



Efficacy of the Santhiflex™ method of psychomotor postural re-education in the treatment of chronic low back pain

Eficácia do método Santhiflex® de reeducação postural psicomotora (RPP) no tratamento da lombalgia crônica

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Abstract

Introduction: Chronic low back pain is conceived of as a multifactorial syndrome that results in the loss of functional capacity. It affects the quality of life of an individual and its treatment requires a comprehensive therapeutic approach. **Objective:** The aim of this study is to assess the efficacy of the Santhiflex™ Method in the treatment of chronic low back pain, as well as its effects on functional capacity, health-related quality of life and body posture. **Materials and methods:** 20 patients with chronic low back pain were randomly distributed into two groups of 10: an experimental group, which was treated with the Santhiflex™ Method of psychomotor postural re-education; and a control group, which was given a lecture on postural orientation after the first evaluation. **Results:** The obtained data were analyzed using standard statistical software, SPSS-17 for Windows (SPSS, Chicago, IL, USA) and the results were expressed as absolute and relative frequencies, and median with first and third quartiles. The nonparametric Wilcoxon test was used for within-group samples. Intergroup comparison was performed using the Mann-Whitney test. A value of $p < 0.05$ was considered statistically significant. There were significant differences in the main factors assessed. **Discussion:** The findings demonstrated a significant total improvement in low back pain scores in the EG,

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whereas there was no significant change in the CG. **Conclusion:** The Santhiflex™ Method is effective in the treatment of low back pain and has positive effects on functional capacity and health-related quality of life.

Keywords: Low back pain. Posture. Psychosomatic disorders. Therapeutic methods.

Resumo

Introdução: A dor lombar crônica como síndrome multifatorial resulta na perda da capacidade funcional com repercussão na qualidade de vida, sendo necessária uma abordagem terapêutica integral. **Objetivo:** Verificar a eficácia do método Santhiflex® no tratamento da dor lombar crônica e de sua repercussão na capacidade funcional, na qualidade de vida e na postura corporal. **Materiais e métodos:** 20 pacientes portadores de lombalgia crônica foram distribuídos aleatoriamente em dois grupos de 10 indivíduos cada: o grupo experimental, que foi submetido ao tratamento com o Método Santhiflex® de reeducação postural psicomotora, e o grupo controle, que recebeu uma aula de orientação postural após a primeira avaliação. **Resultados:** Os dados obtidos foram trabalhados no programa estatístico SPSS 17, sendo verificados a frequência absoluta e relativa, o valor mediana, o primeiro e o terceiro quartis. Foi utilizado o teste não paramétrico de Wilcoxon para amostras intragrupo e realizada a comparação intergrupo por meio do teste de Mann-Whitney, estabelecido o valor de $p \leq 0,05$. Foram encontradas diferenças significativas entre os principais fatores avaliados. **Discussão:** Os dados demonstram que houve melhora de significância total do nível de dor lombar no GE; já no GC, o nível de dor não sofreu alteração significativa. **Conclusão:** O método Santhiflex® é eficaz no tratamento da dor lombar e em suas repercussões na capacidade funcional e na qualidade de vida, avaliadas neste estudo.

Palavras-chave: Dor lombar. Postura. Transtornos psicossomáticos. Métodos terapêuticos.

Introduction

Low back pain is the pain in the low back area while lumbosciatalgia is low back pain radiating to the lower limbs due to sciatic nerve compression. When low back pain persists for at least 3 months, it is considered chronic and its symptoms may affect several dimensions of a person's life.

Studies show that low back pain is present in 70-80% of the population at some time in their lives. Annual prevalence among adults is approximately 15-45% (1). In Brazil, it has been estimated that more than 10 million individuals suffer from disability caused by low back pain (2). Functional incapacity, according to Rosa et al. (3), is the presence of difficulties in performing certain gestures and activities of daily living, or even the inability to perform them.

The way in which chronic pain affects an individual's functional capacity can be explained through the neuropathophysiology of low back pain. According to Stump (4), the mechanisms of low back pain occur due to peripheral and central neural sensitization, after constant nociceptive stimulation, which results in primary and secondary hyperalgesias. In the

peripheral system, nociceptors of the injured area are stimulated by substances such as histamine, adrenaline, cytokines and prostaglandins, leading to spontaneous pain sensations that may be aggravated by any other stimulus. This process is known as primary hyperalgesia. In secondary hyperalgesia or central sensitization, there is the development of spinal cord hyperexcitability in response to nociceptive impulses from somatic or visceral structures that reach the convergent neuron. This is one of the mechanisms that explain *referred pain*.

