of fibromyalgia symptoms reveal that it is necessary to inform patients that it is a benign disease, despite the painful condition, since the way they respond to daily events is a determining factor in the course of the disease. Improving physical conditioning and conducting cognitive-behavioral therapy, along with pharmacological treatments, can be successful in treating or minimizing the symptoms of fibromyalgia.

**Keywords:** fibromyalgia; chronic pain; daily activities; stress

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## Introduction

The prevalence of widespread chronic pain is about 10% worldwide. The correct diagnosis is the most challenge for the physician, since many painful diseases and/or syndromes like inflammatory arthritis, spondyloarthropathies, autoimmune connective tissue disease, myositis, myopathy, primary generalized osteoarthritis, rheumatic polymyalgia, and some malignancies may present symptoms similar to those of fibromyalgia, Yunus and Aldag (2012), Adams and Turk (2015), Cohen (2017). Fibromyalgia syndrome (FMS) is a condition characterized by chronic and generalized skeletal muscle pain, which can be assessed clinically by a marked sensitivity to specific tender points, fatigue, exhaustion, irritability, sleep disorders, cognitive impairment, diarrhea and/or constipation, dry mouth and anxiety according to Martinez, Panossian and Gavioli (2006), Santos et al. (2006), Cohen (2017).

Due to the absence of typical signs in physical examinations and the lack of laboratory and complementary tests, the diagnosis of fibromyalgia is based on clinical observations and is usually established from the exclusion of other rheumatologic diseases, neurological syndromes, and depression, Provenza et al. (2004), Kia and Choy (2017). Since etiology and pathogenesis of fibromyalgia remain obscure, it is important useful methods that characterize fibromyalgia patients. The process should be easily administered, not require much time in its application and be able to trace a profile of similarity between the majority of patients affected by the disease, besides guiding studies to identify possible triggering situations of the painful state, Martins, Polvero, Rocha, Foss and Santos Junior (2011), Bazzichi et al. (2016).

The use of research forms is a useful method to characterize a group in some health area, enabling the collection of essential data on diseases or syndromes, Santos et al. (2006), Martins et al. (2011), Bazzichi et al. (2016).

The aim of this study was collected data from fibromyalgia patients focused on their social, occupational and clinical characteristics, in order to identify the facts that lead to the onset of the disease, the recurrence or intensification of the painful state and their relation to physical activity and pharmacological treatment.

## Methods

### Patients screening and active search

Patients from the municipality of Maringá, State of Paraná, Brazil, were screened through a consultation in the information system of the State Secretary of Health (SESA/PR). It was included in this study those with International Classification of Diseases ICD R52 or M79 as justification for pharmacological treatment of chronic pain.

After the first contact, the patients who had physician diagnosis of fibromyalgia syndrome (FMS), were selected and invited to participate in this study, which was approved by the Research Ethics Committee of the State University of Maringá (protocol number 004/2012 COPEP/UEM). All participants signed the Informed Consent Term.

### Data collection

Data was collected individually through the General Characterization Form of Fibromyalgia Patients proposed by Konrad, Lopes, Nahas, and Martinez (2009). This form is self-applicable and consists of 32 questions that cover personal data (gender, age, occupation, marital status, education level), information regarding the medical specialty of the physician responsible for the diagnosis of FMS, the location and type of pain, the identification of factors or circumstances related to the onset of painful state, the practice of physical activity, and pharmacological treatment.

### Identification of factors and circumstances related to recurrence or intensification of the algetic state

After data collection, all patients were followed once a week for 42 days. In this period, they were encouraged to report their daily activities allowing the identification of some circumstances related to recurrence or intensification of the algetic state. After detecting any factors, the patients were oriented about changes of attitude that could beat the adversities, and consequently attenuate the symptoms of FMS.

