

Impact of Total Hip Arthroplasty on Low Back Pain

Impacto da Artroplastia Total de Quadril na Dor Lombar

Impacto de la Artroplastia Total de Cadera en el Dolor Lumbar

RESUMO

Objetivo: Investigar os efeitos da artroplastia total do quadril sobre a dor lombar em pacientes submetidos ao procedimento e identificar se esse sintoma apresenta redução, agravamento ou estabilidade no período pós-operatório. **Métodos:** Revisão integrativa da literatura nas bases PubMed, Scielo, Embase e Cochrane, sem restrição de idioma ou ano de publicação. Utilizaram-se os descritores em inglês "Low Back Pain" e "Arthroplasty, Replacement, Hip", combinados pelo operador booleano AND. **Resultados:** Dos 151 artigos identificados, 38 foram incluídos na revisão. Os estudos apontaram melhora da dor lombar após a artroplastia total do quadril, com variações quanto à magnitude e ao tempo de acompanhamento. **Conclusão:** Os estudos analisados indicam que a maioria dos pacientes submetidos à artroplastia total do quadril apresentou melhora significativa da dor lombar. Esse resultado pode auxiliar no planejamento terapêutico, considerando a artroplastia total do quadril como uma intervenção que impacta positivamente não só o quadril, mas também a lombalgia.

DESCRIPTORES: Dor Lombar. Artroplastia Total do Quadril.

ABSTRACT

Objective: To investigate the effects of total hip arthroplasty on pre-existing low back pain in patients, assessing whether this symptom decreases, worsens, or remains stable after surgery. **Methods:** An integrative literature review was performed in the PubMed, Scielo, Embase, and Cochrane databases, with no restrictions on language or year of publication. The descriptors "Low Back Pain" and "Arthroplasty, Replacement, Hip" were combined with the Boolean operator AND. **Results:** Of 151 articles identified, 38 met the inclusion criteria. Most studies reported postoperative improvement in low back pain, although the extent and timing of improvement varied. **Conclusion:** Evidence indicates that most patients undergoing total hip arthroplasty experience significant relief of low back pain after surgery. These results may guide therapeutic planning, highlighting the procedure as an intervention that benefits not only hip function but also lumbar symptoms.

DESCRIPTORS: Low Back Pain. Total Hip Arthroplasty.

RESUMEN

Objetivo: Analizar los efectos de la artroplastia total de cadera sobre el dolor lumbar preexistente en pacientes sometidos a este procedimiento, identificando si dicho síntoma disminuye, empeora o se mantiene estable en el posoperatorio. **Métodos:** Se realizó una revisión integrativa de la literatura en PubMed, Scielo, Embase y Cochrane, sin restricciones de idioma ni año. Se emplearon los descriptores en inglés "Low Back Pain" y "Arthroplasty, Replacement, Hip", combinados con el operador booleano AND. **Resultados:** De los 151 artículos identificados, 38 fueron incluidos en la revisión. En general, los estudios informaron mejoría del dolor lumbar tras la artroplastia, con diferencias en magnitud y tiempo de seguimiento. **Conclusión:** La mayoría de los pacientes sometidos a artroplastia total de cadera presentaron una mejoría significativa del dolor lumbar, lo que respalda su consideración como intervención capaz de beneficiar tanto la función de la cadera como los síntomas lumbares.

DESCRIPTORES: Dolor de la Región Lumbar; Artroplastia de Reemplazo de Cadera.

RECEIVED: 09/27/2025 APPROVED: 10/14/2025

How to cite this article: Oliveira LFB, Siqueira CPCM, Cavaguchi AMS. Impact of Total Hip Arthroplasty on Low Back Pain. Saúde Coletiva (Edição Brasileira) [Internet]. 2025 [acesso ano mês dia];16(101):17704-17721. Disponível em: DOI: 10.36489/saudecoletiva.2025v16i101p17704-17721



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INTRODUCTION

Total hip arthroplasty (THA) is one of the most commonly performed surgical procedures in the world and is among the interventions that provide the most benefits to patients. It is considered one of the greatest advances in the treatment of orthopedic diseases, as it promotes faster postoperative recovery and facilitates a return to daily activities⁽¹⁾.

Initially, total hip arthroplasty was indicated only for the elderly or individuals with locomotor limitations associated with other comorbidities⁽²⁾. Currently, although the indications are not yet fully defined, patients with restricted movement, joint pain, radiographic signs of osteoarthritis (OA), or failure of conservative treatment are considered candidates for the procedure⁽³⁾.

