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Original article

Prevalence of anxiety, depression and kinesiophobia in patients with low back pain and their association with the symptoms of low back spinal pain



Tathiana O. Trocoli*, Ricardo V. Botelho

Department of Neurosurgery, Hospital do Servidor Público Estadual de São Paulo (IAMSPE), São Paulo, SP, Brazil

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ABSTRACT

Objective: To evaluate the prevalence of anxiety, depression and kinesiophobia and their association with the symptoms of low back pain.

Methods: A total of 65 patients were divided into three groups: Organic, Amplified Organic and Non-Organic. They answered the Beck Anxiety Inventory, Beck Depression Inventory and Tampa Scale of Kinesiophobia and were evaluated according to their pain level using the Visual Analogic Scale.

Results: The average kinesiophobia scores of the patients in the Organic, Amplified Organic and Non-Organic groups were 36.26, 36.21 and 23.06 points, respectively. Patients who were classified into the Organic group experienced the most kinesiophobia out of all three groups ($p=0.007$). The average anxiety scores of the patients in the Organic, Amplified Organic and Non-Organic groups were 33.17, 32.79 and 32.81 points, respectively, with no significant difference among the groups ($p=0.99$). The average depression scores of the patients in the Organic, Amplified Organic and Non-Organic groups were 32.54, 28.79 and 37.69 points, respectively, with no significant difference among the groups ($p=0.29$).

Conclusion: There was no association between the groups and anxiety and depression. However, there was a positive correlation between kinesiophobia and the Organic group. Studies of other patient samples are needed to confirm the reproducibility and validity of these data in other populations.

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Prevalência de ansiedade, depressão e cinesiofobia em pacientes com lombalgia e sua associação com os sintomas da lombalgia

RESUMO

Objetivo: Avaliar a prevalência de ansiedade, depressão e cinesiofobia e sua associação com os sintomas da lombalgia.

Palavras-chave:

Ansiedade

Depressão

* Corresponding author.

E-mail: tathitrocoli@gmail.com (T.O. Trocoli).

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Cinesiofobia
Lombalgia
Transtornos somatoformes

Métodos: Foram divididos 65 pacientes em três grupos: orgânicos, orgânicos amplificados e não orgânicos. Eles responderam ao Inventário de Ansiedade de Beck, Inventário de Depressão de Beck e Escala de Cinesiofobia de Tampa e foram avaliados de acordo com seu nível de dor pela Escala Análogo-Numérica.

Resultados: Os escores médios de cinesiofobia dos pacientes dos grupos orgânicos, orgânicos amplificados e não orgânicos foram de 36,26, 36,21 e 23,06 pontos, respectivamente. Os pacientes que foram classificados no grupo orgânicos experimentaram maior cinesiofobia dentre os três grupos ($p=0,007$). Os escores médios de ansiedade dos pacientes dos grupos orgânicos, orgânicos amplificados e não orgânicos eram de 33,17, 32,79 e 32,81 pontos, respectivamente, não houve diferença significativa entre os grupos ($p=0,99$). Os escores médios de depressão dos pacientes dos grupos orgânicos, orgânicos amplificados e não orgânicos foram de 32,54, 28,79 e 37,69 pontos, respectivamente, não houve diferença significativa entre os grupos ($p=0,29$).

Conclusão: Não houve associação entre os grupos e a ansiedade e a depressão. No entanto, houve uma correlação positiva entre a cinesiofobia e o grupo orgânicos. São necessários estudos com outras amostras de pacientes para confirmar a reprodutibilidade e a validade desses dados em outras populações.

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Introduction

Low back pain is a frequent cause of physical limitations and absence from work and is associated with various somatoform disorders.¹⁻⁸ Studies have shown that the disability that is credited to the symptoms of low back pain presents a weak correlation with pain intensity.^{1-3,6,8,9} Many factors are associated with disability such as cognitive, affective, environmental and social factors and they may influence a patient's willingness to question the pain they experience^{2-4,6,8,10,11} and thus, a biopsychosocial approach could offer an alternative understanding of chronic pain and its impact on the ability of the patient to function.^{1-3,6,8,9}

The psychological profiles of patients with low back pain have been considered the most important prognostic indicator for the therapy of spinal disorders.¹ An awareness of the relationship of the disability to the pain intensity and to the patient's cognitive-behavioral profile may supply valuable information that may be used to predict the prognosis and the treatment and to help choose the best therapeutic approach.^{2,8} The manifestation of a patient's symptoms has often been considered a predictive tool for that patient's psychological profile.^{12,13} There are interest in the development of alternative methods to evaluate psychological distress without using specific psychological tools.