## Results

At the beginning of 2013, there were 1451 patients registered in the 'Paraná Sem Dor' program, in the municipality of Maringá, state of Paraná, Brazil. This program was developed and funded by SESA/PR, which provides users with a list of medications for the treatment of chronic pain. The information system of SESA/PR was consulted, and it was possible to identify 190 patients with ICD R52 e M79 which justified the registration to receive the medicines. All 190 patients were contacted, and 23 meet the requirements of this study, with FMS diagnosis certificated by a physician. However, only 14 patients accepted to participate in the study, seven patients were diagnosed by rheumatologists, three (21.42%) by orthopedists, two (14.29%) by neurologists and two (14.29%) by other medical specialties. In this group, 12 were female (85.71%) and two males (14.29%). Only two patients (14.29%) were single, three (21.43%) were divorced, and nine were married (64.28%). The mean age was fifty years and five months, ranging from 30 to 63 years, more than half of the patients (57.14%) were older than 50 years. Regarding the occupational profile, four patients (28.58%) were not working due to FMS, and two patients (14.29%) were retired, and the others worked in different areas.

The description of pain intensity varied from mild, (moderate or) to severe and rarely absent. The nature of the pain was described as burning, shooting, sharp pain, pulsatile or compressive, often located in the neck, shoulders and posterior trunk, but could become generalized, reaching arms, legs, hands, and feet.

In addition, patients also reported depressive, anxiety, and sleep disorders, especially non-restorative sleep, morning stiffness, fatigue, tiredness (exhaustion), paresthesia in the extremities and cognitive disorders. Almost half of the patients (n = 6) presented the algetic state lasting between 6 to 10 years (Table 1).

**Table 1.** Duration of painful state in fibromyalgia patients.

Time (years)	Patients (n)	%
<1	1	7.14
1 – 5	2	14.29
6 – 10	6	42.85
11 – 15	3	21.43
>15	2	14.29

Table 2 shows the time interval between the onset of pain and the diagnosis of FMS attested by a physician. It should be noted that one month was the shortest period reported by one patient, while the most extended time interval was 15 years and the mean was 6 years and 5 months.

**Table 2.** Time interval between the onset of painful state and the diagnosis of FMS.

Time (years)	Patients (n)	%
<1	3	21.43
1 – 5	5	35.71
6 – 10	3	21.43
11 – 15	3	21.43

The majority of patients (71.43%) described an emotional trauma that occurred in childhood or in adulthood, as a factor or circumstance related to the onset of FMS symptoms, mainly painful state. For the other patients (n = 4), physical trauma was the determining factor for the beginning of symptoms. A total of nine patients (64.29%) stated that do not practice physical activity, mainly due to pain and fatigue, demonstrating the impact of FMS on the ability of patients to perform regular physical activities. The other patients practice some physical activity, usually walking or stretching, often 1 to 3 times a week, as shown in Table 3.

**Table 3.** Weekly frequency of physical activity practiced by fibromyalgia patients.

Weekly frequency of physical activity	Patients (n)	%
0	9	64.29
1	1	7.14
≥ 3	4	28.57

Table 4 shows the pharmacological classes of medicines used to treat the algetic symptoms, depression and anxiety. Four patients (28.57%) were taking analogs of neurotransmitter GABA (Pregabalin and Gabapentin); two (14.29%) weretaking tricyclic antidepressants (Amitriptyline hydrochloride or Clomipramine), five (35.71%) were taking selective serotonin reuptake inhibitors (Venlafaxine Hydrochloride, Fluoxetine or Duloxetine, and Citalopram); two (14.29%) were taking benzodiazepines (Diazepam and Clonazepam), and 1 patient (7.14%) did not use any medication at the time of data collection, because he stopped the medication on his own due to weight gain and decreased libido but sporadically used steroidal anti-inflammatory drugs.

**Table 4.** Pharmacological agents used to treat symptoms related to painful state, depression and anxiety in patients with FMS.

