



Biopsychosocial factors and global perceived effect scale on the subject with chronic pain: an analytic cross-sectional study

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ABSTRACT

Background: Chronic pain is an emotional and sensorial experience that triggers functional incapacity guided especially by the biopsychosocial changes, that lead to its aggravation directly affecting the recovery of the patient. **Objective:** To verify the presence of biopsychosocial factors in the subject with chronic pain on the physiotherapeutic care undergone in a clinical physiotherapy school.

Method: A cross-sectional study, conducted in the physiotherapy clinic of the Health Sciences Center of the Universidade Estadual do Norte do Paraná, in which were evaluated 26 subjects with chronic pain through the Pain Numerical Rating Scale; Hospital Anxiety and Depression Scale; Pain Catastrophizing Scale; Fear Avoidance Beliefs Questionnaire; and Global Perceived Effect Scale. The statistical analysis had significance value of $P \leq 0.05$. **Results:** Even with reduction of pain intensity with $P = 0.04$, the values do not indicate clinically relevant difference. The global perceived effect scale does not indicate a significant improvement of the subjects; however this is justified because the treatment does not address biopsychosocial aspects, being a technical approach. **Conclusion:** The treatment of chronic pain associated with a biopsychosocial approach would be the most indicated in clinical practice.

Keywords: Chronic Pain; Biological Factors; Emotional Adjustment.

INTRODUCTION

Pain is defined as an impertinent emotional and sensorial experience that acts as a physiological function, indicating possible tissue damage. When there is a noxious stimulus the action of the peripheral nociceptors provoke motor reflexes in order to reduce and avoid complications to the organism⁽¹⁾. It is estimated that in the world the prevalence of chronic pain is on the mean of 35.5%, and 10% of the adult population is diagnosed with chronic pain annually⁽²⁾. The International Association for the Study of Pain (IASP) indicates similar values for the prevalence of subjects with chronic pain in Brazil⁽³⁾. Currently, chronic pain and disability are highly commented issues in the health area. When the pain exceeds the estimated time for healing, remaining for more than six months continuous and intermittent, it is considered chronic pain⁽⁴⁾. Numerous negative effects can occur in the subject's life due to pain, such as physical and functional disability resulting in limitations in activities of daily living (dressing, walking, sitting, picking up objects), changes in sleep, difficulty concentrating, fatigue and worries^(5,6). Disability may be a consequence of chronic pain, but not everybody develop it⁽⁴⁾, and relate to fear that usually refers to the feeling of concern in intensifying pain, anxiety that may favor the development of chronic pain, and disorders of cognitive function that compromise physiological

activities such as memory and perception⁽¹⁾. Chronic pain affects about 40% of the adult population, surpassing heart disease, cancer and diabetes. It is one of the main reasons why subjects seek assistance from health professionals and medication use, as well as an important reason for decreasing quality of life and productivity. The intensity of pain, catastrophization and disability can be pointed out as negative factors that influence the quality of life of subjects suffering from chronic pain. Chronic pain can be interpreted by the fear prevention model, in which physiological, behavioral and cognitive factors are responsible for the development and behavior of chronic pain. In this model, the subject has a fear of movement, and this can lead to limitation of activities of daily living and even disability⁽⁷⁾.

In the mid-1960's, chronic pain was seen only as medical issues, mainly as pathophysiological conditions that required only physical treatment such as surgeries or medications. Later, a biopsychosocial approach came to describe pain as an interaction between (a) biological factors such as intense physical work; (b) psychological disorders such as depression and catastrophization; and (c) social factors that may induce pain^(8,9). Depression, anxiety and distress, as well as negative thoughts and behaviors, are factors commonly found in

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subjects with chronic pain⁽⁸⁾. Although publicly experienced, chronic pain is a private event, being an experience that causes diverse impacts in the physical, social and psychological performance⁽¹⁰⁾. Therefore, the objective of this study was to verify the presence of biopsychosocial factors in a subject with chronic pain on the physiotherapeutic care undergone in a clinical physiotherapy school.