Low back pain is characterized by pain or discomfort located between the costal margin and the upper gluteal line, which may radiate to the lower limbs. It is a condition that can affect individuals of all ages and, in more than 90% of cases, is considered nonspecific. Its progression is often related to factors extrinsic to the spine, such as psychological, behavioral, and social aspects^(4,5).

Among adults, the prevalence ranges from 12% to 15%, while in the elderly it can reach 21% to 75%. In patients with severe hip osteoarthritis (OA), this rate ranges from 21.2% to 49.4%. In addition, approximately 6% of individuals with OA undergo total hip arthroplasty (THA) to re-

lieve low back pain, which reinforces the relevance of the interrelationship between these conditions.

Understanding the evolution of low back pain in patients undergoing total hip arthroplasty (THA) is essential, since the origin of this symptom is not always restricted to the spine and may be associated with dysfunctions in adjacent joints, such as the hip. Recognizing these relationships is essential for accurate diagnosis and appropriate therapeutic planning, favoring more assertive clinical decisions. Thus, the present study aimed to conduct an integrative review of the literature to investigate possible changes in low back pain after THA.

MATERIALS AND METHODS

This is an integrative literature review study conducted using a methodological sequence that involved: identification of the research problem; definition of descriptors; search of scientific databases; and selection of articles based on reading the titles/abstracts.

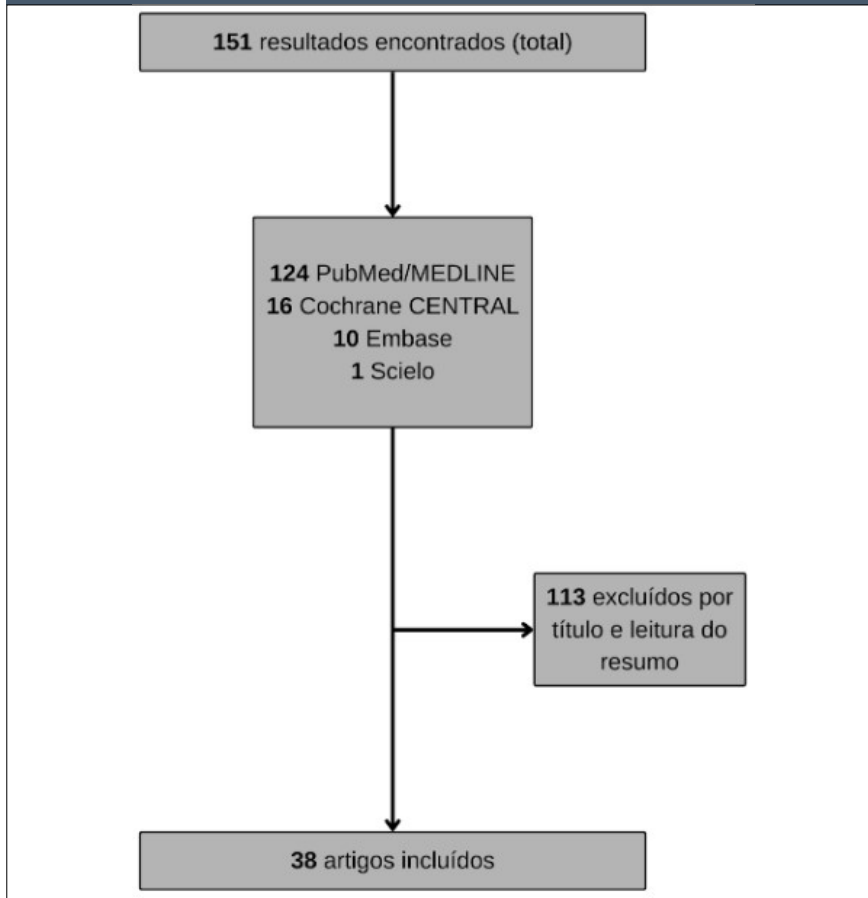
The search was conducted in the PubMed, Scielo, Embase, and Cochrane databases from February to April 2023 and from July to August 2025, considering articles published in any language, with no restriction on the year of publication. DeCS (Health Sciences Descriptors) descriptors were used in conjunction with the Boolean operator AND: (Arthroplasty, Replacement, Hip) AND (Low Back Pain). The search strategy resulted in a total of 151

studies.

