Patients with fibromyalgia present different pain phenotypes compared to patients with generalized pain

Pacientes com fibromialgia apresentam fenótipos de dor diferentes em comparação com pacientes com dor generalizada

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ABSTRACT

BACKGROUND AND OBJECTIVES*:* Fibromyalgia and generalized pain represent a global health problem and are distinct musculoskeletal disorders, but there is an overlap in the clinical presentation between these conditions. However, no study has compared pain characteristics between patients with fibromyalgia and patients with generalized pain. Therefore, the present study aimed to compare pain characteristics and functional limitation of patients with fibromyalgia and patients with generalized pain.

METHODS*:* A pre-planned secondary analysis of data collected from 311 patients with musculoskeletal pain was performed. Pain characteristics included pain intensity, pain duration, pain area, symptoms of central sensitization, presence of neuropathic-like symptoms, and the conditioned pain modulation. The Patient-Specific Functional Scale assessed functional limitation.

RESULTS*:* 98 patients with generalized pain were identified, being 58 (59.18%) classified in the fibromyalgia group and 40 (40.82%) classified in the generalized pain group. Significant differences were found between groups for Widespread Pain Index, Symptom Severity Scale, and Polysymptomatic Distress Scale. Participants with fibromyalgia presented higher values of pain intensity (fibromyalgia = 7.29±2.07, generalized pain = 6.05±2.47; p=0.008), neuropathic-like symptoms (fibromyalgia = 17.74±7.62, generalized pain = 12.17±6.41; p=0.005), and symptoms of central sensitization (fibromyalgia = 51.32±14.26, generalized pain = 33.97±14.65; p<0.001), when compared with generalized pain. There was no significant difference in conditioned pain modulation and functional limitation between groups.

CONCLUSION*:* Patients with fibromyalgia exhibited unfavorable pain characteristics, including pain intensity, neuropathic-like symptoms, and symptoms of central sensitization compared to patients with generalized pain. However, pain duration, functional limitation, and conditioned pain modulation did not present meaningful differences between groups.

Keywords*:* Chronic pain, Fibromyalgia, Pain measurement, Pain threshold.

RESUMO

JUSTIFICATIVA E OBJETIVOS: Fibromialgia e dor generalizada representam um problema de saúde global e são distúrbios musculoesqueléticos distintos, mas há uma sobreposição na apresentação clínica entre essas condições. Entretanto, nenhum estudo comparou as características da dor entre os pacientes com estas condições. Portanto, o presente estudo teve como objetivo comparar as características da dor e a limitação funcional de pacientes com fibromialgia e dor generalizada.

MÉTODOS: Realizou-se uma análise secundária pré-planejada de dados coletados de 311 pacientes com dor musculoesquelética. As características da dor incluíram: intensidade da dor, duração da dor, área da dor, sintomas de sensibilização central, presença de sintomas neuropáticos e a modulação condicionada da dor. A escala de funcionalidade específica do paciente avaliou a limitação funcional.

RESULTADOS: Identificou-se 98 pacientes com dor generalizada, sendo 58 (59,18%) classificados no grupo de fibromialgia e 40 (40,82%) no grupo de dor generalizada. Diferenças significativas foram encontradas entre os grupos para *o* índice de dor generalizada, escala de severidade de sintomas e escala polissintomática de sofrimento. Os participantes com fibromialgia apresentaram maiores valores de intensidade da dor (fibromialgia = 7,29±2,07, dor generalizada = 6,05 ± 2,47; p=0,008), sintomas neuropáticos (fibromialgia = 17,74±7,62, dor generalizada = 12,17 ± 6,41; p=0,005) e sintomas de sensibilização central (fibromialgia = 51,32±14,26, dor generalizada = 33,97±14,65; p<0,001), quando comparados à dor generalizada. Não houve

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diferença significativa na modulação condicionada da dor e na limitação funcional entre os grupos.
CONCLUSÃO*:* Pacientes com fibromialgia exibiram características de dor desfavoráveis, incluindo intensidade de dor, sintomas neuropáticos e sintomas de sensibilização central, quando comparados a pacientes com dor generalizada. Entretanto, a duração da dor, a limitação funcional e a modulação condicionada da dor não apresentaram diferença significativa entre os grupos.
Descritores*:* Dor crônica, Dor musculoesquelética, Fibromialgia, Limiar da dor, Medição da dor.

