

Pilates method on pain in patients with low back pain: systematic review

Método Pilates para dor em pacientes com lombalgia: revisão sistemática

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ABSTRACT

BACKGROUND AND OBJECTIVES: The weakness of the trunk extensors is one of the main causes in the development of low back pain in a large part of the population. Low back pain is a disabling condition and due to the pain many people have difficulty performing activities of daily life. Thus, Pilates becomes one of the methods of choice in the treatment of low back pain because it brings muscle strengthening exercises that positively impact the stabilization of the spine. The objective of this study was to review the impact of the Pilates method on pain in patients with low back pain.

METHODS: This is a systematic review, with search for data in the Scielo, OVID, Lilacs, Pubmed and PEDro databases, which included randomized clinical trials that addressed the Pilates method in patients with low back pain. The following search descriptors were used: low back pain, Pilates method, exercise movement techniques. The Boolean operators were: “and” and “or”.

RESULTS: Of the 8 selected studies, all obtained positive results in the reduction of low back pain, each using a different protocol associated with physical therapy treatment. Of the eight studies considered eligible, only seven were included. For the study of this comparison, a random model was used ($I^2=92\%$, $df=6$, $p=0.01$), in which there was a statistically significant difference between the Pilates and control groups (95% CI -1.79, -0.19).

CONCLUSION: It was possible to conclude that the Pilates method he was effective in the treatment of low back pain.

Keywords: Exercise movement techniques, Low back pain. Pain.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A fraqueza dos extensores de tronco é uma das principais causas no desenvolvimento de lombalgia em grande parte da população. A dor lombar é uma condição incapacitante e, devido à dor, muitas pessoas têm dificuldade para realizar as atividades de vida diária. Assim, o Pilates passa a ser um dos métodos de escolha para tratamento de pacientes com lombalgia, pois traz exercícios de fortalecimento muscular que promovem estabilização da coluna vertebral. O objetivo deste estudo foi analisar o impacto do método Pilates na dor de pacientes com lombalgia crônica.

MÉTODOS: Trata-se de uma revisão sistemática com busca de estudos nas bases de dados Scielo, OVID, Lilacs, Pubmed e PEDro incluindo ensaios clínicos randomizados que abordaram o método Pilates em pacientes com lombalgia crônica inespecífica. Os descritores de busca utilizados foram *low back pain*, *Pilates method*, *exercise movement techniques*, somados aos operadores booleanos: “e” e “ou”. O risco de viés dos estudos foi avaliado de acordo com os critérios da escala PEDro.

RESULTADOS: Dos 8 estudos selecionados, todos obtiveram resultados positivos na redução da dor lombar, cada um utilizando um protocolo diferente associado ao tratamento de fisioterapia. Dos oito estudos considerados elegíveis, apenas sete foram incluídos na meta-análise. Para a meta-análise desta comparação, foi utilizado um modelo randomizado ($I^2=92\%$, $df=6$, $p=0,01$), no qual houve uma diferença estatisticamente significativa entre os grupos Pilates e grupo controle (95% CI -1,79, -0,19).

CONCLUSÃO: Foi possível concluir que o método Pilates foi eficaz no tratamento de dores lombares.

Descritores: Dor, Dor lombar, Técnicas de exercício e de movimento.

INTRODUCTION

It is estimated that at least once in life, 80% of the population will have an episode of low back pain (LBP), and in 40% of these, the pain will become chronic¹. Chronic LBP is a health problem that affects much of the population, reaching a prevalence of 11.9% of inhabitants worldwide. It is noteworthy that chronic LBP is a disabling condition, generating high absenteeism from life activities².

LBP has a multifactorial etiology, such as: age, gender, smoking, alcoholism, body weight, social class, and work activities³. The literature believes that the imbalance between the function of the trunk flexor and extensor muscles increases the probability of developing disorders that affect and impair the stability of the lumbar spine⁴. Study⁵ proves that the work of strengthening the

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HIGHLIGHTS

- The study reinforces the importance of the Pilates method for patients with low back pain, focusing on pain reduction, but with an impact on functionality and quality of life.
- The role of Pilates as an integral part of a care protocol is also reinforced, not as the only tool for physical therapy care.
- The application of Pilates method should begin with exercises of mild to moderate difficulty and, with functional gain, progress to high complexity.

