Stress perception and depressive symptoms: functionality and impact on the quality of life of women with fibromyalgia

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ABSTRACT

Introduction: Depression is one of the most frequent psychiatric comorbidities in patients with fibromyalgia (FM), and chronic stress might be one of the triggering events of the characteristic FM symptoms. **Objectives:** To compare depressive symptoms and stress perception between women with and without FM, in addition to investigate the relationship between those characteristics and the functionality and the impact on the quality of life of those patients. **Methods:** The study included 20 women with FM (FM group) and 20 healthy women (control group). The following instruments were used: Beck Depression Inventory, Perceived Stress Scale-10, Health Assessment Questionnaire, Fibromyalgia Impact Questionnaire, and Visual Analogue Scale for pain (0–10 cm). **Results:** The FM group showed higher severity of the depressive symptoms (24.10 ± 11.68) and greater perception of stress (25.10 ± 4.82) as compared with those of the control group (10.20 ± 12.78, $P < 0.01$; and 15.45 ± 7.29, $P < 0.01$; respectively). A higher incidence of depressive symptoms was observed in the FM group (75%) than in the control group (25%) ($\chi^2 = 10.00$, $P < 0.01$). In the FM group, a positive correlation was observed between the depressive symptoms and perceived stress ($r = 0.54$, $P < 0.05$), pain ($r = 0.58$, $P < 0.01$), impaired functionality ($r = 0.56$, $P < 0.01$), and impact on the quality of life ($r = 0.46$, $P < 0.05$). In this group there was also correlation between perceived stress and impaired functionality ($r = 0.50$; $P < 0.05$). Pain showed no relationship with perceived stress. **Conclusion:** The relationship between stress, depression and functionality seems to be part of a complex mechanism, which might affect the quality of life of patients with FM.

Keywords: pain, psychological stress, depression, fibromyalgia.

INTRODUCTION

Fibromyalgia (FM) is characterized by chronic pain, which is accompanied by some symptoms such as fatigue, morning stiffness, changes in sleep, and depression.[1] Depression is one of the most frequent psychiatric comorbidities in patients with FM, with a prevalence of 20%–80%.[2] In fact, patients with FM are approximately five times more likely to experience depression than healthy individuals.[3] Even without a formal diagnosis, depressive symptoms affect approximately 40% of those patients.[4]

Depression can trigger or aggravate the characteristic symptoms of FM.[5] Among the several events that aggravate those symptoms, emotional stress, reported by 83% of the patients,

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stands out.[6] It is worth noting that 42% of those individuals identify chronic stress as the trigger event of their symptoms.[6]

Acute stressing events are believed to precede the depressive symptoms,[7] because the daily generation of stress might play a role in both maintaining and increasing the probability of the depression recurrence. Thus, stress generation can account for the frequent chronic course of depression.[8]

However, the causal relation between stress and depression in FM does not seem to be linear, but repetitive, and, frequently, patients get stuck in a vicious cycle.[9] Thus, both acute and chronic stresses are involved in triggering depression, and the negative effects of the chronic condition seem to amplify the association between acute daily events and depressive symptoms.[10]

The depressive symptoms impair the quality of life of patients with FM[11,12] by increasing the sensation of pain and the perception of functional disability.[13,14] In fact, depression is an independent predictor of the physical performance variation in those patients.[15] Thus, factors that intensify the depressive symptoms should be controlled to guarantee the improvement in the quality of life of patients with FM.

Data on the relationship between stress, functionality, depressive symptoms and quality of life of patients diagnosed with FM are still scarce. To identify that relationship is paramount to provide a more effective treatment to that population.

This study aimed at comparing the psychological aspects (perception of stress and depressive symptoms) between women with and without FM and at investigating the possible relationship of those aspects with pain, functionality, and quality of life in women with FM.

METHODOLOGY

Type of the study and subjects of study

This descriptive-comparative cross-sectional study was approved by the Committee of Ethics and Research in Human Beings of the Hospital de Clínicas of the Universidade Federal do Paraná (CEP/HC-UFPR, protocol #2284.178/2010-07), Curitiba, PR, Brazil, and followed the guidelines of the Resolution 196/96 of the National Health Board on research involving human beings.

This study comprised 40 women aged between 29–52 years and divided into the following two groups: 1) FM group – 20 women diagnosed with FM according to the American College of Rheumatology (ACR) criteria[1] and originated from the Rheumatology Outpatient Clinics of the HC/UFPR; 2) control group (CG) – 20 healthy women, paired by age and Body Mass Index (BMI), originating from the community and employees of the UFPR. The selection for the FM group was intentional, based on information from the medical records made available by that Rheumatology Outpatient Clinics. The inclusion criteria established were as follows: age between 20–55 years, BMI between 18.50–39.99 kg/m^2, neither psychiatric nor neurologic disorders diagnosed, and availability to participate in the study.