INTRODUCTION

Fibromyalgia and generalized pain are prevailing in musculoskeletal health conditions. The prevalence of fibromyalgia was 4.7% in Europe[1], 6.4% in the United States[2], 4.4%[3] in Brazil and 2%-3% in the general population[4,5]. The prevalence of chronic widespread pain was 24% in Brazilian women[3], and 10.6%[6], or one in ten individuals, are affected by chronic widespread pain in the general population[6]. Patients with fibromyalgia present widespread musculoskeletal pain, fatigue, sleep disturbances, and cognitive changes[7,8]. Several instruments are available for the assessment of fibromyalgia and generalized pain. Preliminary criteria for the classification of fibromyalgia emerged in 1990[9]. In the last update, a combination of the Widespread Pain Index (WPI), which was designed initially to assess pain distribution[10], the Symptom Severity Scale (SSS), which evaluates cognitive and general somatic symptoms[11], and the combination of WPI and SSS that results in the Polysymptomatic Distress Scale (PSD), which measures the severity of fibromyalgia symptoms, have been recommended as diagnostic criteria[10].
Fibromyalgia and generalized pain are distinct musculoskeletal disorders, but there is an overlap of the clinical presentation between these conditions. Likewise, chronic widespread pain and multisite pain present similar symptoms of fibromyalgia[12]. A previous study claimed that fibromyalgia and chronic widespread pain differ more in quantitative than qualitative measures[13]. Patients with fibromyalgia and generalized pain had higher symptoms of pain, anxiety and depression than those with regional pain[14]. Fibromyalgia patients have more intense and persistent pain than patients with chronic widespread pain[13]. Moreover, fibromyalgia patients had more comorbidities, pain-related drugs, poorer health status, function and sleep, lower productivity, and higher costs compared to patients without chronic widespread pain and with chronic widespread pain but without fibromyalgia[15]. Generalized pain may be associated with fatigue, psychological distress, and concentration problems, like fibromyalgia[7,10]. Still, while the two conditions were similarly disabling[3], fibromyalgia has unfavorable clinical presentation when compared to chronic widespread pain[13,16]. However, the diagnosis of fibromyalgia and generalized pain remains troublesome, many redundancies exist[17] and it is unclear whether the addition of the cognitive and somatic symptoms adds meaningful value to the clinical phenotype of these patients. The identification of particular pain characteristics of these overlapping conditions may contribute to tailored treatment.
Fibromyalgia has distinct pain features when compared to other musculoskeletal conditions. A deficit of endogenous pain inhibitory systems is observed in fibromyalgia but not in chronic low back pain[18]. Patients with fibromyalgia also present higher levels of neuropathic-like symptoms compared to patients with rheumatoid arthritis[19]. Likewise, reduced pain threshold[13,20], increased temporal summation[21], decreased conditioned pain modulation (CPM)[21] and presence of central sensitization have been reported in patients with fibromyalgia[22]. However, no study has compared pain characteristics between patients with fibromyalgia and patients with generalized pain. Therefore, the present study aimed to compare pain characteristics and functional limitation of patients with fibromyalgia and patients with generalized pain. The hypothesis was that patients with fibromyalgia would report more severe symptoms, higher levels of functional limitation and impaired pain modulation in the cold pressor test than patients with generalized pain.

METHODS

A pre-planned secondary analysis of data collected from a previous study by the present group of authors was undertook[23]. The original study was a cross-sectional observational study that followed the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) criteria (Atachment 1)[24]. The study included 311 patients with musculoskeletal pain to compare the pain characteristics of patients with musculoskeletal pain classified according to PainDETECT as nociceptive pain, unclear and neuropathic-like symptoms. The current study excluded 213 patients with musculoskeletal pain without generalized pain and had a final sample of 98 patients with generalized pain. The original study was approved by the Research Ethics Committee of Federal Institute of Rio de Janeiro (number: 02228818.0.3001.5258), following the Helsinki Declaration for research in humans. All patients who met the eligibility criteria signed the informed consent form before the study procedures.