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trunk extensors (lumbar square, multifidus, semispinatus, spine erector and interspinal) is the main responsible for reducing the symptoms of LBP, since there is considerable improvement in the stabilization of the lumbar spine.

The Pilates method is an exercise program often prescribed for these individuals, as it is used to activate and strengthen the stabilizing muscles of the trunk⁴. This method is divided into two principles: the basic, which includes an exercise program that strengthens the abdominal and paravertebral muscles, such as the spine flexors; and the intermediate/advanced principle. Trunk extension exercises are gradually introduced and both include exercises for the whole body⁵.

Pilates can stimulate circulation, improve physical conditioning, increase flexibility and muscle range, improve postural alignment, increase levels of body awareness and improve motor coordination. Such benefits help prevent injuries and provide relief from chronic pain¹.

It was recently discovered by physiotherapists and orthopedists that this method can be used as a rehabilitation exercise, bringing quick and effective results⁶. It incorporates movement principles that include physical and cognitive elements: full-body movement, attention to breathing, balanced muscle development, concentration, control, centering, precision and rhythm⁷. Therefore, this method can be effective to improve general health, such as athletic performance, proprioception and pain reduction in patients with LBP².

Pilates may be indicated for the treatment of non-specific LBP⁸. Pilates training also shows effective evolution in static and dynamic balance, in addition to strengthening the lower and upper limbs, center control, breathing work, hip and lumbar flexibility and cardiovascular endurance⁹.

Recently, the literature brought evidence of the Pilates method on pain in patients with chronic musculoskeletal conditions, especially the seniors. The present review seeks to bring evidence related to Pilates in patients with LBP, without age restriction. Others authors^{10,11} have already published about Pilates on LBP, however, nine years after this publication, there is a need for an update on the subject. Given the above, the aim of the study is to review the impact of the Pilates method on pain in the treatment of patients with LBP.

METHODS

This systematic review was completed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, and the study's guiding question was: "What are the effects of the Pilates method on pain for low back pain"? The survey was structured based on the PICO tool (Table 1)¹². The study was registered with the International prospective register of systematic reviews (PROSPERO) under number CRD42021228049.

The following databases were systematically searched: PubMed, Scielo, PEDro (Physiotherapy Evidence Database), OVID and LILACS (Latin American and Caribbean Health Sciences). MeSH terms used were: "low back pain" and "exercise movement techniques", in these already related words, and the key-

Table 1. PICO's research strategy.

Acronym	Description	Definition
P	Patient	Patients with chronic low back pain
I	Intervention	Pilates method
C	Control	Patients who received another type of intervention other than Pilates method, such as electrotherapy, manual instructions through leaflets and joint mobilization.
O	Outcome	Pain

word "Pilates method" was also used. Boolean operators "AND" and "OR" were added, according to the Medical Subject Headings (MeSH) (Table 2). The study was conducted from March to April 2020.

Table 2. Search strategy in Pubmed data library.

#1 Backache "back pain" [MeSH Terms] OR ("back" [All Fields] AND "pain" [All Fields]) OR "back pain" [All Fields] OR "backache" [All Fields] OR "backaches" [All Fields]
#2 ("pilates" [All Fields] OR "pilates" [All Fields]) AND ("methods" [All Fields] OR "methods" [MeSH Terms] OR "methods" [All Fields] OR "method" [All Fields] OR "methods" [MeSH Subheading])
#3 "exercise movement techniques" [MeSH Terms] OR ("exercise" [All Fields] AND "movement" [All Fields] AND "techniques" [All Fields]) OR "exercise movement techniques" [All Fields]

Inclusion and exclusion criteria

The selected studies were randomized clinical trials that addressed the Pilates method when applied to patients with chronic nonspecific LBP, without restriction of language or year of publication. Studies that addressed other diseases, that related LBP to pregnancy and that used surgical treatment for LBP were excluded.

