



# The isostretching in low back pain chronic in college students

## O isostretching na dor lombar crônica de estudantes do ensino superior

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### ABSTRACT

**Introduction:** Chronic low back pain is a symptom located in the lower region of the back due to an abnormal change in this region. Among the methods to promote the relief of this symptom, the isostretching can be included, considered a global postural method. **Objective:** To investigate the isostretching technique on low back pain in college students. **Method:** The study included 10 subjects aged between 19 and 29 years. In the first stage they just met at home for a month the Low back pain Frequency Journal and in the second stage of the research they have been evaluated following items in an evaluation form, continued filling out the diary and were submitted to 15 sessions. **Results:** We observed significant improvement in back pain between participants during treatment with isostretching, where the average value was  $6.40 \pm 0.69$  before treatment and  $2.40 \pm 0.54$  was later. Regarding the 3rd finger test soil was demonstrated according to the results obtained before and after treatment increased flexibility, the average value was  $17.05 \pm 5.04$  before treatment and after was  $10.50 \pm 3.97$ . Regarding the Schober test could be seen some improvement. Before treatment, the mean value was  $15.15 \pm 0.59$  and  $15.20 \pm 0.64$  was after. **Conclusion:** The results reported in this study show that the Isostretching method has not shown significant results in the mobility of the spine of the research participants, according to the analysis of data obtained by measuring with the Stibor and Schober tests. The method proved to be effective in improving chronic back pain and flexibility.

**Keywords:** Low Back Pain; Physiotherapy; Flexibility.

### RESUMO

**Introdução:** A dor lombar crônica é uma sintomatologia localizada na região inferior do dorso decorrente de uma alteração anormal nessa região. Dentre os métodos capazes de promover o alívio desse sintoma, inclui-se o Isostretching, considerado um método postural global. **Objetivo:** Verificar o efeito da técnica do isostretching na dor lombar em estudantes do ensino superior. **Método:** Participaram deste estudo 10 sujeitos, com idade entre 19 e 29 anos. Na primeira etapa eles apenas preencheram em domicílio durante um mês o Diário de Lombalgia e na segunda etapa da pesquisa os mesmos foram avaliados, seguindo os itens de uma ficha de avaliação, continuaram o preenchimento do Diário e foram submetidos aos 15 atendimentos. **Resultados:** Foi observado que houve melhora significativa da dor lombar entre os participantes durante o tratamento com o isostretching, onde a média dos valores foi  $6,40 \pm 0,69$ , antes do tratamento, e posteriormente foi  $2,40 \pm 0,54$ . Em relação ao teste do 3º dedo ao solo, foi evidenciado de acordo com os resultados obtidos antes e após o tratamento o aumento da flexibilidade, a média dos valores foi  $17,05 \pm 5,04$ , antes do tratamento, e após foi  $10,50 \pm 3,97$ . Com relação ao teste de Schober não foi observado mudança significativa. Antes do tratamento, a média dos valores foi  $15,15 \pm 0,59$  e após foi  $15,20 \pm 0,64$ . **Conclusão:** Os resultados reportados neste estudo evidenciam que o método Isostretching não demonstrou resultados significativos na mobilidade da coluna dos participantes da pesquisa, de acordo com a análise dos dados obtidos através da mensuração com os testes de Stibor e Schober. O método mostrou ser eficaz na melhora da dor lombar crônica e da flexibilidade.

**Palavras-chave:** Dor Lombar; Fisioterapia; Flexibilidade.

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## INTRODUCTION

Low back pain is being currently considered a major public health problems, for reaching most of the population and thus entail high cost to health systems. Low back pain often causes the removal of people from their daily activities, social and labor.