Study participants

Patients with musculoskeletal pain (aged 18 years and over) who sought treatment in the outpatient physiotherapy clinic of Gaffrée and Guinle University Hospital were enrolled between March and September 2019. The original study included patients with acute pain (pain duration less than three months) and chronic pain (pain duration greater than three months). Musculoskeletal pain was defined as pain perceived in a body region with muscular, ligament, bone, or joint origin[25]. The current study identified patients with generalized pain that could be classified as generalized pain or fibromyalgia according to the 2016 modified American College of Rheumatology (ACR) criteria. The study excluded patients who had a surgical procedure in the spine, pregnant women, patients with rheumatologic diagnosis in the acute inflammatory phase, with tumors, and patients who were illiterate or who could not complete the self-reported questionnaires.

Procedures

Patients were referred for an evaluation consisting of a clinical history and physical examination. Participants completed a

self-report questionnaire that included information on their sociodemographic characteristics (age, gender, weight, height, and body mass index), pain characteristics (pain intensity, pain duration, pain area, symptoms of central sensitization, presence of neuropathic-like symptoms, and CPM), functional limitation, and lifestyle factors (smoking, alcoholism, and physical activity). The completion of all questionnaires was supervised by one of the examiners for clarification, in case of uncertainties. The two examiners involved (J.V.B and M.C.B) had, respectively, two and 32 years of work experience in treating patients with musculoskeletal disorders. The clinical history assessment lasted approximately 10 minutes per participant. Next, patients were referred for evaluation of the efficiency of the CPM.

Patient classification

Fibromyalgia diagnosis was performed using the WPI and the SSS. WPI is a self-reported list of painful regions composed of 19 body areas, and the patient must mark the areas in which he or she felt pain during the last week. Each marked area is equivalent to 1 point. The final score varies between zero and 19 points. SSS is the sum of the severity scores of 3 symptoms (fatigue, waking unrefreshed, and cognitive symptoms) plus the totality of specific symptoms that occurred during the previous 6 months (headaches, pain or cramps in the lower abdomen, and depression). Fibromyalgia diagnosis was confirmed when WPI≥7 and SSS score≥5 or WPI of 4-6 and SSS score≥9, according to the 2016 modified American College of Rheumatology criteria[10]. Fibromyalgia severity was measured by the Polysymptomatic Distress Scale (PDS). The sum of the WPI obtains this scale (zero-19) and the SSS (zero-12) with a final score that varies between zero-31. According to the 2016 modified ACR criteria, a PDS score of at least 12 represents an approximate level of fibromyalgia diagnosis[10]. The psychometric assessment of WPI demonstrated good construct and criterion validity between young patients with painful conditions[26].

Generalized pain was defined when the participant reported pain in at least 4 of 5 regions (upper left and right, lower left and right, and axial) of the WPI. Jaw, chest, and abdominal pain are not included in generalized pain definition[10].

Main outcome measures

Pain intensity was assessed by the numeric pain rating scale (NPRS). The Central Sensitization Inventory (CSI) was used for evaluating symptoms associated with central sensitization. Neuropathic-like symptoms were assessed by the PainDETECT questionnaire[27]. Functional limitation was measured using the Patient-Specific Functional Scale[28] (PSFS). The cold pressor test assessed CPM. All questionnaires and tests were completed on the same day.

Pain characteristics

Pain intensity was measured during the initial evaluation using the NPRS from zero (no pain) to 10 (worst pain possible). Patients were oriented to rate their pain intensity now of the initial evaluation. The duration of pain was recorded in months, and patients were classified with chronic musculoskeletal pain if they had pain for more than three months[29]. Pain area was measured using the WPI. The sum of the WPI (0-19) and the SSS (0-12) results in the polysymptomatic distress (zero-31).

The CSI is an instrument developed to identify patients with symptoms associated with central sensitization[30]. Part A assesses 25 health-related symptoms commonly observed in patients with central sensitivity syndrome. Part A is scored on a 5-point Likert scale from 0 (never) to 4 (always), with a total of 100 points, and higher scores represent an increase in the severity of symptoms.