However, results in the literature are still conflicting as to whether indirect methods are able to evaluate psychological distress to the same extent as classical psychological instruments.¹⁴

In the study by Johansson et al.,⁵ which compared patients scheduled for either disc surgery or arthroscopic knee surgery, spine patients who were unable to work reported more dissatisfaction with their current work activity than patients awaiting arthroscopy who were also unable to work.

This suggests that patients with spinal conditions are more intensely affected by somatoform disorders than those with other injuries.⁵

Ransford¹⁴ showed there are a group of patients with high correlation between symptoms and image findings respecting the sensitive and motor radicular paths, and a group with scattered, amplified, migratory and non-anatomic pain without correlation with the image findings. However, clinical experience shows that we usually have a third group with a transition between those groups, with signs and symptoms explained by the images, but associated with amplified or exaggerated paths, out of the anatomic distribution.

Therefore, we classified the patient's symptoms as representative of an organic disease (Organic – ORG), of organic disease with behavioral-cognitive expansion (Amplified Organic – AO), or as a representative of psychosomatic manifestations (Non-Organic – NO) and correlated with the levels of anxiety, depression and kinesiphobia in each of these symptoms groups.

The objective of this study was to evaluate the prevalence of anxiety, depression and kinesiphobia in patients with low back pain in three groups of spine symptoms, divided into Organic, Amplified Organic and Non-Organic.

Methodology

This was a cross-sectional study of all consecutive patients who attended the outpatient clinic of spinal diseases from May to December 2013. Patients who were invited to participate were 18–80 years of age. All of the participants were informed about the study objectives, and those who agreed to take part signed the Informed Consent Form. Patients who had previously undergone surgery on their spine, and those with pain that originated from trauma or cancer were excluded from this study. Age, gender and education level were also evaluated. Education level was classified as elementary, secondary or higher. Pain was measured with the numeric Visual Analog Scale and was documented by pain drawings. Pain was classified as either severe (between 8 and 10 points), moderate (between 4 and 7) or mild (between 0 and 3 points). The length

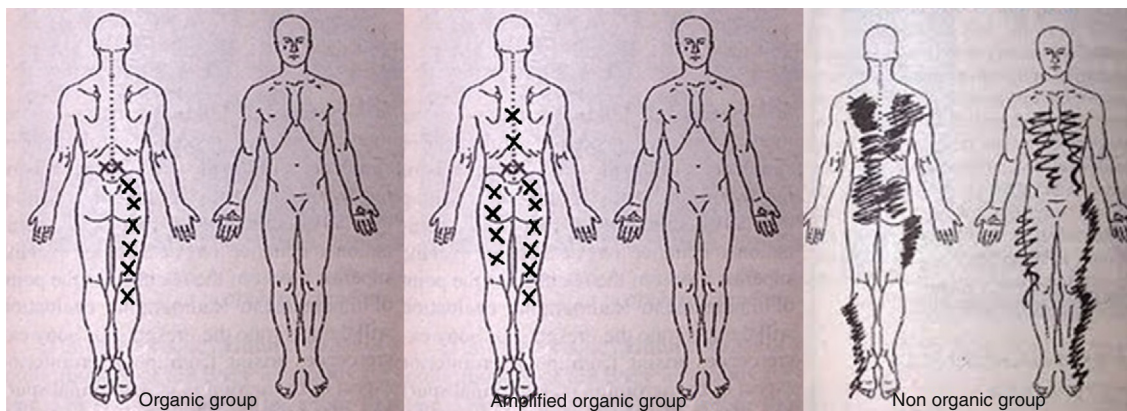


Fig. 1 – Representation of patients symptoms according to the groups.

of time during which the symptoms were experienced was measured in months starting from the onset of the symptoms.