Pharmacological class	Patients (n)	%
Analogues of neurotransmitter GABA	4	28.57
Tricyclic antidepressant	2	14.29
Selective serotonin reuptake inhibitors	5	35.71
Benzodiazepines	2	14.29
Steroidal anti-inflammatory drugs	1	7.14

All patients reported that stressful situations resulting from family, social or labor conflicts, are responsible for recurrence or intensification of FMS symptoms. However, besides stressful events, other concomitant circumstances were related as alterations in emotional state (especially sadness), excessive physical effort and climatic variations (Table 5).

**Table 5.** Circumstances related to the intensification of painful state.

Class	Patients (n)	%
Stressful event	14	100
Different emotional states	13	92.86
Excessive physical effort	11	78.57
Climatic variation	11	78.57

## Discussion

FMS patients draw upon the health services more often than the general population. Five to ten percent of the patients seen in outpatient clinics are fibromyalgia patients, Kia and Choy (2017). FMS has been recognized as a disease of unknown etiology since 1990. The clinical diagnosis is a challenge due to the absence of laboratory markers (biochemical or immunological) or anatomical modifications that could be detectable in imaging tests, Martinez et al. (2006), Heymann et al. (2010). Most cases of FMS are diagnosed through clinical analyses based on the history of symptoms, Heymann et al. (2017).

This study included patients who agreed to participate and had a clinical diagnosis of FMS certified by a physician. As FMS is a rheumatologic disease, about 50% of participants were diagnosed by a rheumatology specialist. The other patients were diagnosed by a physician with other specialties such as orthopedist, neurologist, and others. Besides the diagnosis, the FMS patient needs to be monitored individually, which requires a multidisciplinary team involving rheumatologists, neurologists, psychiatrists, and other health professionals, as there is a dysfunction in the processing of pain, the intensification of pain, and the emotional factor that also influences the evolution of the disease Martinez, et al. (2006), Heymann et al. (2017). The correct diagnosis avoids unnecessary complementary tests, as well as the prescription of less effective medicines, which contributes to less burden on public health services Annemans et al. (2008), Heymann et al. (2010). Through the application of General Characterization Form of Fibromyalgia Patients, it was possible to verify that the mean age of the patients was 50 years, ranging from 30 and 63 years, and the majority of patients were female (81.71%). These results are in agreement with the reports of several authors who described the prevalence of FMS in women in the proportion of 6-10:1, with an average age ranging from 35 to 44 years of age, Provenza et al. (2004), Santos et al. (2006), Martins et al. (2011), Ramiro et al. (2013), Clauw (2014), Heymann et al. (2017), Marques, Santo, Berssaneti, Matsutani, and Yuan (2017).

The majority of the patients (64.28%) were married. The stable relationship in marriage can provide relative emotional stability. Conversely, difficulties in the marital interaction may arise due to pain, fatigue, irritability, sleep disorders, low libido and frequency of sexual intercourse, which may cause family conflicts, frustration with the marital relationship, and lead to the occurrence or intensification of FMS symptoms, Penido, Fortes, and Rangé (2005), Ramiro et al. (2013).

Depending on pain intensity, fibromyalgia can cause incapacity. However, the majority of the patients exerted their labor activities and rarely missed work, whereas 4 patients (28.57%) do not have employment on account of FMS, confirming that fibromyalgia patients present difficulties in exerting labor activities. In addition, FMS was considered one of the three leading causes of benefits granted to the National Social Security Institute (INSS), Penido, et al. (2005), Medeiros, Zerbini, Cintra, Gianvevecchio, and Muñoz (2012). It should be emphasized that an unsatisfactory work environment can generate personal distress, and consequently trigger or intensify the symptoms of FMS, Martinez et al. (2006), Ramiro et al. (2013), Freitas, Andrade, Spyrides, Micussi, and Sousa (2017).