After providing written informed consent, the participants underwent anthropometric assessment and physical examination to identify the tender points (TP). Then, the following instruments were applied: Beck Depression Inventory (BDI), Perceived Stress Scale-10 (PSS-10), Health Assessment Questionnaire (HAQ), Fibromyalgia Impact Questionnaire (FIQ), and Visual Analogue Scale (VAS) for pain (0–10 cm).

Anthropometric assessment and physical examination

Body mass (digital scale) and height (fixed wall-mounted stadiometer) were measured according to the Anthropometric Standardization Reference Manual[16] for obtaining the BMI, classified according to the World Health Organization.[17]

The TP were assessed in both groups by the same examiner using the digit pressure technique, with strength equivalent to 4 kgf in each painful point, according to the ACR.[1]

Assessment of perceived stress

To assess perceived stress, the PSS-10, proposed by Cohen et al.[18] and validated for the Brazilian population by Reis et al.,[19] was used.

The PSS-10 is a self-reported global measure of the degree to which situations in one's life are appraised as stressful. The scale comprises 10 items relating events and situations that occurred in the last 30 days. Each item is assessed by use of a Likert scale, in which 0 means never, and 4, very often. Of the 10 items, six refer to negative aspects (1, 2, 3, 6, 9, and 10) and four refer to positive aspects (4, 5, 7, and 8). For the final score, the four positive items should be inversely punctuated and, then, all items should be added. The results can vary from 0–40, and a higher score indicates greater perception of stress.[19]

Assessment of the depressive symptoms

The BDI, proposed by Beck et al.[20] and validated for the Brazilian population, was used.[21] That self-assessment instrument is widely recognized in several countries, and determines the prevalence and intensity of depression in both psychiatric patients and the non-clinical population. Its predictive value is approximately 90%.[21,22] The BDI has

proved to be a sensitive instrument to assess depression in patients with FM.[23]

The BDI comprises 21 items that assess depressive attitudes and symptoms, with four options of answer (0–3). The higher the score obtained, the greater the severity of the aspect assessed. The cut-off points depend on both the nature of the sample and the objectives of the study. In non-diagnosed samples, the recommended cut-off points are: ≤ 15 (normal or mild depression), 16–20 (dysphoria), and > 20 (depression).[22] Despite the different approaches used to identify depression, Gorenstein et al.[21] have reported that a score greater than 16 already indicates its possibility.

Assessment of functionality

Functionality was measured by use of the HAQ proposed by Fries et al.[24] in its version translated and validated for the Brazilian population.[25] The HAQ is divided into the following eight components: dressing and grooming; arising; eating; walking; hygiene; reach; grip; and common daily activities. Each component is approached in two or three questions, in a total of 20 questions. Each question offers four answering options (0–3), and the individual should pick one. The higher the score, the greater the individual's disability. A final score was categorized as follows: 0–1, mild to moderate difficulty; 1–2, moderate difficulty to severe disability; and 2–3, severe to very severe disability.[26]

Assessment of the impact on quality of life

To assess the impact of FM on the participants' quality of life, the FIQ proposed by Burckhardt et al.[27] and translated and validated for the Brazilian population was used.[28] The FIQ is a specific questionnaire developed to assess the FM impact on the quality of life of the patients and is composed of the following ten items: physical functioning; well-being; work missed; work difficulty; pain; fatigue; stiffness; sleep; anxiety; and depression.

The FIQ questions should be answered based on the respondent's perception of the last seven days. The final score varies from 0–100, and the highest score indicates the greatest impact of FM on quality of life.

Assessment of pain severity

A 10-cm VAS, in which 0 stands for lack of pain and 10 stands for unbearable pain, was used. In the present study, the severity of pain (milder, stronger and intermediate) was assessed in the last week and at the time of the assessment. The mean of four measurements reflects pain severity more accurately than one single measure, avoiding both underestimating and overestimating that characteristic by the individuals.[29]

Statistical treatment

The data were analyzed by using the Statistica software (Statsoft Inc., version 7.0). The normality of the data was checked by using the Shapiro-Wilk test, and the homogeneity of the variances, when comparing both groups, by using the Levene's test. Pearson correlation and the independent *t* test were used for the parametric data, and the Spearman correlation and the Mann-Whitney *U* test, for the non-parametric data. The chi-square test was used to assess differences regarding proportions. The significance level of $P \leq 0.05$ was adopted.

RESULTS

Table 1 shows the general characteristics of the sample. The FM group had a greater number of TP, greater pain severity, more difficulty in performing daily activities, and a greater impact on the quality of life as compared with those of the CG.