Chronic low back pain is a symptom located in the lower region of the back that is due to an abnormal change in the region and is considered one of the major factors of morbidity and disability.<sup>(1,2)</sup>

Low back pain are classified into specific or nonspecific. Low back pain called specific is due to a known cause and diagnosis has very well defined. In contrast, nonspecific low back pain are idiopathic, ie not have known cause, have non defined diagnosis and accounting for 80% of all cases reported in adult patients with low back pain and affect mainly individuals between 20 and 55 years. The nonspecific low back pain is most cases of pain reported by the population. Usually occurs by an imbalance between the functional load that is imposed in excess to the ability of the individual while performing their daily activities.<sup>(3)</sup>

Low back pain is caused by multiple factors, including demographic and socioeconomic causes, sedentary lifestyle, smoking, increased survival, obesity, poor posture for long periods at work, among others. There are several theories for the genesis of pain in the lower back, among them underactive of the paraspinal muscles is responsible for the destabilization of the spine in young people with low back pain.<sup>(4-7)</sup>

Back pain limits physical fitness, the emotional and cognitive people, especially college students and may cause changes and/or limitations in aspects of quality of life and functional capacity. Currently the occurrence of this painful condition have greatly increased in adolescents and young adults, with a percentage ranging from 30 to 51%.<sup>(8,9)</sup>

It is believed that the appearance of these symptoms occur by changes in the spine biomechanics. These changes caused by excessive functional load and incorrect postures are checked routinely in students when they develop their academic activities and ergonomic features.<sup>(10)</sup>

The Isostretching is a global postural gymnastics technique based on a balance of therapeutic exercise that emphasizes stretching and muscle strengthening. Through it, they can be relieved muscle tension and avoided compensation which encourage changes in the spine. The exercises are made through postures in which are prioritized isometric strengthening, lengthening the global muscles, breathing, self-growth and the proper position of the hip and spine. Therefore, the method is considered corrective, educational, preventive, plasticizer and toning.<sup>(3,10,11)</sup>

This therapeutic approach is used to treat people who present chronic painful diseases, providing conditioning and limiting compensatory movements. There are principles that

correct body posture and foremost sets results in people with back pain.<sup>(12)</sup>

The exercises of this technique are performed with the utmost correction of the spine, prompting her self stretching. As a result, this method provides body awareness, increase muscle flexibility, improve neuromuscular control, joint mobility, muscle tone, strength and breath control.<sup>(13)</sup>

Thus, the aim of this study was to evaluate the technique of isostretching effect on low back pain in college students.

## METHODS

This study was approved by the Ethics Committee for Research involving Human Beings of Faculdade Integral Diferencial - FACID DE VRY with the process 26519113.2.0000.5211 number, in accordance with Resolution. 196/96. All subjects were informed about the objectives of the study and signed the informed consent form prior to admission in the experiment. The same study was designed as a prospective case, whose nature is analytical with a quantitative approach, where it was verified the effects of isostretching in the treatment of low back pain in college students.

The data were collected in private college in the city of Teresina-PI, whose criterion of choice was intentional. The sample consisted of 10 participants chosen at random. Were used as inclusion criteria: subjects aged between 19 and 29 years, college students with chronic nonspecific low back pain, persistent for more than three months, they were not making any treatment for low back pain and sedentary.

Exclusion criteria were subjects with musculoskeletal injuries in other joints that isostretching is contraindicated, diseases that impair cognition, subjects with a history of back surgery, pregnancy, people with cardiovascular and/or cardiorespiratory diseases with exercise contraindication.

The research followed in two steps. In the first stage the participant was not submitted to treatment, only filled the diary of low back pain at home for a month, in which there was objective information about the intensity of low back pain, reported by the patient in the course of the week, based on the visual analogic scale (VAS) values. During this step was maintained contact with participants by phone once a week to monitor the diary fill.

In the second stage of the study participants completed the diary and underwent an assessment and intervention. The evaluation was conducted following the steps of an evaluation form, where they were collected the following data: age, weight, height, BMI, pain reported by the patient based on the VAS of pain, the third finger to soil test and Schober test.

The Isostretching was carried out with the frequency of three weekly sessions, totaling 15 meetings, for five consecutive weeks, with an average duration of 40 minutes each service. In each service positions were held in the supine position, leaning, sitting and standing, and the time spent in each position was governed by expiration. They were held six



repetitions in each posture. Progressions were made during the search in the third week, with the evolution in the level of difficulty of the positions that were already being carried out by requesting an increase in the stretch when performing these postures and the fourth week were included the ball and the bat during the performance of postures.

