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SEGMENTAL STABILIZATION FOR THE TREATMENT OF CHRONIC LOWER PAIN: INTEGRATIVE REVIEW

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Abstract: Introduction: segmental stabilization proves to be effective for muscular balance, promoting the reduction of injuries to the lumbar region of the spine and thus resulting in improved quality of life. Objective: to analyze the effectiveness of low back pain treatment through segmental stabilization. Methodology: This was an integrative literature review, analyzing scientific publications over the last ten years. The steps suggested in the literature were used to carry out an integrative review. Results: the final sample consisted of only 9 articles. After systematic analysis of these, it was necessary to include the following thematic axis: segmental stabilization in low back pain X benefits and strengthening factors. Conclusion: segmental stabilization showed a positive impact on the treatment of low back pain in most studies. Therefore, obstacles were observed that permeate the applicability of segmental stabilization in the treatment of low back pain, such as the absence of specific guidelines.
Keywords: low back pain, chronic pain and exercise therapy

INTRODUCTION

Chronic spinal pathologies are considered the most prevalent diseases in the world and represent one of the main causes of years of life lost due to disability, being the first in countries like Brazil. The prevalence of problems that lead to back pain among adults in Brazil is similar to that found in other countries. Spine comorbidities are a major cause of people seeking medical care, cause significant losses in quality of life and are the main cause of disability retirement.

Low back pain or low back pain is a dysfunction that can arise from traumatic, biomechanical or biopsychosocial events, which encompasses both sexes and is characterized by the presence of acute or chronic pain. It is responsible for high direct and indirect expenses due to absenteeism from work, loss of productivity and spending on medicines, physiotherapy and surgeries, to the detriment of treatment (GBD, 2016).

From this perspective, low back pain is seen as a public health problem of utmost clinical, social and economic importance that affects the population indiscriminately and that must be managed effectively. Adequate monitoring of the painful experience is only possible through the evaluation and measurement of this event, which is subjective in nature and has directly related factors (OLIVEIRA et al., 2015).

The treatment of lumbar pain and dysfunction involves a multidisciplinary team, which develops its activities with the general purpose of controlling pain and promoting well-being and the individual's return to work activities. Physiotherapy has numerous therapeutic resources that help increase pain relief and rehabilitate these patients (BOTTAMEDI et al., 2016).

The treatment of low back pain through segmental stabilization exercises becomes extremely relevant for study as they are evidence-based practice exercises and are highly effective in the practical experience of using kinesiotherapy.

Therefore, the study aims to analyze, based on scientific studies, the effectiveness of low back pain treatment through segmental stabilization. As well as identifying the prevalence profile of low back pain; verify the real impact of low back pain in Brazil and around the world and highlight whether there are changes in the patient's social context.

THEORETICAL REFERENCE

CHRONIC LOW BACK PAIN

Low back pain is defined as pain that occurs in the region of the lower trunk that goes from the costal arch to the gluteal fold. This pain can radiate to the buttocks or lower limbs towards the sciatic nerve, receiving the name lumbosciatica. The presence of pain can lead to inability to move and work, being a complication that will be present at some point in life and that often goes unnoticed (BOTTAMEDI et al., 2016).

For Lessa and Lopes (2013), on average 80% of people will experience low back pain at some point in their lives, with around 10 million people in Brazil becoming disabled due to the symptoms. Korelo et.al. (2013) complete with data collected from the World Health Organization that among the 80%, half of individuals will develop chronic problems. The appearance of low back pain is proportional to advancing age, and women are more likely to develop this complication due to the repetitive overload exerted in domestic activities.

As we age, symptoms begin to appear and the discovery of the pathology will be necessary to begin specialized treatment and thus prevent the disease from worsening. Complications such as back stiffness, immobility, paralysis, dysfunctions of organs such as intestines and bladder and low back pain radiating or not to the lower limbs may arise, which are called low back pain and low back pain respectively (LESSA; LOPES, 2013).