Methodological quality assessment

Methodological quality of the studies was assessed according to the criteria of PEDro scale, which scores 11 items, namely: 1 - Eligibility criteria, 2 - Random allocation, 3 - Hidden allocation, 4 - Baseline comparison, 5 - Blinded individuals, 6 - Blind therapists, 7 - Blind evaluators, 8 - Adequate follow-up, 9 - Intention to treat the analysis, 10 - Comparisons between groups, 11 - Point estimates and variability. Items are scored as present (1) or absent (0), generating a maximum sum of 10 points, with the first item not counting. PEDro is a specific database for studies investigating the effectiveness of interventions in physical therapy and can be accessed free of charge through the website <www.pedro.org.au>¹³.

Data extraction

Searches performed in the databases followed three steps, which included: search of titles, abstracts and complete reading of the articles in order to extract data, carefully analyzing each part that composes them, such as: author, title, abstract, journal, year and conclusions, thus making it possible to filter the most relevant information for final research.

Selection and data extraction of the articles were performed by two independent reviewers. When there was disagreement bet-

ween them, both reread the article for re-examination. If disagreement remained, a third independent reviewer would analyze and decide. The research followed the PRISMA 2020¹⁴ protocol items for systematic reviews.

RESULTS

A total of 190 articles were found, 37 in Scielo, 80 in LILACS, 74 in Pubmed and 13 in PEDro. Only 14 scientific articles were selected after reading the titles and abstracts. The other six articles were excluded for the following reasons: one did not include LBP as the focus, one did not address Pilates as the main form of treatment, one literature review, one non-randomized study, one case report and one study that had no control group. The figure 1 demonstrates all the criteria and databases used to select the articles.

In the assessment of methodological quality with PEDro scale, the scores of five articles were already available in PEDro database^{15,16,19-22} and the two articles^{17,18} were evaluated by two independent reviewers as the scores were not yet available. Scores ranged from 6 to 7 points on a scale of zero to 10 points (Table 3). All studies lost points in items related to blinding the patient and therapist, and only two studies^{17,21} blinded the evaluator.

Eight studies¹⁵⁻²² were considered eligible for this review. Table 4 shows the details of the studies and interventions.

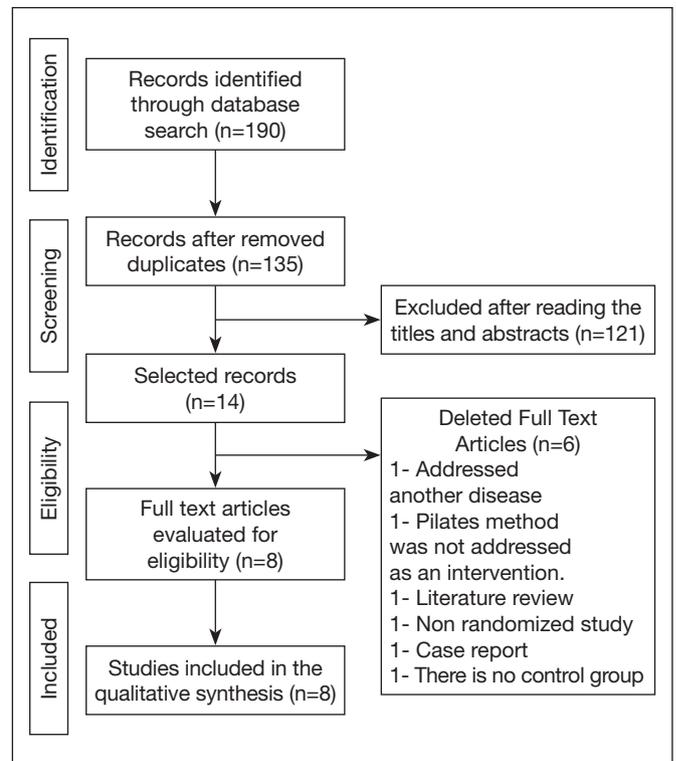


Figure 1. Flowchart for obtaining randomized clinical trials

Table 3. Assessment of the methodological quality of the studies included in this review using the PEDro Database scale