The main symptom of FMS is chronic and diffuse pain, but it is not easy for the patients to define the exact pain point. In addition, the FMS clinical state may be similar to other diseases related to chronic pain, Provenza et al. (2004), Martinez et al. (2006). This group of patients reported pain intensity ranging from mild to severe, and rarely absent. The perception of the painful sensation relies on nociceptive stimulation, central pain mechanisms, cortical circuits, emotional, psychological and behavioral response, which varies from each individual, Smith, Harris, and Clauw (2011), Yunus and Aldag (2012), Clauw (2014). Table 1 shows that almost half of the patients (42.85%) presented analgetic state ranging from 6 to 10 years, but there is no consensus regarding their etiology or a specific factor or agent related to the onset of FMS. FMS symptoms are insidious, especially in adult life, and are preceded by skeletal muscle pain episodes, infection diseases, surgical procedures, physical or emotional trauma, Yunus and Aldag (2012), Goulart, Pessoa, and Lombardi Junior, (2016), Freitas et al. (2017).

The mean time interval between the beginning of symptoms and the diagnosis was six years and five months. It is possible to note that in 21.43% of the patients ( $n=3$ ) the time interval elapsed until the diagnosis was less than a year. The longest time interval was 15 years (Table 2). These data are in accordance with, Penido et al. (2005) that reported a group of fibromyalgia patients who wait about seven years to get the diagnosis. This delay in receiving the FMS diagnosis is probably the cause of much suffering for the patient with unexplained chronic pain. Currently, there is more knowledge about symptoms and diagnostic criteria of FMS, but caution is needed to avoid false-positive diagnosis.

Emotional trauma was reported by 71.43% of the patients ( $n=10$ ) as the leading factor for the onset of the FMS symptoms. Some emotional traumas are the result of childhood sexual abuse, and others are related to accidents or to death of a close relative. Traumas resulting from sexual violence associated with FMS symptoms onset deserves special attention in the scientific community since those patients describe great difficulty in their daily activities when compared with the other patients who reported other types of traumatic episodes. Filippon, Bassani, Aguiar, and Ceitlin (2013) described similar complain from patients under this situation, as well as the inability to fulfill daily tasks, more intense painful sensation, incapacity to perform usual activities, affective disorders, leading to loss of ability to handle with the functions of adult life, due to failure in emotional structure.

Although still speculative, there is a possibility that traumatic episodes are associated with FMS. However, to establish this association, additional studies are needed to obtain more data on the classification of the type of trauma; duration and intensity of the traumatic episode (single or repetitive event); the age of the patient when the traumatic incident occurred; time interval between emotional trauma and the onset of FMS symptoms; in order to evaluate whether the memory of the traumatic event, if in thought or in dialogue, could trigger or intensify the state of pain, Filippon et al. (2013), Goulart et al. (2016). Thus, it would be possible to identify the etiology or factors that, if controlled, can minimize the progression of FMS.

Although the symptoms of FMS are similar to all patients, there is no gold standard treatment, given that the patients receive drug-based or not, different therapies protocols, Heymann et al. (2017). Pharmacological therapy includes classic analgesics, antidepressants, and anticonvulsants to relieve the pain, improve the quality of sleep, and maintain or reestablish emotional balance, Moreno, Moreno, and Soares (1999), Provenza et al. (2004), Heymann et al. (2010), Kia and Choy (2017). The practice of physical activity is also helpful in the treatment of FMS; however, it should be well oriented and not exceed the capacity of the patient, Heymann et al. (2017). In Table 3, it is shown that four patients (28.57%) performed physical activity, usually walking, more than three times a week. And the other patients almost did not practice any physical activity, probably due to the depressive state or the intolerance to physical exercises, Steffens et al. (2011).

