Characterization of biopsychosocial factors of patients with chronic nonspecific low back pain

Caracterização de fatores biopsicossociais de pacientes com dor lombar crônica inespecífica

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ABSTRACT

BACKGROUND AND OBJECTIVES: Low back pain is considered a public health problem worldwide and has a personal, social, occupational and economic impact. Psychosocial signs such as inappropriate beliefs about pain, fear of movement, anxiety, stress, depression and low job satisfaction are characteristics of individuals with low back pain. These clinical signs are mediators of chronic pain and disability. The present study aimed to assess psychological comorbidities in patients with chronic non-specific low back pain who are undergoing physical therapy and patients awaiting physical therapy; in addition to characterizing the psychosocial profile of these individuals.

METHODS: This research was carried out with 31 individuals recruited from physical therapy clinics in the region of greater Florianópolis. They were divided into two groups: Treatment (TG) and non-treatment (CG). The following self-report instruments were applied: Hospital Anxiety and Depression Scale (HADS), Health Status Questionnaire (SF-36V2), Visual Analog Scale (VAS), Oswestry Low Back Pain Disability Index (OLBPDI), Fear-Avoidance Belief Questionnaire (FABQ) and Pain Castatrophizing Scale (PCS).

RESULTS: Significant differences (p<0.05) were observed in the scores of the instruments applied between the groups. The CG had higher averages than the GT.

CONCLUSION: The results obtained in this study support previous findings about the benefits of physical therapy for individuals with chronic nonspecific low back pain, suggesting that, in addition to reducing pain and disability, there are benefits related to psychosocial factors.

Keywords: Anxiety, Catastrophization, Physical therapy modalities, Low back pain, Quality of life.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A dor lombar é considerada um problema de saúde pública em todo o mundo e gera impacto pessoal, social, ocupacional e econômico. Os sinais psicossociais como crenças inapropriadas sobre a dor, medo do movimento, ansiedade, estresse, depressão e baixa satisfação no trabalho são características de indivíduos com lombalgia. Esses sinais clínicos são mediadores da dor crônica e incapacidade. O presente estudo teve como objetivo avaliar as comorbidades psicológicas em pacientes com dor lombar crônica inespecífica que estão em atendimento fisioterapêutico e pacientes que aguardam o atendimento de fisioterapia; além de caracterizar o perfil psicossocial desses indivíduos.

MÉTODOS: Este estudo foi realizado com 31 indivíduos, recrutados em clínicas de fisioterapia na região da grande Florianópolis. Foram divididos em dois grupos: tratamento (GT/n=16) e não tratamento (GC/n=15). Foram aplicados os seguintes instrumentos de autorrelato: *Hospital Anxiety and Depression Scale* (HADS), *Health Status Questionnaire* (SF-36V2), Escala Analógica Visual (EAV), *Oswestry Low Back Pain Disability Index* (OLBPDI), *Fear-Avoidance Belief Questionnaire* (FABQ) and *Pain Castatrophizing Scale* (PCS).

RESULTADOS: Foram observadas diferenças significativas (p<0,05) nos escores dos instrumentos aplicados entre os grupos. Sendo que o GC apresentou médias maiores que o GT.

CONCLUSÃO: Os resultados obtidos neste estudo apoiam descobertas anteriores sobre os benefícios da fisioterapia para indivíduos com dor lombar crônica inespecífica, sugerindo que, além da redução da dor e incapacidade, há benefícios relacionados aos fatores psicossociais.

Descritores: Ansiedade, Catastrofização, Dor lombar, Fisioterapia, Qualidade de vida.

INTRODUCTION

Non-specific low back pain (LBP) is a public health problem worldwide and generates personal, social, occupational and economic impact[1]. The estimation is that approximately 70 to 80% of all people will experience back pain at some point in their

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lives[2,3]. Furthermore, it has a high prevalence between 30 and 60 years of age, being considered one of the chronic conditions that is the main cause for disability and absence from work[3].