SEGMENTAL STABILIZATION

Manual therapy known as segmental stabilization is based on motor control using muscular structures to offer protection to joint and neural structures, promoting strengthening through awareness of muscle contraction, resistance training of the lumbar stabilizing muscles and also proprioceptive stimulation. To maintain body balance, the stability of the pelvic girdle and lumbar spine must be preserved (LACERDA; MACÊDO; CARVALHO, 2014).

According to Sobreira (2013), lumbar segmental stabilization is characterized by isometry, low intensity and synchrony of the deep trunk muscles. Therapy that aims to improve support for the lumbar spine in addition to allowing gains in pelvic lumbar functional stability and reducing cases of common injuries and discomforts in this region, such as low back pain.

Maintaining stability depends on the interaction of three systems. The passive consisting of the vertebrae, intervertebral discs, joints and ligaments that promotes most of the stabilization, the second is the active that includes muscles and tendons, and the third is neural control (SOUSA and MEIJA, 2013).

The passive system allows stabilization due to the viscoelastic characteristic and the neural system is responsible for receiving information from the passive and active systems in addition to capturing changes in balance and determining the necessary changes, activating the muscles correctly to reestablish stability (SIQUEIRA et al, 2014).

Lacerda, Macêdo and Oak (2014), highlight that for stabilization training it is necessary to follow basic principles of motor learning: perception of muscle contractions and the position of the spine; spinal control by performing simple exercises with the limbs; the exercises become more advanced and maintain control of the spine; maintaining spinal control automatically in a progression of functional activities.

For Muniz and Rodrigues (2013), stabilization can be divided into three phases. In the cognitive phase, exercises occur that promote the co-contraction of local muscles,

separately from global muscles, with the pelvis neutral. The second is associative in which motor learning occurs and exercises are applied to correct imbalances in strength and train muscular resistance. The last phase called automation involves performing exercises of daily living activities while maintaining stabilization during execution.

The exercises applied work on the stability of the lumbar spine to treat lumbar pain. Stability starts to be reestablished through exercises that seek to improve neuromuscular control, strength and resistance of trunk and pelvic floor muscles. Stabilization aims to alleviate pain, improve functionality and delay the progression of the disease (SIQUEIRA et al., 2014).

METHOD

This is an integrative, descriptive literature review with a qualitative approach, whose theme was to analyze, based on scientific studies from the last ten years, the effectiveness of low back pain treatment through segmental stabilization.

The integrative review aims to gather, evaluate and synthesize the results of research on the topic in a systematic and orderly manner, being a means of deepening knowledge about it, investigating and allowing the synthesis of published studies, highlighting the current state of the field. knowledge as well as its gaps (SANTOS; NASCIMENTO, 2021).

The steps suggested by the literature were used to carry out an integrative review, divided into the following steps: establishment of the hypothesis and objectives; establishment of inclusion and exclusion criteria for articles (sample selection); definition of the information to be extracted from the selected articles; analysis of results; discussion and presentation of results and the last stage consisted of presenting the review.

The question proposed to support this article was: Are segmental stabilization exercises effective in treating chronic low back pain?

To compose the sample, articles found in the Virtual Health Library (VHL) were used. For greater effectiveness of the analysis, the standardized descriptors in DeCS (Health Science Descriptors) were used: low back pain, chronic pain and exercise therapy, associated with the Boolean operator AND. The inclusion criteria were: articles that were in full; in Portuguese and Spanish; published in the period between 2012 and 2022. The exclusion criteria were articles that were outside the thematic axis, repeated in the database, that were not available and that did not answer the research problem.

In the first stage, using the descriptors without applying filters, 730 articles were found in the VHL database. We continued using the filters with the inclusion criteria already mentioned, resulting in 18 articles. These, after careful reading of the titles and abstracts, resulted in 16 articles. After exhaustively reading the articles in full to check whether they answered the research problem, the final sample consisted of only 9 articles, as shown in figure 1.