The BDI scoring is shown in Figure 1. Patients with FM have more severe depressive symptoms, and the proportion of those patients with possible depression (≥ 16 points) was 75% *versus* 25% in the CG ($\chi^2 = 10.00$; $P < 0.01$).

The PSS-10 scoring is shown in Figure 2. The FM group had a higher perception of stress (FM group: 25.10 ± 4.82 *versus* CG: 15.45 ± 7.29).

Table 2 shows the correlations between the variables assessed in the study for the FM group. Although stress had a positive correlation only with greater difficulty in performing daily activities and greater depression, depression was found to correlate with most of the variables studied (pain, functionality, stress, and impact on quality of life).

Table 1
General characteristics of the sample

	FM (n = 20) mean ± SD	CG (n = 20) mean ± SD	P
Age (years)	41.80 ± 6.14	39.80 ± 6.47	0.38
Body mass (kg)	67.41 ± 10.81	68.88 ± 14.29	0.72
Height (cm)	157.71 ± 5.54	159.36 ± 5.85	0.37
BMI (kg/m²)	27.08 ± 4.02	27.05 ± 4.94	0.97
Number of TP (0–18)	13.95 ± 4.27	0.80 ± 1.36	< 0.01
Pain (0–10)	5.99 ± 1.72	1.72 ± 1.58	< 0.01
HAQ (0–3)	1.54 ± 0.64	0.16 ± 0.24	< 0.01
FIQ (0–100)	68.88 ± 15.04	22.66 ± 14.05	< 0.01

FM: fibromyalgia; CG: control group; SD: standard deviation; BMI: Body Mass Index; TP: tender points; HAQ: Health Assessment Questionnaire; FIQ: Fibromyalgia Impact Questionnaire.

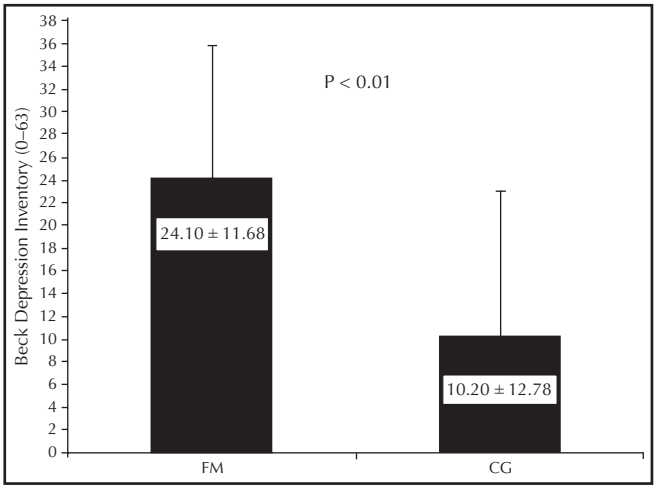

Figure 1
Comparison of the severity of the depressive symptoms between the group of patients with fibromyalgia (FM) and the control group (CG).

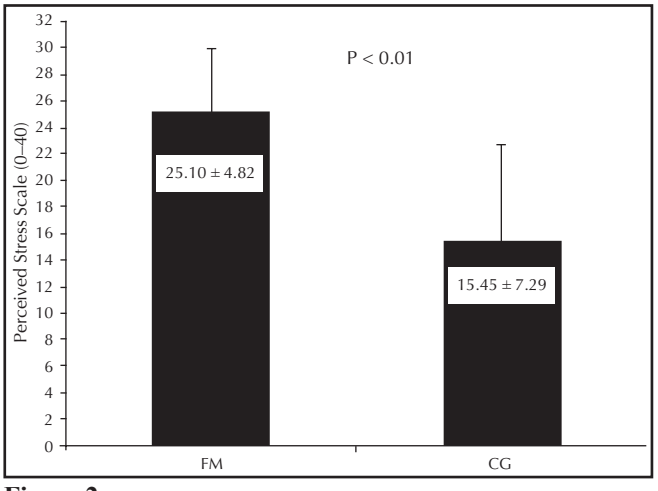

Figure 2
Comparison of the stress perceived between the group of patients with fibromyalgia (FM) and the control group (CG).

Table 2
Correlation between pain, functionality, quality of life, perception of stress, and depression in the FM group

	No. of TP	Pain	HAQ	FIQ	PSS-10	BDI
No. of TP	–					
Pain	0.11	–				
HAQ	0.33	0.47*	–			
FIQ	0.36	0.48*	0.41	–		
PSS-10	0.07	0.32	0.50*	0.32	–	
BDI	0.31	0.58**	0.56*	0.46*	0.54*	–

TP: tender points; HAQ: Health Assessment Questionnaire; FIQ: Fibromyalgia Impact Questionnaire; PSS-10: Perceived Stress Scale; BDI: Beck Depression Inventory.
*P ≤ 0.05; **P ≤ 0.01.