Part B is not scored and encompasses ten previous diagnoses of an individual, including seven central sensitivity syndromes and three disorders related to central sensitization syndrome. The optimal cut-off point was established at 40/100 in patients with central sensitivity syndrome[31,32]. The severity of symptoms related to central sensitization has been classified into sub-clinical (0–29), mild (30-39), moderate (40-49), severe (50-59) and extreme (60-100)[31,33], where higher scores indicate an increase in the severity of symptoms[34]. The Brazilian version of the CSI demonstrated strong psychometric properties[35].

PainDETECT is a self-administered questionnaire that encompasses four domains as follows: the intensity of pain (three questions), pain course pattern (four graphs), areas of pain and the presence of radiating pain (body chart drawing), and sensory descriptor items of pain (seven questions). For each question, six different answers are possible, with scores from zero (never) to five (very strongly). By summing up the scores given in each domain, a final score between -1 to 38 can be achieved. The PainDETECT is validated for many neuropathic pain conditions. In the last years, it was also validated for the use in mixed pain conditions such as rheumatoid arthritis, osteoarthritis, cancer pain, and lumbar spondylolisthesis. The cut-off points for the original questionnaire indicate that in the scores≤12 a neuropathic component is unlikely, whereas, in the ≥19 scores, a neuropathic component is probable[27,36]. The Brazilian version of PainDETECT is indicated as useful to identify neuropathic components in the pain of Brazilian patients[37].

Functional limitation

Functional limitation was investigated using the PSFS, which is a self-reported measure used to assess functional change in patients with musculoskeletal disorders. Patients should identify up to five important activities they are unable to perform or are restrict because of their pain and classify on an 11-point scale the current level of difficulty associated with each activity. PSFS has easy applicability and can be used clinically as an outcome measure[28,38].

Conditioned pain modulation

Cold pressor test is a psychophysical test used to assess the CPM, where the cold pain is the conditioning stimulus, and pressure

pain threshold (PPT) is the test stimulus. The cold pressor is an appropriate method to assess the descending nociceptive inhibitory system[39]. The conditioning stimulus was the immersion of the participants` hand in a bucket with temperature-controlled cold water (1ºC – 4ºC) monitored by a thermometer (5130 model, Incoterm™, Hong Kong, Sha Tin, China), for up to one minute. The participant was instructed to remain with the hand immersed in water without making muscle contractions or changes in position. The withdrawal of the side from the water was allowed when the patient could no longer tolerate the painful stimulus. Room temperature, humidity, lighting, and noise were maintained constant during the entire procedure.

PPT measurement was performed before and after one minute of the cold pressor test, using a digital pressure algometer (model Force Ten FDX, Wagner Instruments™, Greenwich, CT, USA). The distal part of the dorsal forearm and tibialis anterior muscle, which had not been immersed in water, were chosen to be evaluated due to the lack of relationship with participant's musculoskeletal complaints. The two sites were assessed in the same order for all participants. The operation of the pressure algometer and measurement of PPT were explained to patients before the assessment. In addition, a familiarization procedure was carried out with the pressure algometer by applying pressure to the dominant forearm to ensure that the test had been understood. The force was gradually increased (1 kilogram-force/s) until the feeling of pressure from the primary subject was changed to pain. PPT was recorded in kilograms-force (kgf) when the patient gave the verbal command "pain". The classification of the CPM efficiency was based on the following strategy: evidence of impaired pain modulation in two sites. Only patients with the inefficiency of the CPM in both locations (the anterior tibialis muscle and the distal part of the dorsal forearm) were classified as impaired pain modulation[40]. Upper and lower limb sites were used to avoid the inclusion of the patients with peripheral sensitization according to recommendations for CPM[40]. Also, the efficiency of the CPM was assessed by calculating the difference between PPT values in the cold pressor test (differences between final and initial value). Negative values represented an inefficiency of CPM and null or positive values were considered a typical response of CPM.

Statistical analysis

Demographic and clinical variables of the study population are presented as mean and standard deviation for continuous variables. Categorical variables are presented numerically and as a percentage of the sample. For continuous variables, the normal distribution of the outcomes of the study was verified by the Shapiro-Wilk test. The group of patients who presented fibromyalgia was compared with those with generalized pain. The comparison between groups according to the outcome's measures: the unpaired t-test performed pain intensity and pain duration due to the parametric distribution of the variables. The Chi-Square test was used to compare categorical variables: functional limitation, symptoms of central sensitization, neuropathic-like symptoms, and efficiency of the CPM. A significance level of less than 5% ($p<.05$) was considered for all analyses.