Classification of the symptoms

Ransford et al.¹⁴ demonstrated that for patients with low back pain, an abnormal way of depicting their symptoms on a silhouette of the human body is associated with elevated scores on other psychosomatic scales.¹⁴ Based on the evaluation of the pain drawings, anamnesis and a physical evaluation performed by the patient's doctor, patients were classified as Organic, Amplified Organic and Non-Organic.

Organic group (ORG): patients who showed a high correlation between symptoms and image findings. The symptoms of this group suggest a radicular component without amplifications, respecting the sensitive and motor paths.

Amplified Organic group (AO): patients with signs and symptoms explained by the images, but associated with amplified or exaggerated paths, out of the anatomic distribution.

Non-Organic group (NO): those patients who had scattered, amplified, migratory and non-anatomic pain, without correlation with the image findings.

An example of the pain drawings from each specific group can be found in Fig. 1.

Anxiety, depression and kinesiophobia assessment: to measure anxious and depressive behaviors, the Beck Anxiety Inventory¹⁵ and the Beck Depression Inventory¹⁶ were used. In addition, the Brazilian version of the Tampa Scale of Kinesiophobia¹⁰ was used to assess kinesiophobia. This scale consists of a self-administered questionnaire composed of 17 questions that addresses the pain and intensity of symptoms. Scores range from one to four points, and the answer "strongly disagree" is equivalent to one point, "partially disagree" to two points, "partially agree" to three points, and "strongly agree" to four points. To obtain the final total score is required inversion of scores for the questions 4, 8 12 and 16. The final score may be at least 17 points and maximum 68 points, and the higher the score the most kinesiophobia the patient presents. Assessed kinesiophobia was classified as mild (17–34 points), moderate (35–50 points) or severe (51–68 points). Assessed anxiety was classified as mild (0–15 points), moderate (16–25 points)

or severe (26–63 points). Assessed depression was classified as mild (0–18 points), moderate (19–29 points) or severe (30–62 points).

This study was approved by the institutional Research Ethics Committee under protocol number 283.083/2013.

Statistical analysis

The demographic and anthropometric characteristics were described by descriptive statistics with mean and standard deviation. The normality of the distribution of the variables was performed using Kolmogorov-Smirnov test.

Mean of variables with nonparametric distributions and their scores were evaluated by Kruskal-Wallis analysis of variance.

Results

A total of 80 patients were invited to participate in the study and 15 did not agree to take part.

Fig. 2 is a chart that demonstrates the results of this study.

Results for this group of patients

Eighteen patients were male, and 47 were female. The age range of the participants was 26–77, and the average age was 55 years. The average pain intensity for the whole group of patients was 7.7 points on the Visual Analog Scale: 76.9% experienced severe pain (8–10 points), 20% experienced moderate pain intensity (4–7 points), and 3.1% experienced mild pain intensity (0–3 points). With regards to the education level of the patients, 12 patients had only elementary school education (18.4%), 26 had a secondary school education (40%), and 27 had attained a level higher (41.6%). The average of the depression scores for the whole group was 17 points. In all, 66.2% of patients experienced mild depression, while 20% and 13.8% experienced moderate and severe depression, respectively. The average of the anxiety scores among all patients was 22.9 points. A total of 41.5% of patients experienced mild anxiety, whereas 24.6% and 33.9% experienced moderate and severe anxiety, respectively. The average of the kinesiophobia