If pain transforms to a chronic state, it loses its protective role. It induces changes in neural plasticity and becomes a clinical syndrome, which can affect the functional capacity and health-related quality of life of individuals. However, when spinal cord nociception reaches the cortex, it may or may not be interpreted as pain, depending on the number of interferences suffered along its "journey". One of the causes for this is the convergent neuron, which also receives non-nociceptive impulses from other ascending or descending connections. These connections, in turn, may inhibit the transmission of nociceptive impulses. This pain modulation occurs through pain inhibitory

substances such as serotonin, noradrenaline, and endogenous opioids or endorphins. Analgesic techniques such as massage are based upon this mechanism (4).

When low back pain is associated with radicular syndrome, the pain radiates to the lower limbs. In these cases, nerve compression may occur due to disc herniation, or spinal canal narrowing. However, irritation of the sciatic nerve may also occur in the piriformis muscle syndrome, which is caused, among other reasons, by a location variation between this nerve and the muscle (5, 6).

Causes of low back pain include activities in sitting posture (with or without excessive load), driving and obesity (7, 8, 9). All these factors may be directly or indirectly related to the body posture (10, 11), which is considered as a sensorimotor function modulated by neuromuscular tone and influenced by an individual's morphological, functional, psychological and sociocultural balance.

In the presence of a persistent pain state or musculoskeletal changes, the human body, like any system, starts saving energy in order to keep functioning. Thus, postural compensations may occur in pain syndromes such as chronic low back pain to help maximize the performance of the musculoskeletal system or save energy in general. Nevertheless, these compensations may reach high levels and then cause new joint problems, increasing the pain that they initially had sought to prevent/reduce. Therefore, in the presence of a chronic pain, postural realignment may prove of vital importance for the complete remission of symptoms.

However, if the production and adjustments of the upright posture are controlled by the central nervous system (CNS), using sensory information concerning the balance of the body or its segment portions, it is certain that this will occur not only in relation to the gravitational force or antalgic mechanisms, but also in response to the individual's interactions with his surroundings. Thus, postural re-education cannot take into account only the biomechanical aspects of the problem, but also consider the notion of neuromotricity and its connections with mental and emotional aspects of the individual.

Thus, we move beyond the interpretation as purely motor problems to also reflect on the relationship between body scheme, laterality, and spatial and temporal orientation, which are relevant to human psychomotricity. This is mainly because, as

these postural deviations coexist with low back pain, they always assume multifactorial aspects, which also involve interactions with work, cultural and daily activities as parts of a patient's relational life.

Following this psychosomatic perspective of chronic low back pain, Derebery and Tullis (12) had included psychological and social problems among the causes of the syndrome, because he found that job dissatisfaction, low education and social problems were among the various risk factors for low back pain associated with disc herniation. Magora (13) has also found a greater number of individuals with lumbosciatalgia among persons who felt dissatisfied with their work. This indicates that low back pain may be influenced by psychosocial factors in its causation and with regard to the perception of pain.

Studies have also associated pain with depression and anxiety. Depressive symptoms have been found to frequently accompany chronic pain (14). Similarly, a prevalence of depressive disorder of about 30-50% has been found in patients with chronic pain. Around two thirds of patients with persistent pain (as occurs in low back pain), pelvic pain, osteoarthritis and fibromyalgia have a history of depressive disorder (15, 16). Furthermore, studies have demonstrated an increased prevalence of painful physical symptoms in patients with mood and anxiety disorders (17, 18).

The presence of comorbidities such as postural change and psychological problems may affect the quality of life of individuals with chronic low back pain, especially if we take into account the definition of the World Health Organization (WHO) for quality of life. This definition establishes a relationship between health, living standards, housing, working conditions, medical access, environment, feelings and perceptions (19, 20). Thus, socioeconomic, cultural and psychological factors are included in the notion of quality of life.