The statistical analysis was performed using JASP version 0.10.2.0. Given the lack of sample size calculation due to the secondary analysis, a post hoc power analysis was performed to determine whether the sample size was large enough for the findings to be statistically valid and to examine the potential for type II errors. The post hoc analysis was performed for estimation of the statistical power of the present study by unpaired t-test using G*Power 3.1.9.4 (Heinrich-Heine-Universität, Düsseldorf, Germany).

RESULTS

A total of 98 participants with generalized pain was identified. Among the included participants, 83 (84.69%) were women. The mean age was of 57.94±11.64 years old, and the mean body mass index was 27.91±6.65 kg/m^2. Forty-two (44.21%) participants reported practicing physical activities. All participants completed the questionnaires and the cold pressor test with no adverse events. Fifty-eight (59.18%) participants were classified with fibromyalgia and 40 (40.82%) participants were classified with generalized pain solely. Patients with fibromyalgia had higher number of pain areas in the WPI [fibromyalgia=11.39±3.52, generalized pain=8.67±3.35; p<0.001; power=0.96], more severe symptoms in the SSS [fibromyalgia=7.96±2.21, generalized pain=4.30±2.27; p<0.001; power =0.99], and in the PDS [fibromyalgia=16.75±5.29, generalized pain=12.97±3.75; p<0.001; power=0.98] than patients with generalized pain (Table 1).

A comparison of pain characteristics and functional limitation between patients classified with fibromyalgia and patients classified with generalized pain is presented in table 2. Participants with fibromyalgia presented higher values of pain intensity [fi-

Table 1. Characteristics of the study participants (n= 98)

Characteristics	Fibromyalgia n=58	Generalized pain n=40	p-value
Gender, n (%), female	52 (89.65%)	31 (77.50%)	0.102
Age, mean (SD)	58.94 (9.43)	56.46 (14.31)	0.305
Weight (kg), mean (SD)	72.59 (12.70)	73.07 (11.72)	0.855
Height (m), mean (SD)	1.61 (0.09)	1.59 (0.09)	0.323
Body mass index (kg/m²), mean (SD)	26.94 (7.30)	29.25 (5.45)	0.113
Physical activity (Yes), n (%)	27 (46.55%)	15 (37.50%)	0.453
WPI (0-19), mean (SD)	11.39 (3.52)	8.67 (3.35)	<0.001

Continue...

Table 1. Characteristics of the study participants (n= 98) – continuation

Characteristics	Fibromyalgia n=58	Generalized pain n=40	p-value
SSS (0-12), mean (SD)	7.96 (2.21)	4.30 (2.27)	<0.001
Headache (Yes), n (%)	47 (81.03%)	20 (50.00%)	0.008
Pain or cramps in lower abdomen (Yes), n (%)	25 (43.10%)	8 (20.00%)	0.017
Depression (Yes), n (%)	40 (68.96%)	8 (20.00%)	<0.001
Fatigue (0-3), mean (SD)	2.24 (0.94)	1.25 (0.96)	<0.001
Waking unrefreshed (0-3), mean (SD)	1.94 (1.16)	1.22 (1.20)	0.004
Cognitive symptoms (0-3), mean (SD)	1.84 (1.18)	0.90 (0.95)	<0.001
PDS (0-31), mean (SD)	19.36 (4.60)	12.97 (3.75)	<0.001

SD = standard deviation; WPI = Widespread Pain Index; SSS = Symptom Severity Scale; PDS = Polysymptomatic Distress Scale.

Note: The Student's t-test was used for continuous variables, and the Chi-Square test was used to compare categorical variables.