	Silva et al. ¹³	Rydeard, Leger and Smith ¹⁴	Díaz et al. ¹⁵	Cruz-Díaz et al. ¹⁶	Valenza et al. ¹⁷	Miyamoto et al. ¹⁸	Bhadoria and Gurudut ¹⁹	Natour et al. ²⁰
01 Eligibility criteria have been specified.								
02 Subjects were randomly assigned to groups.	Y	Y	Y	Y	Y	Y	Y	Y
03 Subject allocation was secret.	Y	Y	Y	Y	Y	Y	Y	Y
04 Initially, the groups were similar with respect to the most important prognostic indicators.	Y	Y	Y	Y	Y	Y	Y	Y
05 All subjects participated blindly in the studies.	Y	Y	Y	Y	Y	N	Y	Y
06 All therapists who administered therapy did so blindly.	N	N	Y	Y	Y	N	N	N
07 All evaluators who measured at least one key outcome did so blindly.	N	Y	N	Y	Y	Y	N	N
08 Measurements of at least one key outcome were obtained in more than 85% of subjects initially distributed among groups.	N	Y	N	N	N	Y	N	N
09 All subjects from whom outcome measures were presented received the treatment or control condition according to allocation, or when this was not the case, data analysis was performed for at least one of the key outcomes by "intention of treatment".	Y	Y	Y	Y	Y	Y	Y	Y
10 The results of the inter-group statistical comparisons were described in at least one key result.	N	Y	N	N	N	Y	Y	N
11 The study presents both precision measures and variability measures for at least one key outcome.	N	N	N	N	N	N	N	Y
Score	6/10	8/10	6/10	7/10	7/10	7/10	6/10	6/10

Table 4. Characteristics of the studies.