In addition, low back pain chronicity may also affect a patient's response to treatment. This requires those involved in the problem to use a multifactorial and effective approach, both for the assessment and the prevention and treatment of the syndrome. In this regard, Cecin et al. (21) have reported bed rest as an effective treatment option for low back pain and lumbosciatalgia. They have also reviewed some meta-analysis studies and highlighted the benefits of postural orientation programs. Dias, Brech and Nigro Filho (22) have found no significant results in the treatment of chronic

low back pain using trunk extensors strengthening exercises. In contrast, a comparative study has found a significant improvement in low back pain in a group of patients treated twice a week for ten weeks (20 sessions) with neural mobilization (23).

However, one aspect that remains questionable has to do with the psychomotor and multifactorial approach to the problem, as well as the duration of treatment proposed by the existing protocols, which is relatively long for a chronic disorder whose inherent factor already contributes to a low adhesion of patients to treatments. These individuals often come to the clinics with feelings of discouragement and skepticism, not only because of the work limitations imposed by the syndrome but also due to the fact that these patients usually have already received treatment before (often more than once) for the remission of chronic pain. In most of the protocols studied, treatment has been symptomatic.

Among the available physical therapy resources, the Santhiflex™ method of psychomotor postural re-education (PPR) proposes a comprehensive approach in the treatment of musculoskeletal disorders affecting posture, such as chronic low back pain syndrome. This method was systematized by the author of this study in 2004 and has been taught to other groups of physical therapists at the Santhiflex Center of Psychomotor Postural Re-education, in Salvador, Bahia, since 2007 (24).

In this new postural re-education approach, the purely biomechanical concept of muscle chains was revised by the author from the psychomotor perspective of the myofascial links or kinetic-postural chains, which intermediated by the neuromuscular tone convey different tensions throughout the human body (25). This discussion took place after a scientific dialogue on the psychosomatic unity proposed by Contant and Calza (26), together with considerations about the importance of awareness through movement.

Anchored on the principles of Western classical kinesiology, this psychomotor postural re-education method was also influenced by Eastern medicine, particularly by the Ayurvedic massage therapy, according to which diagnosis and treatment should consider the individual's "biotype", i.e., the set of physical and psychological characteristics that compose an individual. The active-assisted kinesiotherapy used also allows the application of specific myofascial release maneuvers when necessary.

However, other than the remission of musculoskeletal disorders, the Santhiflex™ – PPR method seeks to adapt body schema, body image and motor coordination to the context of the individual's space-time dimensions, related to psychomotor dynamics. These purposes are achieved through motor sequences and special positionings of the body, such as relearning models that are initially applied to the individual patient. In this protocol of care, besides listening, we include reading, drawing and writing as forms of expression that coexist with the patient's body and verbal language. In this perspective, the appropriation of the Sanskrit word "santhi", which means "inner peace", sought to recover the notion of integral health, which advocates the indissolubility between body and mind.

In the context of this study, seeking for an integral treatment of chronic low back pain involves wanting to achieve not only an improvement of pain and musculoskeletal disorders, but also an improvement of quality of life and health in general. Although some studies associate an individual's psychosomatic aspects with chronic low back pain, there is still the need for a physiotherapeutic approach that extend the benefits of these aspects beyond biomechanical effects. It is also important that the benefits of this intervention on pain symptoms take place in a relatively short period of time, in order to reduce the impact on body posture, which tends to be progressive. Thus, the aim of this experimental study is to assess the effectiveness of the Santhiflex™ method in the treatment of chronic low back pain.

Materials and methods

This experimental study originated from a scientific initiation project at the Catholic University of Salvador (UCSal). The study sample consisted of patients with chronic low back pain, of both sexes, aged between 30 and 60 years. The subjects were volunteers whose names were included in the waiting lists of three physical therapy clinics in the city of Salvador/Bahia. Participants were divided into two groups: an experimental group (EG), which was treated with the Santhiflex™ – PPR method; and a control group (CG), which was given a lecture on postural orientation after a first evaluation between March and July 2010.

All volunteers signed an Informed Consent form before beginning the interventions. The study project was approved by the Research Ethics Committee of UCSal (Protocol n. 0096/09, 12/22/2009), in accordance with Resolution n. 196/96 of the National Health Council. These patients also signed a specific authorization for use and disclosure of their images and voices, as well as a waiver pledging that they were not going to receive any other type of treatment for the duration of the intervention, without informing the author of the study first.