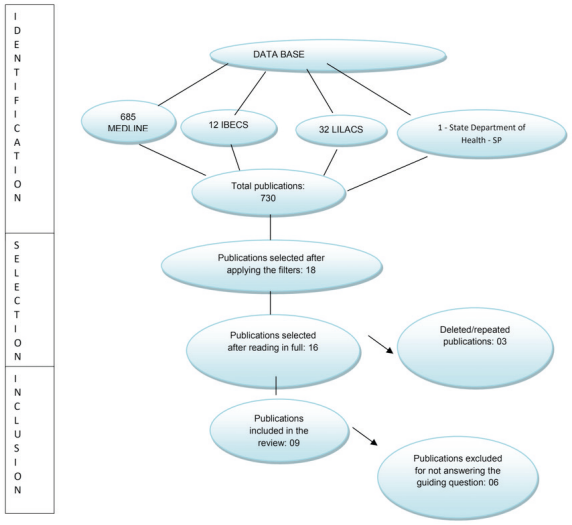

Figure 1 – Flowchart and procedures used to select articles.

Source: Prepared by the authors (2022).

The script was prepared with the following variables: Title of the article, authors/year of publication, journal, objectives, methods/types of research, main conclusions.

The data was validated by two researchers. As an endorsement of all review items, the PRISMA protocol with 27 assessment items was used. There was no funding for the research.

DATA ANALYSIS AND INTERPRETATION

After classifying all the material, the data was organized, facilitating visualization and understanding of the material selection process. Table 1 presents the specifications of each of the selected articles, describing the title of each article, the names of the authors and year of publication, the journal in which the article was published, the objective, method and/or type of research that was carried out to construct the article and the main conclusions.

Eighteen articles met the established inclusion criteria, (09) in LILACS, (5) in MEDLINE, (03) in IBECS and (01) in the São Paulo State Health Department, and (03) articles were excluded due to duplication in the databases, (06) were excluded after reading in full. After exhaustive reading of the texts, only (09) articles answered the guiding question and comprised the final sample.

Therefore, after systematic analysis of the articles, it was necessary to include the following thematic axis: 4.1 segmental stabilization in low back pain X benefits and strengthening factors.

SEGMENTAL STABILIZATION IN LOW BACK PAIN X BENEFITS AND STRENGTHENING FACTORS

The causes of chronic low back pain can be classified as specific, in this case those resulting from herniated discs, fractures and osteoporosis, and those of non-specific causes, that is, those in which the etiological factor is unknown. When we talk about non-specific cases, the association with inadequate posture or due to excess weight is notable, components that can alter the biomechanics of the lumbar spine, contributing to the appearance of pain and even the patient's disability (VAEGES; BARBOSA, 2017).

Lumbar instability originates when weakness and fatigue take over the spinal stabilizing muscles, leading to lumbar injuries and strains, which begin through excessive movement and inappropriate postures used inappropriately (SIQUEIRA et al., 2014).

In this sense, many methods have been presented as treatment options for low back pain, mainly to the detriment of chronic cases that require more complex follow-up and management. Numerous techniques aim to minimize pain and restore the individual's functionality; however few studies precisely detail the methods used (LACERDA; MACÊDO; CARVALHO, 2014).

Increasingly, segmental stabilization is being used, the method of which is gaining ground in the prevention and treatment of low back pain. Its objective is to stimulate and strengthen the main muscle groups involved in lumbar biomechanics, mainly the deep muscles of the lower trunk, such as the transversus abdominis and multifidus (SIQUEIRA et al., 2014).

The benefits attributed to treatment programs based on the segmental stabilization technique for treating low back pain are being documented in some studies (SILVA et al., 2014).

According to Valpato et al. (2012), in a systematic review that addressed studies that used follow-up stabilization as a therapeutic intervention for low back pain, reported promising results in terms of reducing pain,