During the call the participant was instructed on the placement of the pelvis in anteversion or retroversion which was determined by the participant’s position has not yet walked on respiration, which includes a profound and prolonged exhalation from 6 to 10 seconds or more.

The variables were pain intensity by VAS pain registered in the evaluation form and Low Back Pain Diary, flexibility of lumbar spine measured with the third finger to test soil and mobility of the lumbar spine through the Schober test.

The data were divided into spreadsheets Microsoft Office Excel 2010 program where they were organized in tables. Later they were subjected to statistical tests T of Student, for simple comparisons, Two-way ANOVA for comparison multiseriate, both tests with a 95% confidence interval and significance of  $p < 0.05$ . Therefore, they were transferred to the statistical program Graph Pad Prism 5.0.

## RESULTS

After being held 15 consultations with Isostretching method, we noticed a difference between the results of tests performed before and after treatment. In Table 1, it can be seen that no significant change in Schober test, during tilting, with isostretching method. Before treatment, the average value was  $15.15 \pm 0.59$  and at the end it was  $15.20 \pm 0.64$ . The statistics showed that, after treatment, the significance of the Schober test ( $p = 0.9173$ ) was not effective.

In relation to the third finger to the soil test, increasing flexibility has been evidenced, the average value was  $17.05 \pm 5.04$  before treatment and at the end it was  $10.50 \pm 3.97$ . Statistical analysis showed that at the end of treatment flexibility increased in all study participants ( $p = 0.0032$ ) also as shown in Table 1.

It was also observed a significant improvement in pain assessment, made by the VAS, where the mean value was  $6.40 \pm 0.69$  before treatment and at the end it was  $2.40 \pm 0.54$ . Statistical analysis showed that at the end of treatment, the pain decreased ( $p = 0.0003$ ), as shown in Table 1.

On Figure 1, can be seen the improvement of low back pain, low back pain through the low back pain diary applied before and during treatment, in which there was filling out every day of the week with the quantification of pain that participants reported feeling. Pain measures followed the VAS pattern.

In accordance with Figure 1, it can be seen that an improvement in pain reported by participants in treatment. Before the method, the average for the intensity of pain in the first week was 4.129 and during the attendance was 2.743. In the second week the mean before starting the treatment was 4.171 and during the intervention was 2.357. In the third week the average method was 4.229 before and during the treatment was 1.786. In the fourth week average before treatment was 4.043 and during the operation was 1.386. And in the fifth week of care with isostretching average pain of participants was 1.414.

## DISCUSSION

In one study, there was an increased flexibility with isostretching, this study evaluated the flexibility from data measured with the third finger to soil test before and after 10 sessions with this intervention. This technique prevents the compensatory rotation by means of a powerful contraction of antagonistic muscles and due to this duplication, has both a reinforcement and an elongation.<sup>(12)</sup> These data corroborate the present study where it was observed that there was also a significant increase flexibility, which was evaluated in the same way as the research cited above.

Isostretching promotes elongation from a static isometric contraction, which is very effective for increasing the flexibility of hamstrings, being justified by facilitating firing of the Golgi tendon organ by slow static stretching, which generates the

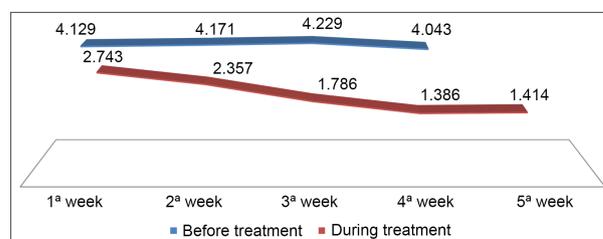


Figure 1. Average of the daily pain of the patients before and during treatment. Teresina, 2014.

Table 1. The presence of nociceptive troublesome and flexibility rating before and after treatment. Teresina, 2014.