METHODS

An analytical cross-sectional study, approved by the Research Ethics Committee on Human Beings of the Universidade Estadual de Londrina with protocol number 2.117.093 according to resolution 466/12 of the National Health Council. The study included 26 subjects of both genders, aged between 18 and 75 years, who were undergoing treatment at the Universidade Estadual do Norte do Paraná (UENP) located in Jacarezinho (PR), Brazil. A free and informed consent form was presented to the volunteers. Inclusion criteria were subjects: a) aged between 18 and 75 years; b) being treated at the aforementioned clinic; c) who could read and write; d) with 24 points or more in Mini Mental. Exclusion criteria were: a) to present neurological changes; b) Diagnosis of learning deficit; c) be illiterate. Participants were given the informed consent form so that they were informed about the procedures and objectives of the study. They could at any time request their departure without penalty to them. Initially were applied: Mini-Mental State Examination (MMSE); Pain Numerical Rating Scale (PNRS); Hospital Anxiety and Depression Scale (HADS); Pain Catastrophizing Scale (PCS); Fear Avoidance Beliefs Questionnaire (FABQ); and subsequently performed 10 sessions of physiotherapeutic care, at the end the initial evaluation was repeated adding the Global Perceived Effect Scale (GPES).

The MMSE, developed in 1975, is an important cognitive impairment tool valid for the Brazilian population and has the capacity to evaluate cognitive functions such as temporal and spatial orientation, registration and recall of three words, attention and calculation, language and visual constructive capacity, being the maximum score of 30 points in which the subject presents better cognitive capacity⁽¹¹⁾. The instrument was used as eligibility criteria for volunteers. The PNRS presents a numerical sequence from 0 to 10, where they respectively represent "no pain" and "worst possible pain"⁽¹²⁾. The HADS⁽¹³⁾ validated and translated into the Brazilian Portuguese language, has the purpose of assisting the clinical recognition of the emotional component of the physical disease. HADS is divided into two subscales one called anxiety and the other depression, both have 7 questions that present 4 alternatives that can be scored from 0 to 3, allowing a final score in each subscale from 0 to 21⁽¹⁴⁾. There was a cutoff score of 8 points for anxiety and 9 points for depression⁽¹⁵⁾. The PCS, elaborated in 1995 and validated and translated into Brazilian Portuguese in 2012⁽¹⁶⁾, is a self-administered questionnaire

that presents 13 questions divided into 3 elements: helplessness, magnification and rumination. The scale is based on the 5-point Likert: 0 (not at all); 1 (to a slight degree); 2 (to a moderate degree); 3 (to a great degree); e 4 (all the time). The score for the helplessness element is given by questions 1 through 5 and 12; for magnification questions 6, 7 and 13; and for rumination questions 8 and 11. The PCS final score ranges from 0 to 52 points, with the psychological risk being directly proportional to the elevation of the score⁽¹⁷⁾. The FABQ is an instrument for the purpose of cognitive behavioral analysis referring to fear, beliefs and avoidance behaviors in subjects with chronic low back pain in relation to the physical activity and work. The present instrument was validated and translated into Brazilian Portuguese, consisting of 16 items of self-report and subdivided into FABQ-Phys addressing the beliefs related to occupational activities and the FABQ-Work beliefs related to work. Similar to the original version, items 1,8,13,14 and 16 were excluded from the sum of the final score, but continue to be part of the questionnaire. However, the score should be obtained in isolation from the subscales, in which the FABQ-Work was the sum of items 6,7,9,10-12 and 15 with score ranging from 0 to 42 and the FABQ-Phys was the sum of the items 2,3,4 and 5 with score ranging from 0 to 24 points⁽¹⁸⁾⁽¹⁹⁾. The GPES has the purpose of investigating musculoskeletal conditions, in which the patient has the capacity to report improvement or deterioration over time, usually used to measure the effect of a therapy, i.e., they were asked to quantify their current state of health scoring a scale from -5 (extremely worse) to +5 (completely recovered)⁽²⁰⁾.