Authors	Sample size	Gender	Duration of symptoms	Age	Intervention	Control	Measurements	Results
Silva et al. ¹⁵	16 IG: 8 CG: 8	CG: 7 women and 1 man; IG: 7 women and 1 man.	Greater than 24 months in both groups.	CG: 44.87±11.07 years; IG: 47±8.48 years	Nine postures of the Pilates method.	Conventional stretching and strengthening of the lumbar spine and lower limbs.	Visual analog scale (VAS) and the Oswestry Disability Index Questionnaire (ODI).	ODI questionnaire and pain in the pre and post moments between the groups did not present significant statistical difference.
Rydeard, Leger and Smith ¹⁶	39 IG: 18 CG: 21	CG: 13 women and 6 men; IG: 8 women and 6 men.	More than 8 symptoms of 8.2 years.	CG: 34 ± 8 years; IG: 37 ± 9 years.	Pilates on gadgets.	Did not receive specific physical training and continued with the usual care.	The Roland Morris Disability Questionnaire (RMQ/RMDQ-HK) and average pain intensity using a 101-point numerical rating scale.	There was a significantly lower level of functional disability (p=0.023) and average pain intensity (p=0.002) in the specific-exercise-training group than in the control group following the treatment intervention period.
Cruz-Díaz et al. ¹⁷	97 CG: 47; IG: 50.	CG: 47 women and 50 men; IG: 53 women.	>6 weeks in both groups.	CG: 71.14 ± 3.30; IG: 71.14 ± 3.30.	In addition to the CG treatment, the sample received two sessions a week of Pilates exercises.	The treatment consisted of the application of Transcutaneous Electrical Stimulation, massage and stretching of the lumbar region.	Fear of falling (FoF), assessed by the Falls Efficacy Scale-International; functional mobility and balance, measured with the Timed up and Go Test; and pain, evaluated using the numeric rating scale.	Only the Pilates group showed improvement in FoF (d=0.68) and functional mobility and balance (d=1.12) after treatment, and had better results in pain (d=1.46) than the physiotherapy-only group.
Cruz-Díaz et al. ¹⁸	101 CG: 48; IG: 53.	CG: 48 women and 53 men; IG: 53 women.	>6 weeks in both groups.	CG: 72/69 ± 3.532; IG: 69.57 ± 2.188;	Application of traditional Pilates principles with 1 hour sessions for 6 weeks.	Application of analgesics, electrotherapy and joint mobilization.	Pain and disability were measured by VAS and the ODI.	Were significant differences between groups in pain and disability after 6 weeks of treatment, with better results in the PPT group with an effect size of d=3.14 and d=2.33 for pain and disability.
Valenza et al. ¹⁹	54 CG: 27; IG: 27.	CG: 22 men and 5 women; IG: 25 men and 2 women.	CG: 15.1 ± 6.5 months; IG: 13.9 ± 4.4 months.	Floor exercises using a 55 cm ball on a rubber mat with 45-minute sessions for 8 consecutive weeks.	Usual activities and received advice in the form of a leaflet.	RMDQ and ODI, current, average and pain at its least and at its worst (Visual Analogue Scales), lumbar mobility (modified Shober test), flexibility (finger-to-floor test) and balance (single limb stance test).	RMDQ (mean change ± standard deviation of 5.31±3.37 and 2.40±6.78 respectively) and between-groups mean difference of 3.2±4.12, p=0.003) and the ODI (p<0.001), current pain (p=0.002) and pain at its least (p=0.033), flexibility (0.032) and balance (0.043).	Improvements were observed in pain (mean difference=2.2 points, 95% confidence interval [CI]=1.1 to 3.2), disability (mean difference=2.7 points, 95% CI=1.0 to 4.4)
Miyamoto et al. ²⁰	86 CG: 43; IG: 43.	CG: 34 women and 9 men; IG: 36 women and 7 men	Duration of symptoms greater than or equal to 7 months.	CG: 38 ± 11.4; IG: 41 ± 12	Intervention of exercises in the Pilates method of flexibility and strengthening.	Re-education follow-up with books and non-practice physiotherapeutic explanations. They had meetings with the physiotherapist twice a week to clarify doubts.	Pain intensity and disability.	
Bhaduria and Gurudut ²¹	44 CG: 22; IG: 22.	CG: 18 women and 4 men; IG: 22 women	Duration of symptoms >3 months.	CG: 32.75 ± 11.73; IG: 21.78 ± 2.87	Performed lumbar stabilization and strengthening exercises.	A Pilates exercise protocol was used, encompassing strengthening, stretching, flexibility and treatment with electrostimulation.	Pain was assessed by visual analog scale, functional affection by modified ODI.	Pain was found to be significantly reduced in the lumbar stabilization group with p-value of 0.0001 compared to dynamic strengthening exercise.
Naturet al. ²²	60 CG: 30; IG: 30.	CG: 18 women and 12 men; IG: 23 women and 7 men	Duration of symptoms <10 months.	CG: 44.83 ± 17.40; IG: 37.54 ± 13.80	Patients using anti-inflammatory drugs without exercise intervention.	50-minute classes being held twice a week working on strengthening, stretching, flexibility and isometric exercises.	Pain and function (Roland Morris questionnaire).	Statistical differences favoring the EG were found with regard to pain (p<0.001), function (p<0.001)

CG = Control Group; IG = Intervention Group; CI = Confidence Interval; d = Cohen's

Comparison of the Pilates method with other interventions for the outcome of pain

Eight studies¹⁵⁻²² evaluated pain before and after the intervention (n=497) and the study¹⁷ did not have pain as an outcome. One study³ compared the Pilates method with conventional kinesiotherapeutic exercises, such as conventional stretching and strengthening of the lumbar spine and lower limbs (n=16); the following exercises of the Pilates method were performed: breathing with transverse abdomen activation, in addition to the following postures: spine stretch, the spine twist, the hundred, the one leg circle, the plank, leg pull front, swimming, rocking and swan. In total, 12 sessions were held, twice a week, lasting 40 minutes and performed individually.

The study¹⁶ compared the Pilates method with defined usual care, such as consulting a physician and other specialists and health professionals as needed (n=39). The Pilates group received a treatment protocol consisting of training in specialized apparatus (Pilates) in the clinic for three sessions of 1 hour per week and training in a 15-minute home program, performed 6 days a week for 4 weeks. The apparatus used in the clinic consisted of a floor mat and a Pilates Reformer with a standing platform and accessories for jumping boards.

The study¹⁷ compared the conventional physical therapy intervention of the control group with Pilates exercises (n=97). The Pilates group received the control group treatment plus two sessions per week of Pilates exercise. The control group performed Transcutaneous Electrical Stimulation, massage and stretching of the lumbar region.