Regarding the causes of LBP, 90% don't have a defined origin, thus they are called nonspecific, and there may or may not be involvement of the lower limb (sciatic)[4,5]. This pain usually worsens with increased physical efforts or excessive load during a daily activity, decreases at rest and is usually aggravated by sedentarism and poor posture[4]. It can be classified according to the duration of symptoms as acute when the pain episode is less than 6 weeks, subacute when it lasts between 6 and 12 weeks, and chronic when it exceeds 3 months[6].

Although most cases of treated LBP are resolved in the acute type, a certain percentage of them develop disability and pain persistently[7]. For this reason, the investigation of psychosocial factors is necessary, since they influence pain coping mechanisms and, consequently, contribute to its chronification, to the development of disability, hinder adherence to physical activity programs, increase the fear related to movement, and change prognosis[8-10]. Evaluating these factors in clinical practice is essential for a good outcome in treatment and in improving aspects of life[11-13].

Integration of psychological factors in physiotherapeutic treatment can happen in several ways: by establishing goals; using techniques to distract attention from pain; using coping strategies through gradual exposure to movement and attenuation of the painful stimulus; encouraging self-efficacy and helping to change beliefs and attitudes towards pain[7,14,15].

Therefore, the present study's objective was to characterize the biopsychosocial profile of pain intensity, functional capacity, quality of life (QoL), catastrophizing, fear-avoidance and presence of anxiety and depression symptoms of patients with chronic nonspecific LBP in physical therapy care and compare it with individuals waiting for physical therapy.

METHODS

A cross-sectional study, carried out according to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines[16]. The research presents a descriptive and analytical approach on pain intensity, functional capacity, QoL, catastrophizing, fear-avoidance and presence of anxiety and depression symptoms in patients with chronic nonspecific LBP under treatment and without treatment.

Subjects who participated in the research were male and female, aged between 18 and 73 years old, with chronic LBP with non defined cause, who were or were not under treatment. The patients who were under physiotherapeutic treatment were recruited in physical therapy clinics in Florianópolis. Individuals awaiting treatment for LBP were recruited through the waiting list for physical therapy and contacted by telephone. Based on the sample size calculation, which predicts a 95% confidence level and a 20% sample loss, the total sample would have to contain at least 30 individuals[17].

The inclusion criteria were people with continuous recurrent LBP equal to or greater than 12 weeks, located between the costal margins and the lower gluteal folds, who revealed no physiological abnormalities during the clinical and imaging investigation. For the group under the physical therapy treatment, it was necessary that the patient had sought care for feeling continuous recurrent LBP longer than 12 weeks, and that they had been performing the therapy for at least 6 months uninterruptedly. Participants with postural abnormality, e.g., marked scoliosis, currently symptomatic fracture, history of back surgery, diagnosis of inflammation, joint disease, known severe osteoporosis, known metabolic or neuromuscular disease, and pregnant were excluded. The exclusion criteria were evaluated by means of the anamnesis and analysis of imaging examinations, such as computed tomography and nuclear magnetic resonance imaging.

The sample was divided into two groups: TG, composed of individuals with chronic nonspecific LBP who had been doing physical therapy for at least 6 months, and CG, composed of individuals with chronic nonspecific LBP who were waiting to be called for physical therapy care in the public service.

The data collected through interview and in a single session were age, gender, height (m), body mass (kg), and duration of symptoms (year). The following self-report instruments were applied: Hospital Anxiety and Depression Scale (HADS), Health Status Questionnaire (SF-36V2), Visual Analog Scale (VAS), Oswestry Low Back Pain Disability Index (OLBPDI), Fear-Avoidance Belief Questionnaire (FABQ) and Pain Castatrophizing Scale (PCS).

The HADS, validated for Brazil in 2008[18], was used to assess the presence of anxiety and depression symptoms. It's a self-assessment scale with 14 items, of which seven are for anxiety (HADS-A) and seven for depression (HADS-D) evaluation. Each of its items can be scored from zero to three, composing a maximum score of 21 points for each scale, and the recommended cut-off points for both subscales are: HAD-anxiety: no anxiety from zero to 8, presence of anxiety ≥9; HAD-depression: no depression from zero to 8, presence of depression ≥9[18].