Table 2. Comparison of pain characteristics and functional limitation between patients with fibromyalgia and patients with generalized pain

Characteristics	Fibromyalgia n=58	Generalized pain n=40	p-value
Pain intensity, mean (SD)	7.29 (2.07)	6.05 (2.47)	0.008
Pain duration (months), mean (SD)	110.17 (116.35)	86.54 (98.54)	0.318
PainDETECT questionnaire, mean (SD)	17.74 (7.62)	12.17 (6.41)	0.005
Nociceptive pain (≤12), n (%)	13 (22.41%)	20 (51.28%)	0.003
Unlikely (13-18), n (%)	19 (32.75%)	12 (30.76%)	0.836
Neuropathic pain (≥19), n (%)	26 (44.82%)	7 (17.94%)	0.006
CSI, mean (SD)	51.32 (14.26)	33.97 (14.65)	<.001
Sub-clinical (0–29), n (%)	3 (5.17%)	18 (45.00%)	<.001
Mild (30–39), n (%)	11 (18.96%)	7 (17.50%)	0.855
Moderate (40–49), n (%)	15 (25.86%)	9 (22.50%)	0.705
Severe (50–59), n (%)	8 (13.79%)	4 (10.00%)	0.576
Extreme (60–100), n (%)	21 (36.20%)	2 (5.00%)	<.001
PSFS, mean (SD)	7.75 (2.04)	7.16 (1.91)	0.131
CPM (impaired), n (%)	14 (24.13%)	9 (22.50%)	0.851

SD = standard deviation; CSI = Central Sensitization Inventory; PSFS = Patient Specific Functional Scale;CPM = conditioned pain modulation.

Note: Student's t-test was used for continuous variables, and Chi-Square test was used to compare categorical variables.

bromyalgia=7.29±2.07, generalized pain=6.05±2.47; p=0.008; power=0.74], and pain duration [fibromyalgia=110.17±116.35, generalized pain=86.54±98.54; p=0.318; power=0.17]. Twenty-six (44.82%) participants of the fibromyalgia group and seven (17.94%) participants of the generalized pain group were classified with neuropathic-like symptoms. In the CSI, 44 (75.86%) participants with fibromyalgia and 15 (37.50%) participants of the generalized pain group had scores≥40. Diagnosis of depression was reported by 40 (68.96%) and 8 (20.00%) patients with fibromyalgia and generalized pain, respectively. There was no significant difference in CPM between groups [fibromyalgia=14 (24.13%), generalized pain=9 (22.50%); p=0.851; power=0.855] (Table 2).

DISCUSSION

The present findings confirmed the hypothesis and revealed that participants with fibromyalgia presented more severe symptomatology compared to generalized pain. Pain intensity, symptoms of neuropathic pain and central sensitization were more pronounced in participants with fibromyalgia than in participants with generalized pain. Recognizing that fibromyalgia and generalized pain are distinct musculoskeletal conditions highlights the need for specific treatment. The symptom severity scale has a notable role in the identification of these two conditions.

It is important to recognize the strengths and limitations of the present study. Firstly, to the best of the authors' knowledge, this is the first study that compared the clinical features of patients with fibromyalgia and patients with generalized pain. Second, the recent criteria defined by the ACR for the diagnosis of fibromyalgia and generalized pain was used[10]. Alternative approach to the diagnosis of fibromyalgia has been described despite the lack of measurement properties assessment[41]. Different diagnosis criteria could likely lead to additional findings. Third, the study design implemented many methods to minimize the risk of bias, following current guidelines for this type of study.

Regarding the limitations of the study, the main one is the relatively small number of participants included. Second, there is a lack of objective markers to diagnosis the two health conditions and other comorbidities. Moreover, chronic pain features may be reported dissimilarly using the questionnaire survey or interview survey method[42].

In comparison to patients with generalized pain, patients with fibromyalgia evidenced more impaired pain characteristics, corroborating previous studies[13,16,43]. In the same way, patients with fibromyalgia diagnosis or people whose symptoms met criteria for fibromyalgia had a greater symptom impact than people with chronic pain[44]. The present results showed that pain intensity was higher in patients with fibromyalgia compared to generalized pain. However, the findings revealed that pain duration showed no difference between the groups. On the other hand, patients with fibromyalgia in several studies have reported more intense and persistent pain than patients with chronic widespread pain[13,45-47].