The study¹⁸ compared the Pilates method with physical agents such as electrical stimulation or manual therapy (n=101). Pilates exercises were performed aiming at strengthening with the use of implements such as fit balls, magic rings and TheraBands; flexibility and joint mobility exercises; breathing exercises; posture control and correction tasks for 6 weeks or conventional physical therapy using analgesics, electrotherapy and joint mobilization.

The study¹⁹ compared the results of Pilates exercises with usual activities and guidance through leaflets (n=54). In the

Pilates method, floor exercises were performed using a 55 cm ball on a rubber mat, including the following exercises: saw, mermaid, unilateral stretch, leg stretch, cross, swan dive, spine twist, unilateral kick, leg kick double, one leg circle, side kick and 3-5 minutes of relaxation progressing at basic, intermediate, and advanced levels. Control group patients continued their usual activities and received advice in the form of a leaflet.

The study²⁰ compared results between the Pilates method applied in practice with theoretical guidelines in the form of a study for postural reeducation (n=86). In the Pilates method group, exercises were applied working on lower back muscle flexibility and strengthening exercises encompassing progression with load and isometry. The control group received guidance and study materials and only worked with theory.

The study²¹ compared the results between groups using the Pilates method and joint mobilization. Joint mobilization was accomplished by activating the powerhouse, which represents isometric contraction. This included finding the neutral spine, breathing practice, engaging pelvic floor and transverse traction. In the Pilates group, both solo Pilates and Pilates with the aid of equipments were applied, working on the patient's pain with strengthening exercises that improve muscle flexibility, giving more conditions to muscle fibers and improving the stabilization of the pelvic floor. In patients who were in more acute pain, electrostimulation as analgesia was applied. In the control group, patients were submitted to a protocol of muscle strengthening and relaxation exercises.

Another author²² compared the Pilates method with the use of antisteroids without exercise intervention. The Pilates group had a protocol applied with stretching, improving muscle flexibility and strengthening, thus improving the capacity of muscle fibers. Strengthening exercises were worked with isometrics and Pilates classes were done twice a week, lasting 50 minutes each. Control group was followed only with the use of antisteroids and postural recommendation. General data for each study are shown in Table 5.

Table 5. Details of study data, in means and standard deviations.

Authors	Sample	Before treatment	After treatment	Six months after randomization	Comparative results
Silva et al. ¹⁵	CG: 8 PG: 8	CG: Pain VAS: 5,75±2,81 PG: Pain VAS: 5,00±2,00	CG: Pain VAS: 3,25±3,37 PG: Pain VAS: 2,00±2,56	---	Statistically significant improvement in pain (p<0.0031)
Rydeard, Leger and Smith ¹⁶	CG: 18 PG: 21	CG: Pain NRS: 30.4 (4.2) PG: Pain NRS: 23.0 (3.9)	CG: Pain NRS: 33.9 (3.5) PG: Pain NRS: 18.3 (3.2)	---	Statistically significant improvement in pain (p< 002)
Cruz-Díaz et al. ¹⁷	CG: 47 PG: 50	Absent	Absent	---	Statistically significant improvement in pain (p<005)
Cruz-Díaz et al. ¹⁸	CG: 48 PG: 53	CG: Pain NRS: 6.48 ± 1.28 PG: Pain NRS: 6.80 ± 0.59	CG: Pain NRS: 5.69 ± 1.63 PG: Pain NRS: 3.81 ± 1.21	---	Statistically significant improvement in pain (p<0.001).
Valenza et al. ¹⁹	CG: 27 PG: 27	CG: Pain VAS: 5.2 ± 1.9. PG: Pain VAS: 5.2 ± 1.9.	CG: Pain VAS: 0.9 ± 2.8 (-0.7 to 2.4) PG: Pain VAS: 2.3 ± 1.9 (1.6 to 3.1)	---	Statistically significant improvement in pain (p< 0.002)
Miyamoto et al. ²⁰	CG: 43 PG: 43	CG: Pain NRS: 5.2(2.3). PG: Pain NRS: 3.1(2.3).	CG: Pain NRS: 2.2(1.1). PG: Pain NRS: 0.9(0.1)	---	Statistically significant improvement in pain (p<.001)
Bhadoria et al. ²¹	CG: 22 PG: 22	CG: Pain NRS: 21.78±2.87 PG: Pain NRS: 24.71±4.55	CG: Pain NRS: 0.31± 0.42 PG: Pain NRS: 0.58± 0.54	---	Statistically significant improvement in pain (p=0.0001)
Natour et al. ²²	CG: 30 PG: 30	CG: Pain NRS: 22.44±4.56 PG: Pain NRS: 22.22±4.74	CG: Pain NRS: 5.79±2.06. PG: Pain NRS: 5.50±1.25.	---	Statistically significant improvement in pain (p<0.001)