The SF-36V2 was used to assess QoL. It consists of 36 items, encompassed in 8 domains: functional capacity, physical aspects, pain, general health status, vitality, social aspects, emotional aspects, and mental health. It presents a final score from zero to 100 obtained by calculating the Raw Scale, in which zero corresponds to the worst general condition of health and 100 corresponds to the best condition[19].

To assess pain, the 10-cm VAS was used, designating "no pain" on the left side and "worst pain" on the right side to measure the pain intensity at the moment[19].

The OLBPDI, validated in 2007 for the Brazilian Portuguese version[23], was used to evaluate the impact of LBP on functional activities. It has 10 items, each item can receive a value from zero to 5, with high values representing greater disability. The result represents the sum of all items and is expressed in percentage (0% to 100% score). The OLBPDI is classified into minimal disability (0-20%), moderate disability (21-40%), severe disability (41-60%), disabled patient (61-80%), and bed-ridden individual (81-100%)[20].

The 2008 Brazilian validated version of the FABQ[21] was used to assess the individual's fears and beliefs regarding work and physi-

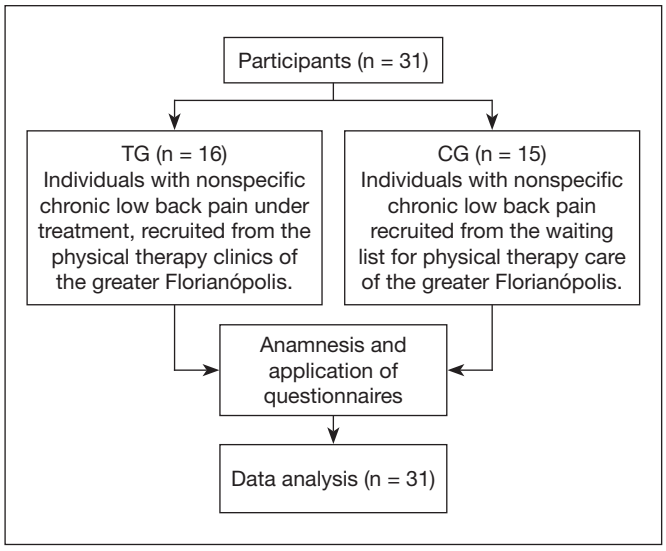

Figure 1. Data collection scheme
Source: Primary data (2020)

Table 1. Sociodemographic characteristics and anthropometric data of the participants involved in the study. Greater Florianópolis, 2019

		Groups	Mean ± SD	p-value* (Between the groups)
Gender	Male	TG	6 (37.5%)	-
		CG	6 (40%)	-
	Female	TG	10 (60%)	-
		CG	9 (62.5%)	-
Age (years)		TG	56.75±13.52	0.264
		CG	50.06±15.23	0.264
Weight (kg)		TG	72.31±12.64	0.583
		CG	74.8667±12.95	0.583
Height (m)		TG	1.65±0.10	0.749
		CG	1.64±.095	0.749
Time of pain (years)		TG	13.82±15.30	0.101
		CG	5.6429±3.93	0.101

TG = treatment group; CG = control group; Data expressed in mean ± standard deviation; *ANOVA one-way (p<0.05).

cal activities. It consists of 16 items, which are divided into two subscales: work (FABQ-W) and physical activities (FABQ-PA). Each item is graded on a seven-point scale, ranging from zero (strongly disagree) to 6 (strongly agree). The higher the score, the greater is the individual's belief regarding physical and/or functional activity, as well as the worsening of back pain[21].

The PCS, composed of 13 items and validated for Brazil in 2012, was used to identify catastrophizing thoughts or feelings regarding painful experiences. The total score ranges from zero to 52, with high scores indicating that more catastrophizing thoughts or feelings are experienced[22-24].

Data collection was performed after approval by the Ethics Committee on Research Involving Humans from Estácio de Santa Catarina University Center, with CAAE: 13937019.2.0000.5357. All subjects agreed to participate and signed the Free and Informed Consent Term (FICT).

Statistical analysis

The data were analyzed using the SPSS 20.0 software by analyzing the mean, median and standard deviation, and the Kolmogorov-Smirnov normality test was used for confirmation. After that, data were submitted to a descriptive analysis through absolute and percentage frequencies for categorical variables. To compare the results obtained in the different questionnaires, variance analysis was used, followed by the T-test for comparison of two independent groups. For decision criteria, a 5% significance level was adopted (p<0.05).