PERIODIC	AUTHOR/ YEAR	TITLE OF THE ARTICLE	GOALS	RESEARCH METHODS AND TYPES	MAIN CONCLUSIONS
Rehabilitacion (Madr) *":"releas*	Hernando-Jorge *et al.*, 2021.	Therapeutic exercise as a treatment for chronic spinal pain: systematic review of randomized clinical trials.	To analyze and compare the effectiveness of different types of therapeutic exercises in people with chronic back pain.	Systematic review	The different types of therapeutic exercises had significant effects on reducing pain, reducing disability and improving the quality of life of patients. The results show that there is no therapeutic exercise modality that is superior to the others. The combination of different types of therapeutic exercises can be a complete tool for managing chronic back pain.
Rev. int. medem. Ciência. Aja fi. esporte	Pérez-de-la-Cruz *et al.*, 2015.	Effectiveness of a Roman pilates program in non-specific low back pain. pilot studio	Verify the effectiveness of the Pilates Romana method to obtain greater flexibility of the spine, along with an improvement in its mobility, as well as the pain that patients experience in their daily lives.	Clinical trial	Statistically significant differences were found in relation to pain (VAS scale, finger-to-ground distance, Schöber test (flexibility in the sagittal plane), lateral flexion (flexibility in the frontal plane) and in several items of the SRS-22 scale, with p values < 0.001. Therefore, this method can be used to improve pain, axial flexibility, function and aspects related to quality of life (AU)
Rev. bras. med. trab	Bottamedi *et al.*, 2016.	Treatment program for chronic low back pain based on the principles of Segmental Stabilization and Spine School	To analyze the effects of a treatment program for chronic LBP based on the principles of Segmental Stabilization (ES) and Spine School (CE).	Experimental study	Both groups showed improvement in all variables controlled in the study. There was no difference between the groups. The treatment program involving the principles of ES and EC was beneficial for all patients involved in the study. CE did not bring additional benefits to patients in this group. New studies with a larger number of participants and long-term follow-up are necessary to check the potential benefits of this therapeutic combination, since CE has preventive potential.
Cirugia e Cirujanos	Nava-Bringa *et al.*, 2016.	Adherence to the lumbar stabilization exercise program in patients with chronic low back pain	To know the level of adherence to therapeutic exercise is essential to evaluate the effectiveness of health services, plan strategies, optimize resources and promote the full recovery of patients in less time.	Prospective and observational study	The adherence percentage was 82-84% during the 3 trimesters. There were no correlations between adherence and sociodemographic variables, depression, anxiety or fear of dropping out. Patients classified as adherent showed faster and more significant improvements in pain and function ($p > 0.05$). At the end of the study, all patients had a significant improvement in pain and function. Depressed patients had higher scores on pain and disability scales at the beginning and end of the study. However, neither depression, anxiety nor fear of running were predictors of non-adherence to therapy.
HU rev	Corrêa et al., 2015.	Pilates method versus School of Posture: comparative analysis of two treatment protocols for low back pain	To compare two intervention protocols for the management of chronic non-specific low back pain in women aged 25 to 50 years in terms of pain, functionality and quality of life of the individuals.	Prospective and longitudinal study.	The group treated with the School of Posture obtained better results when compared to the results of the group treated with the Pilates method. However, due to the small number of volunteers, it is not possible to state the differences between the two groups.

Mão. irmã. higiene. Navar	Garcia *et al.*, 2015.	Clinical management of chronic low back pain: synthesis of recommendations based on evidence from existing clinical practice guidelines	Analyze its content and provide a synthesis to improve the translation of this evidence into practice	Systematic review	Exercise and back training establish the foundation of non-pharmacological treatment, providing the strongest evidence as well as the lowest incidence of side effects. Pharmacological treatment is emerging as a resource for controlling pain for a short period of time, and strategies must be planned to control its long-term effects.
Brazilian Journal of Physical Therapy	Miyamoto; Costa; Cabral, 2013.	Efficacy of the Pilates method considering pain and disability in patients with chronic non-specific low back pain: a systematic review with meta-analysis	To systematically review the available evidence on the effectiveness of the Pilates method in patients with chronic non-specific low back pain.	Systematic review	In the meta-analysis, there was a significant difference for pain and disability when compared with no intervention or minimal intervention (difference between means=1.6 points; 95% CI 1.4 to 1.8; difference between means=5.2 points; 95% CI % 4.3 to 6.1; respectively). The Pilates method was not superior for the pain outcome in relation to other exercises in the short term. It is suggested that the Pilates method is more effective than minimal intervention in improving pain and disability in the short term. The Pilates method is not more effective than other types of exercise for improving pain in the short term.
Fisioter. mov	Korelo *et al.*, 2013.	To evaluate the effectiveness of a group kinesiotherapy program combined with the School of Posture, on pain and functional capacity, in individuals with chronic low back pain.	To evaluate the effectiveness of a group kinesiotherapy program combined with the School of Posture, on pain and functional capacity, in individuals with chronic low back pain.	Cross-sectional clinical study	The types of therapeutic exercise for chronic or acute low back pain that are most effective are still quite controversial, however therapeutic exercise is probably the most widely used conservative treatment worldwide.
Rev Bras Anestesiologia	Lizier; Perez; sakata, 2012.	Exercises for treating nonspecific low back pain	Review exercises for treating nonspecific low back pain.	Literature review	The types of therapeutic exercise for chronic or acute low back pain that are most effective are still quite controversial, however therapeutic exercise is probably the most widely used conservative treatment worldwide.