DISCUSSION

The proportion of individuals with FM with depressive symptoms was significantly higher as compared with those of the CG (75% and 25%, respectively). In addition, the impact on quality of life was higher in the FM group (68.88 ± 15.04 *versus* 22.66 ± 14.05 on the CG). Recently, Aguglia et al.[30] have found similar results, reporting that 83.3% of the patients had depressive symptoms and worse quality of life. Studies carried out in Brazil have also found a high prevalence of depressive symptoms. Martinez et al.[31] have found that 80% of the patients with FM reported more depressive symptoms as compared with healthy individuals (12%). Berber et al.[13] have concluded that approximately two thirds of the patients studied had a depressive condition.

The results found in the present study differed from those by Santos et al.,[32] who have used the same instrument to assess depressive symptoms in patients with FM. While in this study the mean results (24.10 ± 11.68 for the FM group, and 10.20 ± 12.78 for the CG) indicate a depressive setting, those authors have indicated a dysphoric setting (17.75 ± 11.23 for patients, and 9.50 ± 6.44 for controls).

The depressive symptoms correlated with a higher number of the variables studied. That is, the higher the intensity of the depressive symptoms, the higher the pain severity, the difficulties in performing the daily chores, the perceived stress, and the negative impact on the quality of life. The relationship between the depressive symptoms and the impairment in the quality of life, mainly related to aspects of physical functionality and pain perception, has also been reported in a previous study carried out in Brazil.[13]

Some authors[2,33] have suggested that, due to the close relationship between certain symptoms of FM, mainly pain and psychiatric disorders, a pathophysiological overlapping for those processes might exist. Evidences indicate that certain brain areas involved in the generation of emotions are also involved in pain modulation. Thus, depression could amplify painful signs. In addition, depression is associated with changes in some neurotransmitters, which can reduce the modulatory effect of the pain inhibitory system.[34]

Individuals suffering from chronic pain and depression, including those with FM, have reduced functionality as compared with those without depression.[35]

In the present study, the impairment in performing daily chores differed between both groups, with the FM group showing moderate difficulty to severe disability. In addition, among the patients, the higher the pain severity reported, the greater the difficulty in performing daily activities. In fact,

pain accounts for generating a 40% variation in functionality, when assessed by using the HAQ.[36]

Not only pain intensity seems to influence that relationship, but also the number of TP, because a significant correlation was found between that number and the difficulty in performing daily functional activities (according to the HAQ).[37] However, in the present study, no relationship was found between the TP and any other variable assessed, contrary to other findings, in which the presence of the TP can reflect a measure of altered response to stress,[38,39] leaving areas of the body more sensitive.

The patients assessed had a higher perception of stress, confirming the findings of other authors, who have reported an important impact of that variable on FM and the severity of its symptoms.[40] Patients with FM have shown a greater perception of stress as compared with healthy controls,[41] and a greater perception of psychological stress as compared with patients with other chronic pain types.[35]

When investigating the relationship between pain and stress in patients with FM and healthy individuals, Ferreira et al.[42] have found no significant difference in the number of stressing events between both groups, attributing their result to the way patients cope with stress, and not only to the intensity of the events experienced. Differently, Becker et al.[43] have reported a relationship between high levels of stress and that syndrome, in addition to the existence of an interaction between the apolipoprotein E gene polymorphism and stress in FM.

In the present study, the stress perceived in the FM group showed no direct relationship to pain. This suggests that the degree patients perceive the life situations as stressing does not directly relate to the fact that they feel pain. However, stressful experiences have been associated with changes in pain threshold,[44] depending on the type of stress experienced (physical or emotional), as well as on its intensity and duration.[45]

The relationships between reduced functionality, stress, and depression found in the present study can indicate that the impairment in performing daily activities was a stress-generating factor for the FM group. Considering that the effects of negative chronic conditions seem to amplify the association between acute daily events and depression,[10] the relationship between functionality impairment and higher perception of stress can make patients with FM more susceptible to the appearance of depressive symptoms. Knowing the relationship between those variables and their intensity is important to elaborate adequate strategies for the treatment of FM.

CONCLUSIONS

Patients with FM have reduced functionality, greater perception of stress, and more severe depressive symptoms than healthy individuals.

Greater pain severity, reduced functionality, greater perception of stress, and greater impact on the quality of life showed a direct relationship with depressive symptoms in patients with FM. The impaired functionality in that group related to a greater perception of stress, but not to the quality of life. Stress showed no relationship to pain severity in patients with FM.

It is worth noting the relationship between stress, depression and functionality as part of a complex mechanism that can interfere with the quality of life of patients with FM.

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