The individuals of both groups underwent two evaluations (initial and final) during which the anamnesis data were recorded and dynamic-postural changes were photographed. To quantify the level of pain experienced by a patient, the Visual Analog Scale (VAS) was used. In the VAS, the amount of pain that a patient feels ranges across a continuum from "no pain" to "worst possible pain". Since the EG patients were being treated by five different physical therapists, the two evaluations were performed by these professionals. The CG patients were also evaluated by their own physical therapists before and after receiving the lecture. Considering that the VAS is a subjective scale and its results may be affected when it is administered by different examiners, preparatory workshops were held for the group of evaluators, in order to standardize the measurements and reduce the effects of this trend in studies using the VAS and other tools.

To assess the health-related quality of life of patients, we used the WHOQOL-BREF questionnaire developed by the WHO. The WHOQOL-BREF consists of 26 questions divided into four domains: physical, psychological, social relationships and environment. This questionnaire has been widely used, tested and validated in several countries, including Brazil.

In the physical/postural examination – performed in the orthostatic position –, each individual was placed in front of a symmetrograph and behind the plumb line and images of their body from front, profile, and back views were captured with a digital camera fixed to a tripod at a distance of 2.22 cm. The kinetic-functional examination included gait video recording and the administration of the Roland Morris Disability Questionnaire (RMDQ) for pain in general. The RMDQ quantified the disability resulting from low back pain. A study analyzing the psychometric properties of the RMDQ in the Brazilian population with chronic pain has found it to be valid and reliable (27).

The higher the percentage of positive answers, the higher the level of functional incapacity. The universal goniometer and photographs of the finger-ground test were used to assess the range of motion of hip flexion.

In the experimental group, the interventions performed by physiotherapists trained in the Santhiflex™ method took place during twelve meetings of 50 minutes each. The first four meetings were held twice a week, while the other meetings were held only once a week. In the protocol of care, the neuro-psychomotor models of the aforementioned method were used. These models were arranged into semi-static positionings and motor sequences.

The positionings were named as follows: Alternate Clothesline Posture, Symmetrical Clothesline Posture, Diagonal Clothesline Posture, Butterfly on a Roll on the Divan Posture, Basic Butterfly on the Divan Posture, Progressive Symmetrical Butterfly on the Divan Posture, Progressive Asymmetrical Butterfly on the Divan Posture, Butterfly on a Roll on the Wall Posture, Progressive Butterfly on the Wall Posture, Triangle in Dorsal Decubitus Posture, and Triangle Ventral Decubitus Posture. The motor sequences were named as follows: Dancer Sitting Asymmetrically, Dancer Sitting Symmetrically, Dancer Sitting in Open Lateral Lotus Position, Dancer Sitting in Open Circular Lotus Position, Dancer Sitting in Open Rotating Lotus Position, Dancer Sitting in Open Anterior Lotus Position, Dancer Sitting in Closed Lateral Lotus Position, Dancer Sitting in Closed Circular Lotus Position, Dancer Sitting in Closed Rotating Lotus Position, Dancer Sitting in Closed Anterior Lotus Position, Lateral Bipedal Dancer, Circular Bipedal Dancer, Lateral Unipedal Dancer, Circular Unipedal Dancer, Sitting Mermaid, Lying Mermaid, Alternate Table, Asymmetrical Table, and Symmetrical Table.

At the end of treatment, both groups were reevaluated and the obtained data were analyzed using standard statistical software, SPSS-17 and descriptively analyzed. The results were expressed as absolute and relative frequencies, and median with first and third quartiles. The choice to use median as a measure of central tendency, quartiles as a measure of dispersion, and non-parametric tests was due to the fact that data of quantitative variables do not adhere to the normal distribution requirements of traditional parametric statistics, which was verified by the Shapiro-Wilk test. To check for significant

differences in each of the groups, the nonparametric Wilcoxon test was used for paired or within-group samples. We calculated the difference between the final/initial data and performed the intergroup comparison using the Mann-Whitney test. A value of $p < 0.05$ was considered statistically significant.

Results

The study sample consisted of 20 individuals equally and randomly distributed into two groups: the experimental group (EG) and the control group (CG) (Table 1).