The current study revealed that patients with fibromyalgia presented neuropathic-like symptoms measured by the PainDETECT questionnaire and higher levels of symptoms of central sensitization compared to patients with generalized pain. Likewise, other authors found neuropathic-like symptoms in 67% of patients with fibromyalgia using the PainDETECT questionnaire[19]. According to authors, abnormal wind-up and central sensitization have been reported in patients with fibromyalgia, which also relate to central pain processing abnormalities[22].

Interestingly, the level of functional limitation was similar between the patients with fibromyalgia and patients with generalized pain in the current study. There is evidence that patients with fibromyalgia and widespread pain were considered similarly disabling[3]. However, authors showed that participants with fibromyalgia had more pronounced pain-related interference in function and consequences for daily life compared to patients with chronic widespread pain[47]. The lack of difference in functional limitation between groups may be related to identical demographic and lifestyle features (gender, age, weight, height, body mass index and physical activity) of the participants. Furthermore, both groups had equivalent physical activity behavior. Individuals with chronic widespread pain with poor physical health and coping response to symptoms were identified as non-engagers of physical activity[48].

The present study's findings revealed that there are no significant differences in CPM between groups. Likewise, a previous study showed that patients with chronic widespread pain and fibromyalgia syndrome have equal CPM impairment[49]. On the other hand, a systematic review indicated that CPM seems to be dysfunctional in patients with chronic conditions, such as fibromyalgia[50]. It has been advocated that fibromyalgia syndrome is a condition that revealed clearly CPM impairment[18,51].

Authors showed that there was a deficit of endogenous pain inhibitory systems in fibromyalgia but not in chronic low back pain[18]. Similarly, a study showed that impairment in inhibitory pain modulation scores are likely antecedents to chronic widespread pain[52]. Although several studies observed the impairment in inhibitory pain modulation in participants with fibromyalgia and generalized pain, authors showed that results do not support the idea that a general deficiency of central inhibitory mechanisms is a result of fibromyalgia[53].

Future research in fibromyalgia and generalized pain must emphasize the use of the SSS as a clinical instrument for diagnosis that facilitates the distinction of these conditions. Although patients with fibromyalgia have generalized pain, clinicians must be aware that fibromyalgia and generalized pain are not the same conditions, and thus they may require specific treatments. The presence of more severe symptomatology in patients with fibromyalgia reveals a need for appropriate therapeutic interventions for an assertive treatment for these patients.

CONCLUSION

Patients classified in the fibromyalgia group exhibited higher levels of pain intensity, neuropathic-like symptoms, and symptoms of central sensitization compared to patients with generalized pain. Functional limitation and CPM demonstrated similar results between the two groups. Further studies should investigate the features of patients with fibromyalgia and generalized pain to facilitate the decision making of the clinicians.

AUTHORS' CONTRIBUTIONS

Juliana Valentim Bittencourt
Statistical analysis, Funding acquisition, Data Collection, Conceptualization, Resource Management, Project Management, Research, Methodology, Writing - Preparation of the original, Writing - Review and Editing, Software, Supervision, Validation, Visualization

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Atachment 1. STROBE Checklist of items that should be included in reports of cross-sectional studies

	Item nº	Recommendation	Page nº
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	01-02
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	01-03
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	03-04
Objectives	3	State specific objectives, including any prespecified hypotheses	05
Methods			
Study design	4	Present key elements of study design early in the paper	05
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	07
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	07
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	09-13
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	09-13
Bias	9	Describe any efforts to address potential sources of bias	-
Study size	10	Explain how the study size was arrived at	13
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	13
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	NA
		(b) Describe any methods used to examine subgroups and interactions	NA
		(c) Explain how missing data were addressed	NA
		(d) If applicable, describe analytical methods taking account of sampling strategy	NA
		(e) Describe any sensitivity analyses	NA
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	14
		(b) Give reasons for non-participation at each stage	NA
		(c) Consider use of a flow diagram	NA
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	14-16
		(b) Indicate number of participants with missing data for each variable of interest	14-16
Outcome data	15*	Report numbers of outcome events or summary measures	14-16
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	13
		(b) Report category boundaries when continuous variables were categorized	14-16
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	NA
Discussion			
Key results	18	Summarize key results with reference to study objectives	16
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	16-17
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	16-19
Generalizability	21	Discuss the generalizability (external validity) of the study results	16-19
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	19

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org. *Give information separately for exposed and unexposed groups.

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