RESULTS

The sample for the present study consisted of 31 individuals. Of those, 16 were part of the TG (individuals in physical therapy) and 15 were part of the CG (individuals with LBP waiting for physical therapy) (Figure 1).

To assess the sample homogeneity, table 1 reveals the sociodemographic characteristics and anthropometric data of the subjects.

Table 2 presents the means and standard deviations of all domains and the global score of the questionnaires relative to the groups with chronic nonspecific LBP under treatment or not. The variance analysis showed significant differences between the

Table 2. Descriptive analysis of the questionnaires in relation to the study's groups. Greater Florianópolis, 2019

Questionnaires		Groups	n	Mean ± SD	p-value* (Between groups)
HADS	Anxiety	TG	16	6.50±3.46	0.021*
		CG	15	10.46±5.24	
	Depression	TG	16	4.56±2.63	0.009*
		CG	15	7.73±3.59	
	Total	TG	16	11.062±4.95	0.008*
		CG	15	18.20±8.29	
SF-36V2	General health condition	TG	16	8.7500±5.00	0.140
		CG	15	12.0667±5.84	
	Functional capacity	TG	16	66.87±21.43	0.024*
		CG	15	48.33±21.76	

Continue...

Table 2. Descriptive analysis of the questionnaires in relation to the study's groups. Greater Florianópolis, 2019 – continuation

Questionnaires		Groups	n	Mean ± SD	p-value* (Between groups)
SF-36V2	Social aspects	TG	16	16.68±20.47	0.922
		CG	15	18.53±2.42	
	Physical aspects limitations	TG	16	26.18±9.96	0.001*
		CG	15	14.33±9.68	
	Emotional aspects limitations	TG	16	32.93±9.95	0.027*
		CG	15	21.93±11.42	
	Pain	TG	16	55.75±20.19	0.002*
		CG	15	32.28±16.67	
	Vitality	TG	16	60.62±13.27	0.039*
		CG	15	50.0±14.01	
	Mental health	TG	16	66.25±18.06	0.033*
		CG	15	51.73±17.33	
	Total	TG	16	90.63±15.46	0.001*
		CG	15	82.13±16.36	
VAS		TG	16	3.81±2.56	0.008*
		CG	15	6.33±2.35	
OLBPDI		TG	16	16.31±8.45	0.001*
		CG	15	36.66±19.12	
FABQ	Physical Activity	TG	16	7.31±7.89	0.119
		CG	15	11.60±8.00	
	Work	TG	16	12.37±9.28	0.037*
		CG	15	22.60±14.20	
PCS		TG	16	13.37±14.65	0.009*
		CG	15	26.20±14.42	

HADS = Hospital Anxiety and Depression Scale; SF-36V2 = Health Status Questionnaire; VAS = Visual Analog Scale; OLBPDI = Oswestry Low Back Pain Disability Index; FABQ = Fear-Avoidance Belief Questionnaire; PCS = Pain Castatrophizing Scale; TG = treatment group; CG = control group; n = sample number; Data expressed in mean ± standard deviation; *ANOVA one- way (p<0,05).

groups means in most of the following assessment scores: anxiety and depression (HADS), quality of life (SF-36V2), pain (VAS), impact of LBP on functional activities (OLBPDI), fear-avoidance beliefs (FABQ) and discouragement associated with pain (PCS), with the CG group showing higher means than the TG group, with statistical significance confirmed through the T test (p<0.05).

DISCUSSION

The study presented the biopsychosocial profile of patients with nonspecific chronic LBP in physical therapy care and compared it to those awaiting physical therapy. Homogeneous characteristics between the groups were found, with a predominance of females. LBP is more prevalent in females between 40 and 80 years old, and the estimate is that the overall number of people who report LBP increases as the population ages[25].

The results suggest that the physical therapy treatment, besides helping to reduce pain, can reduce the disability caused by LBP, as in several studies[26-30]. The levels of pain found in the TG were mild to moderate (3.81±2.56), and were moderate to intense in the CG, according to the VAS classification (6.33±2.35). The OLBPDI found minimal disability for the TG (16.31±8.45) and moderate disability for the waiting group (36.66±19.12).