Patients treated with the Santhiflex™ method had significant improvement in pain. The median of pain intensity reported by the experimental group was initially 6.5 on the visual scale – ranging from 5.0 (lowest pain intensity reported) to 7.0 (highest pain intensity reported) before treatment. After treatment, the median dropped to 0.00 (0.00-1.25), $p = 0.002$. In the control group, there was no significant change: the initial median of pain was 6.0 (6.0-7.25), and the median after receiving the lecture on postural orientation was also 6.0 (4.0-7.50), $p = 0.125$ (Figure 1).

With regard to the functional incapacity resulting from chronic low back pain, the experimental group had a median of 12.0 (7.75-15.25) before the intervention. After treatment, this median significantly decreased to 1.0 (0.0-5.25), $p = 0.002$. In the control group, the median was 9.5 (7.0-12.0) before treatment and 10.0 (8.0-12.0) after treatment ($p = 0.68$) (Figure 2).

The median number of sessions until an improvement in pain and functional capacity was noticed in the group treated with the Santhiflex™ method was 7.0 – ranging from 5.0 to 10.0, the minimum and maximum number of meetings held, respectively.

In addition to pain, functional disability and postural changes, it was found that the range of

motion of hip flexion in patients of the experimental group was restricted, with a median of 40.0 degrees (36.25-57.50). After treatment, the median increased to 80.0 degrees (70.0-90.0), $p = 0.016$. These results were also observed in the photographs of the finger-ground test, suggesting an improvement in flexibility and postural changes of patients in the EG (Figure 3).

In the last evaluation, there was no significant change in median height and weight neither in the EG nor in the CG.

As for the quality of life of participants, the findings showed a significant improvement in three of the four domains of the WHOQOL-BREF. In the physical and psychological domains, there was a significant improvement in quality of life in patients treated with the PPR method, ($p < 0.05$). Similarly, in the domain four, related to the perception of the environment, after the treatment, changes in the experimental group were significant ($p = 0.002$) while in the control group these differences were minimal and not statistically significant ($p = 0.902$).

Discussion

The findings show that there was complete recovery from low back pain in the experimental group. This statistically significant improvement was achieved after a median of seven meetings. In the control group, patients' pain level was found to be unchanged from the initial value, even after the lecture on postural orientation. Thus, the results point toward the effectiveness of the Santhiflex™ method for the treatment of chronic low back pain, especially when considering that the medians of pain were at the same level for both groups in the initial evaluation and that the patients of both groups did not receive any other treatments that could have affected the results of this study.

Table 1 - Characterization of participants in the experimental and control groups

Characteristics	EG (n = 10)	CG (n = 10)
Sex (male/female)	2 / 8	1 / 9
Age (years)	46.50 (33.5/58.75)	47.50 (42.0/59.50)
Height (cm) minimum/maximum	1.56 (1.5/1.70)*	1.58 (1.50/1.63)*
Weight (Kg) minimum/maximum	71.60 (49.87/86.25)*	77.50 (66.10/91.75)*

Note: EG = experimental group; CG = control group; n = EG and CG population.

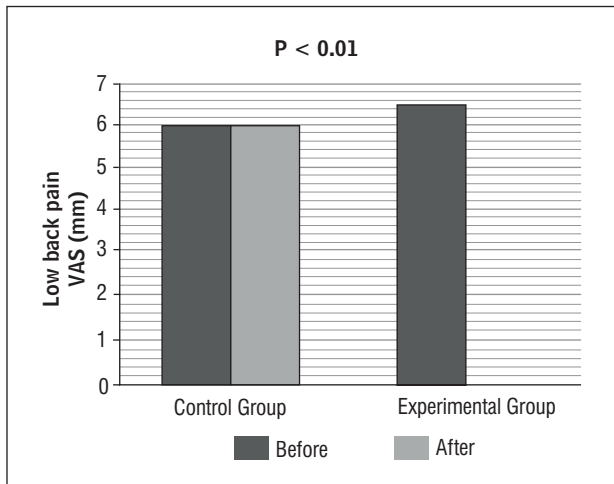


Figure 1 - Comparison of the medians of low back pain between groups, as rated through VAS