Table 1 – Description of article variables, final version of the study (n= 09). Source: prepared by the author (2022).

as well as improving functional capacity, especially in cases of chronic low back pain. However, it was not possible to identify the superiority of this technique when compared to other conventional therapeutic interventions (BOTTAMEDI, et al., 2016).

In another study involving a program of segmental stabilization exercises for six weeks in individuals with chronic low back pain, it was possible to notice significant differences between the intervention and control groups, including in terms of quality of life. There was a significant drop in pain and disability in the group of study participants and 89% of patients considered the intensity of pain and functional disability acceptable (KOBILL et al., 2017).

Specific exercises that promote independent contraction of the deep muscles of the trunk, associated with contraction of the transversus abdominis and multifidus, allow beneficial effects in reducing pain and disability in patients with chronic low back pain, especially in reducing recurrence after an episode of pain. acute (KOBILL et al., 2017).

The search for muscular rebalancing and biomechanical correction is the main axis for the good evolution of patients with chronic low back pain, with exercise being the safest and most effective way to improve flexibility, strength and muscle function, in addition to minimizing low back pain, playing an important role in both the prevention of low back pain and the rehabilitation of these patients. The association of more than one technique in programs that promote trunk strengthening and stability is effective in reducing low back pain and promotes more efficient results (CORRÊA et al., 2015).

Pérez-de-la-Cruz et al. (2017) mention that to achieve positive results, it is extremely important to adhere to the exercise routine for lumbar stabilization so that pain reduction and functional improvement occur, and so that this improvement appears earlier than in patients who do not adhere correctly. They also explain that although the non-adherent group also improves at the end of treatment, the gain is to a lesser extent when compared to the adherent group. Therefore, it can be proposed that the strongest predictor of improvement is related to therapeutic adherence.

However, for good adherence, the professional needs to explore in his approach: information and advice to the patient, as well as reinforcement techniques, which have proven to be important points in the motivational program to achieve positive results (NAVA-BRINGAS et al., 2016).

Another important and essential point for good results is valuing and following the number of therapy sessions that are proposed within the established treatment, this variable seems to influence the results of established functional programs (NAVA-BRINGAS et al., 2016).

Therefore, although some studies present good results, it is considered a challenge to encourage people with chronic low back pain to become physically active, since this is a population that presents an attitude of fear in their behavior, with interventions being the which would potentially promote long-term encouragement and necessary behavioral changes (GARCIA et al., 2015).

It is important to mention that the implementation of a post-treatment program is as important as the treatment itself in promoting the strengthening and development of self-management skills for the maintenance and perpetuation of results (GARCIA et al., 2015; Intituto de Medicina, 2016).

FINAL CONSIDERATIONS

Initially, it is necessary to mention that the therapeutic method of segmental stabilization is effective in the treatment of chronic low back pain, having the effect of reducing pain levels, improving functional capacity, improving flexibility and quality of life.

It is also worth highlighting the small number of recent studies available in the scientific literature, suggesting that new intervention studies with good methodological quality be carried out to increase the reliability of the results.

We can only admit that there are still obstacles that permeate the applicability of segmental stabilization in the treatment of low back pain, such as the lack of specific guidelines.

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