VARIABLES	BEFORE TREATMENT		AFTER TREATMENT		P
	M	SD	M	SD	
Schober (cm)	15.15	0.59	15.20	0.64	0.9173
T3ºDS (cm)	17.05	5.04	10.50	3.97	0.0032**
VAS	6.40	0.69	2.40	0.54	0.0003***

Subtittle: M, mean; SD, standard deviation; P for t Student teste, with confidence interval of 95% and significance of  $p < 0.05$ . Source: original data.



inhibition of the stretched muscle.<sup>(14)</sup> This fact could justify the amplitude gain in the third finger to the soil test in this study.

In the interest of improving the range of motion, can promote the modification of muscle viscoelastic properties, reshaping it to increase its flexibility. In other words, invades the muscle elastic constraint of the patient, the point from which the tissue does not return to its original shape and size.<sup>(15)</sup> The methodology of this study does not say whether the flexibility gain represented plastic changes only that there was gain.

The mobility of the posterior musculature is usually verified by the 3rd finger to the soil test.<sup>(16)</sup> Regarding the flexibility, this study obtained similar results to studies seeking to verify the improvement of postural changes, pain and quality of life. These were performed with the same method, but had participants with different dysfunctions.<sup>(17,18)</sup>

In a study that sought to determine whether the amount of calls with isostretching interfered with their results observed that the flexibility gain only occurred in the group that made more than 30 meetings.<sup>(19)</sup> The findings of this research are not consistent with the present study, in which it was observed that with a shorter period of care can achieve significant results in improved flexibility.

Increased flexibility can favor the improvement of chronic low back pain, as it was seen that this can be one of the causative factors of this dysfunction. Muscle shortening of the hamstrings can cause back pain as a result of bad handling of the pelvis still being able to promote various postural changes.<sup>(12)</sup>

Isostretching method demonstrates efficacy in reducing low back pain from the use of the self-growth of the isometric contraction and muscle stretching, and a slow and prolonged exhalation. With these features, the method improves the muscle imbalance in capabilities, promoting the development of muscle strength, improved disability and decreased pain.<sup>(4)</sup> This study can verify this improvement in pain and according to the above cited studies that could it is justified by improved flexibility such as the hamstring muscles, which are tested in the third finger to the soil test.

This method works in pain improvement by strengthening the deep paraspinal muscles. It has been seen that the weakness in this muscle can lead to painful condition in the lower back.<sup>(8)</sup> In other research, which aimed to evaluate the effects of isostretching on the improvement of low back pain, also justified the reduction of pain symptoms from strengthening these muscles.<sup>(4,20)</sup> The study attributes the strengthening of paraspinal muscle improvement of low back pain, however we can not say the same for this research since it was not evaluated the strength of these muscles.<sup>(8)</sup>

The isometric contraction in isostretching happens statically and the shortening of the contractile elements brings the stretch of the elastic elements that act in series. This stretching occurs anarchic in series: a few muscle groups are contracted and others are relaxed, while others are at different degrees

of shrinkage. This uncontrolled organization sponsored by the elastic elements in series has the function of absorbing the various strains.<sup>(12)</sup> It was expected a significant improvement in mobility tests of the lumbar spine and Schober, since the method provides reduction of muscular tension. However it did not, it is believed that one reason may be the difficulty in the participant's perception to perform an isometric contraction in the paraspinal muscles.

## CONCLUSION

The results reported in this study show that the Isostretching method did not show significant results in the mobility of the lumbar spine of research participants, according to the analysis of data obtained by measuring with the Stibor and Schober tests. The method proved to be effective in improving chronic back pain and flexibility.

## AUTHORS CONTRIBUTION

PFBS carried out the study of the effects of Isostretching in chronic low back pain of the participants, was responsible for the implementation of the research methodology, participated in the statistical analysis and drafted the manuscript. RHMC attended the orientation and implementation of Isostretching techniques, took part in the study design, assisted in the statistical analysis and assisted in drafting the manuscript. LKBLM carried out the study of the effects of isostretching the participants, participated in the study design, coordinated and prepared the same and helped draft the manuscript. All authors read and approved the final manuscript.

## COMPETING INTERESTS

The authors declare no conflicts of interest.

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