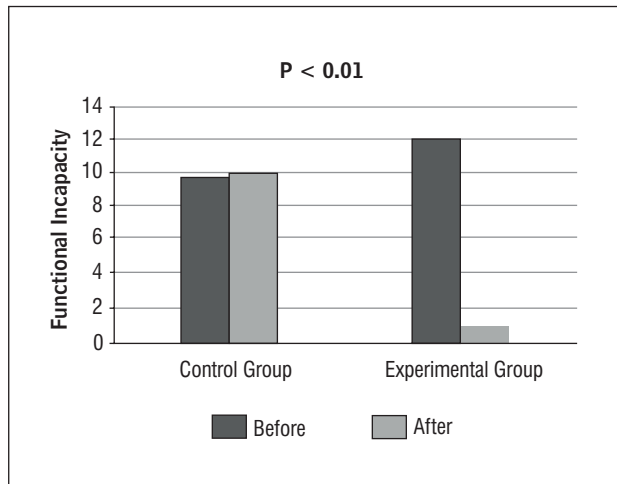


Figure 2 - Comparison of the medians of functional incapacity between groups, as rated by the RMDQ

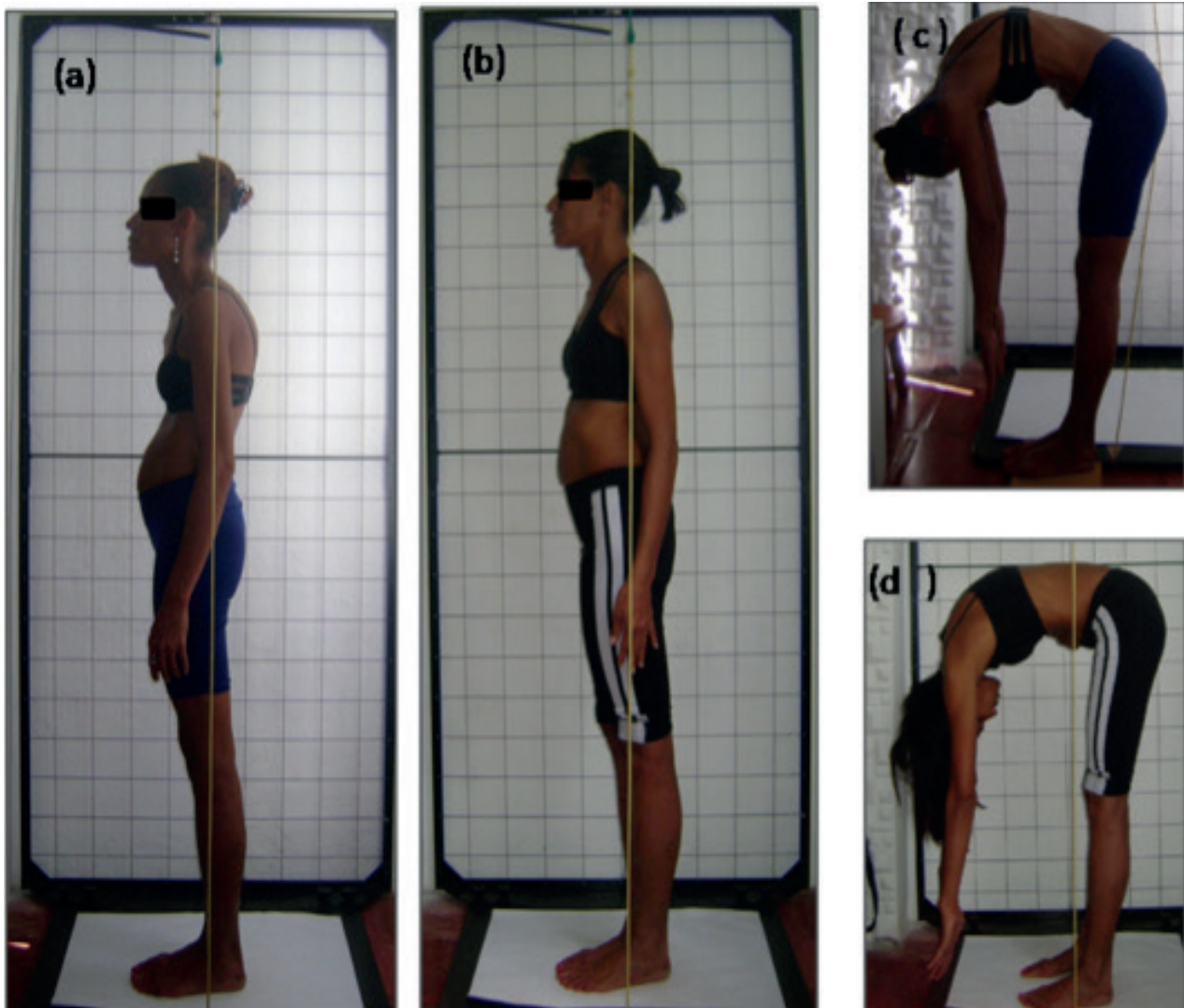


Figure 3 - Postural changes in the sagittal plane and finger-ground test: pre-intervention (a/c) and post-intervention (b/d)