Table 4 shows the class of pharmacological agents used by patients. As described by Heymann et al. (2010), Kia and Choy (2017), analogs of neurotransmitter GABA (Pregabalin and Gabapentin) used by 4 patients (28.57%) are effective in reducing the pain of fibromyalgia patients; the tricyclic antidepressant (Amitriptyline Hydrochloride) taken by 2 patients (14.29%) reduces pain and often improves functional capacity by treating depression and anxiety; selective serotonin reuptake inhibitors (Venlafaxine Hydrochloride, Fluoxetine, Duloxetine, and Citalopram) prescribed for 5 patients (35.71%) should be analyzed on a case-by-case basis as duloxetine and fluoxetine in high doses (above 40 mg) or combined with tricyclic antidepressant reduces pain and improves functional capacity, but there is no consensus regarding the use of venlafaxine. As for citalopram and benzodiazepines (Diazepam and Clonazepam), used by 2 patients (14.29%), are not recommended for the treatment of FMS.

Despite the therapies currently applied to treat FMS, there is still no treatment, drug-based or not, capable to completely eliminates the symptomatology of the disease. Therefore, FMS still has no cure, and every treatment is a challenge for physicians and patients, and more research is needed to determine if pain management relieves the symptoms of depression and, likewise, if relief from depressive symptoms improves the pain and its morbidity, Castro et al. (2011), Cohen (2017), Kia and Choy (2017).

Table 5 shows several factors related to the recurrence or intensification of pain. All patients reported that when the daily routine is broken by adverse situations that result in emotional or physical stress, anxiety, and behavioral changes, an exacerbated painful response, mood destabilization, depression and alteration in the frequency of restful sleep are triggered. Similarly, patients studied by Reis and Rabello (2010) also presented cognitive disorders, excessive attention to harmful stimuli, inadequate reaction to

pain and emotional liability to remember painful experiences. Recent studies suggest that patients with FMS show reduced functionality, higher perception of stress and greater intensity of depressive symptoms than healthy individuals, Martinez et al. (2006), Becker et al. (2010), Reis and Rabello (2010), Homann et al. (2012), Filippon et al. (2013), Ramiro et al. (2013), Freitas et al. (2017).

At the beginning of this study, all patients were found to be less able to react to stressful situations, arguing that FMS was an obstacle to individual resilience. In a period of 42 days, all patients were followed weekly and oriented to develop strategies to overcome or ignore stressful events. With the development of these strategies, it was observed a decrease in the intensity of FMS symptoms in some patients, due to the fact that they have developed more excellent safety and control in the face of stressful situations and of onset of pain. Therefore, the existence of a thin line between stress and FMS is evident. However, it was not possible to establish a relationship between stress and the risk of disease development. This correlation should be better evaluated through longitudinal and prospective studies, Becker et al. (2010), Freitas et al. (2017).

Other circumstances related to the intensification of pain are climatic variation with higher sensitivity to cold weather, exaggerated physical exertion, changes in the emotional state, especially sadness without precedent cause. These circumstances may be related to the human organism that identifies the changes present in the environment, whether positive or negative. In a stress situation, the Hypothalamic-Pituitary-Adrenal (HPA) and Adrenomedullary (SAM) axes are activated, and behavioral changes can occur due to hormonal, physical, and cognitive components. These changes aim to increase the chances of survival, protecting and preserving the individual in an adverse environment, Reis and Rabelo (2010). However, the hypothalamic-pituitary-adrenal (HPA) axis is altered in patients with fibromyalgia and depressive symptoms, contributing to the occurrence of neurotransmission changes in serotonergic and noradrenergic pathways that are closely linked to the development of depressive and painful symptoms, Nunes, Nunes, Moraes, and Uemura (2012).

## Conclusion

In conclusion, it is necessary to inform the patient and his relatives about the benign nature of FMS, and that a positive attitude influences the evolution of the disease. Treatment should be performed by a multidisciplinary team that understands the expectations of patients. The objectives of the therapy should be traced with the active participation of the patient and should contemplate the improvement of the physical condition and the accomplishment of the cognitive-behavioral therapy that, together with the pharmacological treatment, can promote the improvement of the quality of life and minimize the symptoms of FMS.

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