The data were analyzed in the software Bioestat version 5.3, in which the descriptive analysis of the data occurred by means and standard deviations. Initially, the Shapiro-Wilk test was used to verify the normality of the data and later the T-test for the measurement of the studied variables. It was considered significant values which obtain $P \leq 0.05$.

RESULTS

As shown in table 1, the sample considered ($n = 26$) with a diagnosis of chronic pain had a mean age of 53.5 (11.1) years, being 69% female and 31% male. As for the time of pain, the mean reached was 10 years, in relation to the pain area 65% reported complaints in the spine, while 35% complained of pain in the lower limbs (hip, knee and ankle). The vast majority (69%) had professional occupations.

Table 2 shows the data of the initial and final evaluation, with a significant difference in pain reduction with $P = 0.04$, but not clinically relevant. There was a significant difference in the physical appearance of the FABQ with $P = 0.01$, in which the mean of the initial evaluation was 16.9 (7.5) points and the mean of the final evaluation was 21.5 (6.5) points, thus presenting a greater fear of movement during physical activity. Regarding the Global Perceived Effect Scale applied only in

**Table 1.** Characteristics of the sample.

Characteristic	Values
Sample (n)	26
Age (years)	53.5 (11.1)
Gender (%)	69% Female 31% Male
Time with pain (years)	10.0 (10.0)
Pain area	Spine 65% LL 35%
Occupation (%)	69% work 31% do not work

Note: LL: Lower Limbs.

Table 2. Initial and Final Evaluation.

Variable	Initial	Final	P
PNRS	6.3(2.0)	5.5(2.3)	0.04*
Anxiety	10.3(4.7)	10.1(4.4)	0.84
Depression	8.5(5.0)	9.3(4.1)	0.20
Helplessness	14.0(6.1)	13.9(5.1)	0.92
Magnification	8.0(3.2)	6.8(2.8)	0.06
Rumination	6.1(1.5)	5.7(1.3)	0.20
FABQ-Work	30.8(12.0)	31.0(11.5)	0.85
FABQ-Phys	16.9(7.5)	21.5(6.5)	0.01*
GPES		0.15(2.9)	

Note: PNRS: Pain Numerical Rating Scale; GPES: Global Perceived Effect Scale; P<0.05.

the final evaluation, measuring the patient's perception in relation to the therapy applied to it, an average of 0.15 (2.9) was observed, thus not presenting clinical relevance.

DISCUSSION

Catastrophic, anxiety, depressive feelings, negative thoughts and stress are evident to varying degrees in patients with chronic pain. These factors may also be consequences of pain, or contribute to the persistence of pain. It is extremely important to focus on biopsychosocial factors, considering non-variable aspects such as the personality of each subject⁽²¹⁾. One of the objectives of the present study was to verify the presence of biopsychosocial factors in subjects with chronic pain on the physiotherapeutic care undergone at a clinical physiotherapy school. The factors anxiety, depression, catastrophization (helplessness, magnification, rumination) and global perceived effect scale remained unchanged, with no significant differences. Significant difference was observed in pain reduction with $P = 0.04$ but not clinically relevant, being considered a reduction of approximately 2 points or 30% to represent a clinically considerable difference⁽²²⁾. The physical requirement evaluated by the FABQ, presented a significant

increase of the score in relation to the beliefs related to the occupational activities, however the work factor remained unchanged without significant differences. The volunteers did not obtain improvement of the anxiety and significant depression that remained with the same values and present in the reached scores, however with the reached scores the volunteers present anxiety 10.1 (4.4) and depression 9.3 (4.1). The values reached in relation to catastrophization (rumination, magnification and hopelessness) remained present and without clinical improvement, while in relation to the fear and avoidance of the respondents remained with similar fear to the movement during their work or occupational activity, as well as during the exercise after physiotherapy intervention, presenting greater fear and avoidance of movement caused by physical activity. The factors of global perceived effect scale did not indicate a significant improvement of the volunteers, however this is justified because the treatment does not address biopsychosocial aspects, being a technical approach.