It is important to point out that, in studies aimed at assessing the efficacy of a therapeutic method, the duration of treatment until the desired result is achieved should be taken into consideration, because the efficiency of an activity is also measured in terms of the energy expended and the time spent on its implementation. In addition, clinical practice has shown that treatment response time for chronic diseases may influence the motivation and persistence of patients in following the proposed therapy, especially when considering the fact that most of these individuals have already received treatments before in search of a solution to the evil that afflicts them.

The literature highlights the coexistence of functional incapacity with chronic low back pain, which causes difficulties in the performance of daily life activities or even result in the impossibility to perform them (4). The results of this study confirm this finding, because the functional capacity of participants was reduced about 50% in both groups, according to the initial evaluation. This value corresponds to the median scores found and is relatively high for the age group of the study population. However, after being treated with the Santhiflex™ method, the functional disability score of the experimental group decreased significantly, whereas the score increase in the control group was not statistically significant.

In addition to confirming the assumptions of this study that, in the presence chronic low back pain, analgic mechanisms such as limitation of motion range and various levels of postural changes may arise, our results also show an improvement in these two aspects in the group treated with the RRP method. Although these results achieved greater clinical than statistical visibility, they suggest that the extension of the benefits of this therapeutic resource goes beyond analgesia in patients with chronic low back pain, indicating an improvement in function and in morphological-postural balance.

Another key aspect mentioned in the literature and analyzed in this study is the quality of life of patients with chronic low back pain. With regard to domain one, essentially physical, questions are related to pain, discomfort, energy available to perform daily tasks, sleep, activities of daily living, dependence on medication or treatments, and working capacity. In domain two, questions are related to the psychological dimension of individuals, and include issues such as self-esteem, appearance and body image.

Both in the physical domain as in the psychological domain, changes in the quality of life of patients in the EG were statistically significant after treatment, even when compared with the control group, for which the change was not statistically significant. This indicates the extent of the benefits of this therapeutic method. In domain three, the improvement in quality of life was not significant, while in domain four, whose questions are related to the perception of the environment, the last evaluation revealed a significant improvement in the quality of life of patients treated with the Santhiflex™ method.

Although the literature has indicated the influence of psychosocial factors in the causation and perception of low back pain (16), in this study the remission of pain and functional incapacity in the EG occurred prior to the improvement in the quality of life of these patients, which was re-assessed at the end of treatment. This finding reinforces the relationship between pain, psychosocial aspects and quality of life, indicating the need to conduct longitudinal studies to establish causality.

Final considerations

According to the results obtained in this study, it can be inferred that the Santhiflex™ method for psychomotor postural re-education is effective in the treatment of chronic low back pain.

In addition to complete remission of pain, the benefits obtained by using the method significantly extended to the impact of chronic low back pain – both at the somatic level and in the psychic dimension – on the functional capacity and quality of life of patients who received the treatment.

A negative aspect of this study was the large number of evaluators. Although all examiners participated in a preparatory workshop in order to standardize the methods of data collection, this fact could have affected the results. Another negative aspect was that a sample calculation (to indicate the number of subjects suitable for this type of study) was not carried out. This information could have been obtained in a pilot study or from articles taken as reference. However, the lack of financial support as well as of studies of this nature have prevented these possibilities.

The improvement observed in patients in the experimental group regarding postural changes and range of motion not only reinforces the extent of these

benefits, but also suggests a likely impact of low back syndrome on postural balance, which should be investigated in studies with this objective.

Thus, the availability of this therapeutic option for the treatment of chronic low back pain contributes to a lasting resolution of the problem and a greater understanding of this syndrome, increasing the possibilities for further research in physical therapy within the context of integral health.

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