LBP causes a direct impact on individual QoL and consequently on physical perception and mental health. Improvement in QoL can interfere directly in improving disability and in psychological factors that interfere with pain intensity[31]. When QoL was assessed, the TG showed a statistically significant difference with the CG (TG 90.63±15.46; CG 82.13±16.36). When assessing anxiety and depression, the TG didn't present a mean score high enough to characterize anxiety (6.50±3.46) or depression (4.56±2.63), and the CG presented a mean score for anxiety (10.46±5.24) but not for depression (7.73±3.59).

In agreement with these findings, a double-blind randomized clinical trial[32] that sought to determine the effects of spinal stabilization exercises and manual therapy methods on levels of pain, function and QoL in individuals with chronic LBP also obtained positive results. One hundred and thirteen patients were included in the study, randomly divided into treatment and manual therapy groups, and evaluated before and after treatment. The VAS, OLBPDI and the SF-36 were used as assessment instruments. In the intragroup analyses, it was verified that after treatment both groups had effective results in the parameters of pain,

function and QoL (p<0.05), confirming that physical therapy in several forms can improve QoL, pain intensity and function.

The process of pain is made up of a sequence of cognitive events. It starts from the initial recognition of the noxious stimulus, goes through cognitive processing, followed by evaluation and interpretation of the stimulus, leading the individual to act or have a behavior of pain. This whole process is influenced and limited by personal beliefs, cultural values, and the environment. Factors such as excessive attention to pain (vigilance), exacerbated interpretation of the stimulus (catastrophizing), erroneous beliefs and attitudes toward pain, as well as expectations regarding pain relief can result in harmful bodily and cognitive behaviors. The patient who fears pain develops behaviors to avoid it, encouraging physical inactivity. With the lack of body movement, the association between the sensory and emotional components of pain is amplified, generating more fear and avoidance. These behaviors hinder recovery, make treatment more difficult, and increase the risk of development of persistent pain and disability[7,33,34].

Several studies highlight that psychosocial factor can be important prognostic elements and that measuring fear-avoidance is an important factor for therapeutic changes[31-37]. In a systematic review, authors[29] proposed the prognostic importance of fear-avoidance indexes through the FABQ and the Tampa Scale for Kinesiophobia on clinically relevant outcomes in patients with nonspecific LBP. The study found that these beliefs are predictors of poor treatment outcomes in subacute LBP and if considered early in treatment can reduce delays in recovery and avoid chronicity.

As for the assessment of fear avoidance (FABQ), the present study found low values for both groups in relation to the scale's own classification in the two domains: physical activity (FABQ-PA; TG = 7.31±7.89; CG = 11.60±8.00) and work (FABQ-W; TG = 12.37±9.28; CG = 22.60±14.20). For the rating of catastrophizing level, the treatment group did not rank as catastrophizers, unlike the TG (13.37±14.65); CG (26.20±14.42)[23]. When FABQ scores were compared between groups, lower scores for the TG compared to the CG were observed. In the domain of beliefs towards work (FABQ-W), a significant difference between groups was observed, however, in the domain of beliefs towards physical activities (FABQ-PA), this difference was not significant, and the present authors believe that it was due to the insufficient sample size.

Considering studies that evaluate treatments in order to modify beliefs and maladaptive behaviors, a research[38] evaluated 128 subjects with chronic LBP submitted to two treatments, their fear-avoidance (FABQ), catastrophizing (PCS), pain (Numeric Pain Rate Scale) and disability (Roland Morris Questionnaire) indexes. The patients were divided into two groups (n=64), one of which underwent traditional exercises (control group), and in the other, in addition to the exercises, an educational cognitive behavioral intervention was performed (experimental group). Both in the experimental group and in the control group, improvements in the scores of fear-avoidances (p=0.009) and catastrophizing (p=0.000) between the beginning of treatment and the end were observed. Both the pain and disability outcomes showed significant differences before and after (p=0.000), and the experimental group obtained significant improvement compared to the control group for the fear-avoidance and catastrophizing scores (p<0.001).