CG = Control group; PG = Pilates group; VAS = Visual Analog Scale; NRS = Numerical Rating Scale.

DISCUSSION

Based on the results obtained in this systematic review in all studies, it can be observed that Pilates associated with physical therapy treatment generated a significant reduction in pain. It is important to emphasize the high heterogeneity of the study and the non-use of the assessment of the level of evidence, which may have influenced the results of this review.

The study¹⁵ showed that the Pilates Method is an alternative to conventional methods because it verified that, like Physiotherapy, Pilates is also effective for the treatment of patients with chronic LBP. Study¹⁶ proved that exercise produces a great reduction in pain in these individuals, as it is a resource that plays an important role in the treatment of LBP. Improved posture is a consequence of increased flexibility along with strengthening the core, which is extremely important to maintain the correct spine position²³.

The addition of the Pilates method to the protocol by the authors^{17,18} provided good results in terms of reducing LBP in patients. It was also possible to verify the long-term effectiveness, where it was concluded that benefits remained after one year of treatment. This is justified by the strengthening of the diaphragm, hip flexors, buttocks, perineum musculature and deep erectors of the spine, generating continuous improvement in lumbar stabilization²⁴.

Approaching the treatment in a different way, involving basic Pilates body exercises and breathing control, authors¹⁹ obtained positive differences regarding chronic nonspecific LBP in patients. In addition to an improvement in pain, it was also possible to develop a better postural awareness acquired through exercises that encourage bilateral muscle development and flexibility.

The distinction between the results obtained in the treatments for LBP can be justified by the difference between the treatment programs in terms of duration and protocol used for each group. The authors²⁰ observed a great advantage in short-term treatment with Pilates interventions compared to a posture education treatment without the Pilates Method intervention.

Unlike authors²¹, who state that the Pilates Method is only effective when the dynamic stabilization of the lower back is performed, study²² believe that it is better for patients to perform Pilates than not to practice any type of physical activity. In this method, the stabilization of the lower back is worked through the activation of abdominal muscles, in addition to the guidelines to keep the spine and pelvis neutral.

The present results may have been influenced by the variation in mean age. The Pilates modality was not the same in all articles, alternating between mat Pilates and Pilates with the aid of equipments. There was also heterogeneity in relation to the application time between the articles' protocols. In addition, the absence of GRADE assessment and the high heterogeneity are limitations of this study. From a social perspective, this work signals to the population the benefits and the need to popularize the Pilates method for individuals with LBP. For science, it becomes a propagator of the method, in addition to serving as a basis for further studies on the subject.

This review brings the perspective of the production of new studies with more adequate protocols for this population, presenting homogeneity and allowing the exact understanding of the role of the Pilates method in patients with chronic nonspecific LBP in the short, medium, and long term.

CONCLUSION

With the results obtained in this study, it is possible to conclude that the Pilates method has significantly positive effects in the treatment of lower back pain. The clinician must be careful and prescribe the Pilates method individually.

AUTHORS' CONTRIBUTIONS

André Luiz Lisboa Cordeiro

Statistical analysis, Data collection, Conceptualization, Writing - Review and Editing, Validation

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Data Collection, Conceptualization, Methodology, Writing - Review and Editing, Validation

Natale Sena Cerqueira

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Fernanda Aparecida Ferreira Santos

Data Collection, Conceptualization, Methodology, Writing - Review and Editing

Alberto Manoel Sarkis Oliveira

Conceptualization, Writing - Preparation of the original, Writing - Review and Editing

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