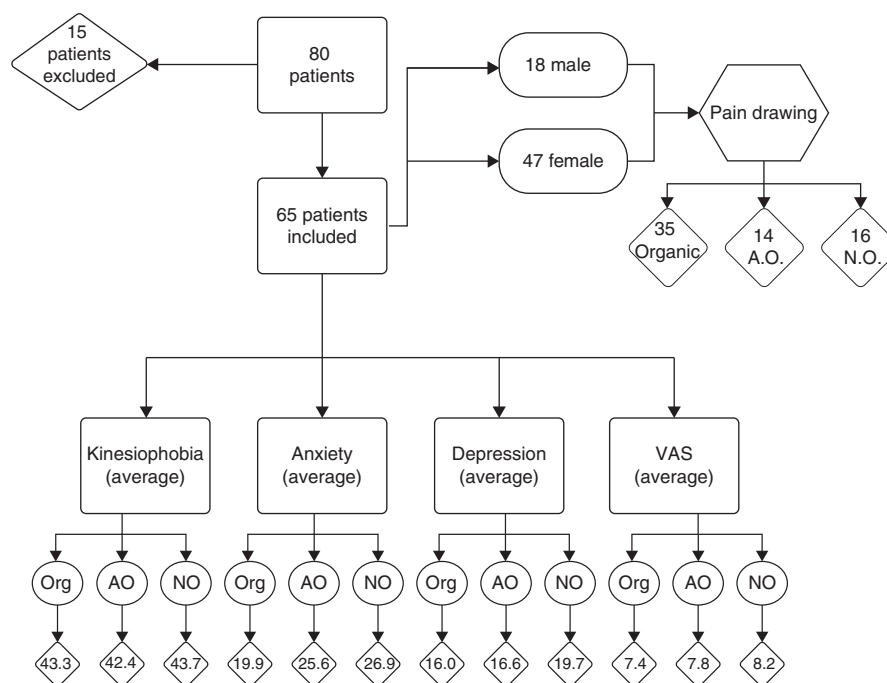


Fig. 2 – Flowchart of patients included and excluded with the distribution in each group and the scores of anxiety, depression, kinesiophobia and Visual Analogic Scale.

scores among all patients was 43.3 points, with 16.9% of cases classified as mild, 56.9% as moderate and 26.2% as severe.

Classification of patients by type of pain behavior

Concerning the symptoms, 35 patients were placed into the Organic group, 14 into the Amplified Organic group and 16 patients were placed into the Non-Organic symptom group (Fig. 3). There was no difference between the average ages of the three groups (one-way ANOVA: $F = 0.583$; $p = 0.561$). The average level of pain measured was 7.37 in the Organic group, 7.85 in the Amplified Organic group and 8.31 in the Non-Organic group (Kruskal-Wallis; $p = 0.20$). The average length of time of the patients' symptoms was 40.6 months (range: 4–144 months). There was no significant difference between the subgroups (Kruskal-Wallis; $p = 0.39$).

The educational levels and the manifestation of the three types of symptoms: out of those who only had elementary

education, five participants were classified into the Organic group, two into the Amplified Organic group and five into the Non-Organic group. Out of the individuals who had a secondary education, 14 patients were classified into the Organic group, six into the Amplified Organic group and six into the Non-Organic group. Out of those who had higher education levels, 16 patients were classified into the Organic group, six into the Amplified Organic group and five into the Non-Organic group ($p < 0.01$).

Psychosomatic scores in the different symptom subgroups

Kinesiophobia: the average scores of the patients in the Organic, Amplified Organic and Non-Organic groups were 43.6, 42.4 and 43.68 points, respectively. Patients who were classified into the Organic group experienced the most kinesiophobia out of all three groups ($p = 0.007$).

Anxiety: the average anxiety scores of the patients in the Organic, Amplified Organic and Non-Organic groups were 19.9, 25.6 and 26.9 points, respectively. There was no significant difference among the groups ($p = 0.99$).

Depression: the average depression scores of the patients in the Organic, Amplified Organic and Non-Organic groups were 16, 16.6 and 19.7 points, respectively. There was no significant difference among the groups ($p = 0.29$).

The kinesiophobia, anxiety and depression scores are shown in Fig. 4 and Table 1.

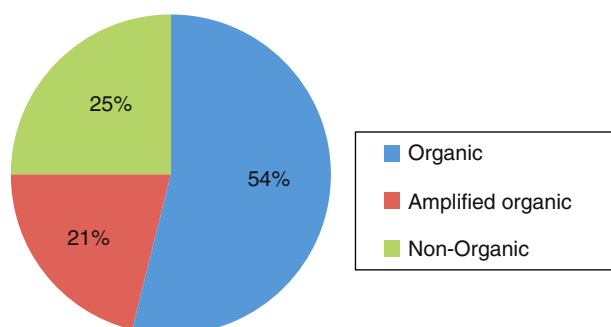


Fig. 3 – Distribution of patients in each of the three subgroups: organic, organic amplified and non-organic.