Data from another research corroborate the present study, a randomized clinical trial[39] evaluated 211 patients with non-specific LBP. Its objective was to verify if treatments based on different theories change pain catastrophizing and internal pain control, and if these factors could mediate the treatment outcome. Subjects were divided into 4 groups, one undergoing active physical treatment (n=52), one cognitive behavioral therapy (n=55), one a combination of physical exercise and cognitive behavioral therapy (n=55), and the last one was in a waiting list (n=49). Pain catastrophizing and internal pain control (Pain Cognition List), level of disability (Roland Morris Disability Questionnaire), pain (VAS), depression (Beck Depression Inventory) and patient-specific complaints were assessed.

Catastrophizing decreased significantly (p<0.05) in the three active therapies when compared to the waiting list, and treatments also showed significant reduction in disability, pain, and patient-specific complaints. Depression levels were reduced only in the physical activity group, and the regression coefficients suggest that catastrophizing mediates the reduction of disability, patient complaints, and pain. These findings support the fact that fear-avoidance is an independent variable and is relevant to treatment. Detecting this characteristic in patients who present acute or subacute LBP may be a useful tool to promote return to normal activities and avoid chronification.

Another study[40] compared the effect of 8 weeks of specific trunk exercises (SEG) and stationary cycling (CEG) on outcome measures of pain (VAS), disability (OLBPDI), catastrophizing beliefs (PCS) and fear-avoidance (FABQ) in 64 patients with nonspecific chronic LBP, with data being collected before treatment, at the end of 8 weeks and 6 months after. Patients were randomly assigned to the SEG or CEG treatment groups. At the end of 8 weeks there was improvement in all outcomes for both groups, with significant differences found in the SEG group for pain intensity (p<0.05), disability (p<0.05), catastrophizing (p<0.05) and fear avoidance in the physical activity domain (p<0.01) and in the CEG group for pain intensity (p<0.01) and catastrophizing (p<0.01).

The SEG group obtained significant reduction in pain and disability when compared to the CEG group immediately at the end of treatment. At the 6-month follow-up, the improvement from the beginning was significant in the SEG group for pain intensity (p<0.05), disability (p<0.05) and catastrophizing (p<0.001) and in the CEG group there was significant improvement in pain intensity (p<0.05), disability (p<0.01), beliefs of fear and physical activity avoidance (p<0.05) and catastrophizing (p<0.05). This change after six months of treatment in CEG meant that there was no significant difference between the groups. These findings support the present study's assertion that, regardless of intervention, physical therapy treatment is beneficial for patients with nonspecific chronic LBP in relation to functionality or psychosocial factors[41,42].

Early detection of psychosocial factors allows for an understanding of related circumstances, facilitates management, enables changes in therapeutic strategies, and speeds up the treatment

process. Simply changing erroneous beliefs related to fear-avoidance of pain can be explored and implemented in primary care, which would reduce costs[37]. Ignoring the presence of these factors or applying inadequate management can potentially lead to unnecessary suffering, restriction of daily life activities, loss of productivity, and waste of health care resources[42].

STUDY LIMITATIONS

The present study was cross-sectional, which may predispose a selection bias, and didn't investigate the physiotherapeutic intervention the patient was undergoing, not allowing comparisons between techniques and recommendations of specific approaches. For this reason, further studies comparing effects of different physical therapy interventions and describing benefits of treatment on psychosocial factors are suggested.

CONCLUSION

The present study's data support previous findings on the differences in the biopsychosocial characteristics present in individuals with nonspecific chronic LBP undergoing physical therapy and those waiting for treatment. In addition to improvement in pain and disability, there were significant differences in anxiety, depression, catastrophic thoughts, and fear-avoidance behavior in the group doing physical therapy treatment compared to the control group, inferring that physical therapy may bring benefits associated with psychological factors. Psychosocial factors are indeed associated with functional disability and pain intensity in these individuals, and these indexes together are determinant for QoL improvement. It's important to assess and incorporate psychosocial factors in therapeutic conducts because these aspects are described as mediators of chronicity and influence both the evolution and prognosis of treatment.

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