A longitudinal observational study evaluated the efficacy of a multidisciplinary treatment for chronic generalized pain (the primary goal of the therapy was to teach the patient to deal with their pain and decrease the influence of pain on daily life), in which the patients presented post-treatment of 6 months lower levels of pain, anxiety and depression, as well as an improvement of the perception regarding the therapy applied to them. Subjects have also shown higher levels of education⁽²³⁾. A cross-sectional study carried out in 2016⁽²⁴⁾ analyzed the relationship between beliefs of fear and avoidance with pain and disability in subjects with chronic low back pain, no significant differences were found in FABQ scores before and after 6 months, thus indicating a strong relationship between high fear and avoidance with disability and pain. Corroborating with our results, a prospective observational study that obtained high scores on the FABQ-work score shows evidence that fear of activities complicate the recovery of chronic pain, thus indicating that prevention of pain may help professionals to define best treatment strategies. In addition, the high scores in the FABQ-work score suggest a worse response to conventional physiotherapy⁽²⁵⁾.

High levels of fear and avoidance are important predictors of chronic pain and failure to return to occupational activities. Some findings indicate that one of the methods of rehabilitation is reduction of fear and avoidance for positive outcomes⁽²⁶⁾. Perhaps the physical requirement had a significant difference because the evaluated subjects could be sedentary which, eventually, causes a certain limitation of the physical activities. In addition, kinesiotherapy, i.e., some exercises may have increased fear of pain. However, it is important to note that the questionnaires applied did not evaluate the level of physical activity performed by each individual, which could justify such outcome.

Many patients with chronic pain have an amplification of neural signaling within the central nervous system that causes a hypersensitivity to pain, i.e., the experience of pain in these



subjects ends up being much greater. This central sensitization is hardly noticed by the therapists, and the implementation of the treatment ends up being directed only to the management of pain, without taking into account other aspects such as emotional-cognitive (catastrophic, stress, lack of acceptance, depressive thoughts)⁽²⁷⁾. In addition, the treatment performed in the physiotherapy clinic does not cover biopsychosocial aspects, and since it is an subject with a diagnosis of chronic pain it is likely that only physical therapy is not significant in these circumstances. The physiotherapy treatment in general is technical (biomedical), i.e., aimed only at solving the physical problem⁽²⁸⁾. In this case there would be a need for a conventional therapeutic approach associated with biopsychosocial factors in clinical practice⁽²¹⁾. Reinforcing this statement, a systematic review study evaluated the efficacy of biopsychosocial rehabilitation with patients with chronic low back pain compared to usual care (physical treatment), in which they confirmed that individuals who received biopsychosocial rehabilitation were less likely to suffer from pain and disability⁽²⁹⁾. In another study, which evaluated the improvement in quality of life in women with chronic pain after applying a multidisciplinary program (biopsychosocial rehabilitation), compared to the control group, participants who received such intervention had a significant improvement in quality of life and quality of pain⁽³⁰⁾. These results reinforce the importance of the implementation of a physiotherapeutic treatment associated with biopsychosocial aspects in clinical practice.

As a limitation of the present study, the questionnaires applied did not evaluate the level of physical activity performed by each individual, which could justify such results. Another aspect to consider would be the evaluation of the degree of incapacity of these patients, since patients with chronic pain tend to a possible reduction of their activities of daily lives.

CONCLUSION

From this study, it can be conclude that even with reduction of pain intensity the values do not indicate clinically relevant difference. In relation to anxiety, depression and catastrophization, their values remained present and without significant changes. The factors of the global perceived effect scale do not indicate a significant improvement of the subjects, however this is justified because the treatment done does not address biopsychosocial aspects, being a technical approach. Regarding fear and avoidance, subjects presented significant differences in relation to physical activity. However, the treatment of chronic pain associated with a biopsychosocial approach would be the most indicated in clinical practice.

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AUTHORS' CONTRIBUTION

GCR: collection of information from the evaluations, manuscript design and article editing; TTDA: research guidance, data analysis and article editing; FJJ: research guidance; TCC: scales and questionnaires provision and research guidance.

CONFLICTS OF INTEREST

The authors declare that there was no conflict of interests.

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