Discussion

Disabilities that are associated with conditions of the lower back may be the result of a combination of psychosocial

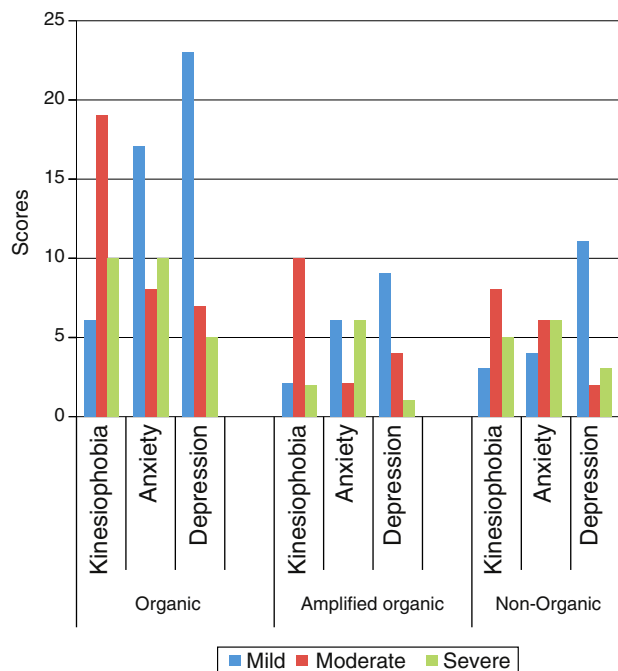


Fig. 4 – Scores of kinesiophobia, anxiety and depression in each of the symptom groups classified as mild, moderate and severe.

factors and alterations in bodily functions according to the ICF (International Classification of Functioning, Disability and Health).¹ Anxiety and depression often coexist in patients with chronic pain,^{17,18} and hinder their ability to work, as well as to function both socially and physically. This also complicates the ability of patients to control their pain and thus also affects the quality of life of individuals with degenerative diseases of the lower back.¹⁹

The Beck Anxiety¹⁵ and Depression¹⁶ Inventories are widely used tools in the classification of anxious and depressive behaviors of patients in outpatient clinical care settings. The Tampa Scale of Kinesiophobia has been used as a powerful selector of patients with poor psychological profiles and, therefore, those with a poor prognosis for therapy.^{3,10}

There are theories that have attempted to explain the origin of chronic lower back pain. A commonly used model for understanding chronic lower back pain is based on the proportionality of the pain in relation to the extent of the tissue injury.^{1-4,8,20} However, there is evidence that the persistence of pain may not only be explained by objective clinical findings,^{1-4,8,20} and some authors have found a weak association between pain intensity and the disability of the patient.¹⁰

Table 1 – Distribution of patients by the groups and the average scores of kinesiophobia, anxiety and depression in each group.

	n	Kinesiophobia	Anxiety	Depression
Organic	35	43.3	19.9	16.0
Amplified organic	14	42.4	25.6	16.0
Non-organic	16	43.7	26.9	19.7

Some research suggests that a patient's psychological profile is the most important predictor of prognosis after spine therapy.¹ The study by Bair et al.¹⁹ has illustrated that a combination of chronic musculoskeletal pain and psychosomatic factors (anxiety and depression) is associated with more severe pain and a greater interference with daily activities, when they are compared with patients who experience pain exclusively.

In addition, the link between chronic pain and its affective components is well known. In a representative sample, McWilliams et al.²¹ found that anxiety was present in 35% of people with chronic pain compared to 18% of the general population.¹⁹ Depression rates in the general population are also approximately 18%, whereas among patients with chronic pain, the depression rate may be as high as 58%.²²

To classify the patients' symptoms, the evaluator considered the patients that demonstrate a high correlation between symptoms and image findings as part of the Organic group; within the Amplified Organic group, the symptoms are relatively amplified to the underlying condition; within the Non-Organic group, there is little correlation between symptoms and clinical findings.¹⁴

In theory, patients with an inadequate psychological profile, with somatoform amplifications, anxiety and depression, would tend to present with symptoms within the Non-Organic or Amplified Organic groups. Patients with spinal conditions who have adequate psychological profiles without somatoform disorders would tend to present with symptoms within the Organic group. Thus, we tested this association.

However, we found no significant differences in the distribution of somatoform disorders, except in relation to kinesiophobia, for which there was a significant difference in the Organic group compared to the other groups. We believe this happened because anxiety and depression in majority of the patients with spine or spine suggested symptoms are very prevalent and kinesiophobia represents an illness behavior more associated to organic spine disease. In this sense, kinesiophobia could be a protective mechanism of locomotor system.

The study of Siqueira et al.¹⁰ showed that individuals with high scores in the Tampa Scale of Kinesiophobia perform worse on physical tests, which supports the premise that patients with a well-defined organic injury may present a fear of performing movements that are known to cause more pain.

The kinesiophobia model suggests that patients fear movements because of pain, to avoid worsening their condition or avoid causing a new problem. This fear leads to two responses: the patient may confront or avoid the activity. During confrontation, the individual performs a movement, which gradually reduces their fear of that movement. In avoidance, the individual does not perform the movement and becomes increasingly less active, which results in a vicious cycle that leads to physical disability.²³

As a confirmation of this model, a study on patients with chronic low back pain found that those with the highest level of kinesiophobia had a 41% higher risk of developing a physical disability.²⁴

Picovet et al.²⁵ found that kinesiophobia predicts pain and disability in patients with chronic low back pain. Siqueira et al.¹⁰ showed that high scores on the Tampa Scale of

Kinesiophobia are valuable in that they can predict the level of an individual's disability compared with clinical signs and symptoms, intensity and duration of pain and anxiety.

This study was initially designed to evaluate 30 patients in each group to fit to a normal distribution of prevalences among the groups. However, after each evaluation of data, the extent to which the sample grew in subsequent analysis, more robust the trend to identify differences in organic group was revealed. The authors decided to evaluate this number of patients due to the stability of results.

The average length of time that patients experienced symptoms of pain in this study was a little over three years, which may be an aggravating factor for somatoform disorders, as shown by van der Windt et al.²⁶ They found that patients with lower back pain have a greater tendency to develop chronic back pain and to catastrophize it, compared with patients with shoulder injuries (characterized by acute pain with an injury that is often well located).

Identifying individuals with a good or a poor prognosis is the goal of most of the research on the treatment of any spinal disease. The ability to predict the prognosis during an initial evaluation may lead to more realistic expectations of recovery as well as the use of more efficient treatments to prevent or combat chronic pain.^{3,10,25} The study by Helmhout et al.³ exemplifies this importance when they demonstrated that the decisive prognostic factor was disability followed by a fear or movement as assessed by the Tampa Scale of Kinesiophobia.

Although our results did not reveal significant differences in terms of the prevalence of anxiety and depression in any particular symptom group, these conditions were highly prevalent and were not associated with any single type of pain behavior in all three groups studied; however, patients with higher kinesiophobia scores were more likely to present with organic symptoms. We deliberately did not evaluate the preexistence of psychiatric conditions in any of the patients studied. One intuitive previous hypothesis was that our questionnaires would identify differences among the three selected groups. In fact, anxiety and depression were very prevalent in all groups.

This study reinforces the data that patients with lumbar spine signs and symptoms have a high prevalence of anxiety and depression and, any professional who treats those patients should take it in considerations. Kinesiophobia should be related to a more organic patients in selection of treatments.

Limitations of this study: further studies with larger sample and multicenter studies are needed to verify whether these patients show a difference in prognosis according to the type of treatment they received.

Our results were obtained from a sample of patients who are civil servants of the state of São Paulo (Brazil). We cannot assure extrapolation (external validity) of these data for different populations.

Conclusion

There was no association between the symptoms of anxiety and depression. However, patients who were classified in the Organic group were more likely to experience kinesiophobia.

Studies of other patient samples are needed to confirm the reproducibility and validity of these data in other populations.

Conflicts of interest

The authors declare no conflicts of interest.

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