Primary and secondary studies addressing low back pain in patients undergoing total hip arthroplasty were included, regardless of age, gender, or country of origin, provided they presented data relevant to the clinical evolution of low back pain after TKA.

Articles that addressed only hip arthroplasty or arthroplasty of other joints, without a direct relationship to low back pain, were excluded. In addition, studies that did not evaluate preoperative low back pain, studies focusing on animal models, duplicate articles, letters to the editor, conference abstracts, and others that did not provide information relevant to the objective of this study were also excluded.

Among the 151 results, 113 articles that were not related to the topic were excluded, although there was no specific descriptor for their exclusion, including the Boolean operator AND NOT. Therefore, a final review was performed, and 38 articles were selected to participate in this study (Figure 1).

Figure 1: Flowchart with the results of the search conducted in PubMed, Scielo, Embase, and Cochrane.

(Figure 1), which are presented in Table 1. In total, 14,146 patients were evaluated, distributed among different research designs: 21 retrospective studies, 13 prospective studies, two case reports, one scoping review, and one systematic review.

In general, the selected articles reported, even as a secondary outcome, that patients who had low back pain before undergoing total hip arthroplasty showed improvement in this symptom during postoperative follow-up. These results were mostly quantified using the Visual Analog Scale (VAS) or, in fewer cases, validated questionnaires for low back pain (such as the Oswestry).

Although low back pain was not resolved in all individuals, all 38 studies showed improvement in this symptom, regardless of the surgical indication. In other words, even though the reasons for performing TTH were diverse, the results related to low back pain remained stable across studies. In addition, other positive outcomes are noteworthy, such as pain reduction, increased hip mobility and function, decreased dependence on walking aids, and improvement in claudication and Trendelenburg sign, factors that justify the continued growth in the choice of this surgical procedure.

RESULTS

After searching the databases, according to the methodological proce-

dures described, 151 articles were initially identified. In accordance with the inclusion and exclusion criteria, 38 studies were selected for the study

Table 1: Table of results for the selected articles.

Author/Year	Título	Follow-up	Type of Study / Conclusion
Lubahn et al (1980)	Conversion of ankylosed hips to total hip arthroplasty	Not specified	Retrospective case series: The study showed that patients with ankylosing spondylitis who underwent total hip arthroplasty experienced improvement in low back pain.
Kilgus et al (1990)	Joint replacement for ankylosed hips	Average of 7 years	Retrospective case series: In this study, patients undergoing THA experienced complete or significant relief from low back pain, as well as improved hip mobility and reduced dependence on walking aids.
Yamada et al (1998)	A case of psoriatic arthritis associated with ankylosing spondylitis treated with bilateral total hip arthroplasty	18 months	Case report: Bilateral cementless total hip arthroplasty with adductor tenotomy resulted in complete pain relief and marked improvement in walking function 18 months after surgery.

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Rodriguez-Merchan et al (1999)	Joint replacement of spontaneously ankylosed hip in a hemophilic patient	4 months	Case reports: The study showed that hip replacement in a hemophilic patient with ankylosing spondylitis resulted in relief of low back pain and correction of limb length discrepancy.
Schäfer et al (2000)	Total hip arthroplasty after hip joint arthrodesis	5.4 years	Retrospective comparative study: The study showed that of 13 patients who had preoperative low back pain, six patients were pain-free, seven had less pain, and two reported no improvement in pain after the procedure.
Nilsdotter et al (2003)	Predictors of patient-relevant outcomes after total hip replacement for osteoarthritis: a prospective study	3, 6, 12 months, and 3.6 years	Prospective case-control study: The prevalence of low back pain in patients decreased from 32% to 21.5%.
Hajnó e Kolman (2004)	Total endoprosthesis replacement after hip joint arthrodesis	Average of 9.3 years	Retrospective case series: In this study, all eight patients who underwent total hip arthroplasty due to persistent pain in the lumbosacral region experienced pain relief or absence of pain.
Schuh et al (2005)	Results and experiences of hip arthrodesis conversion	Average of 6.5 years	Retrospective case series: The study showed that after replacement of the 13 patients with low back pain, seven showed improvement in symptoms.
Ben-Galim et al (2007)	Hip spine syndrome: the effect of total hip replacement surgery on low back pain in severe hip osteoarthritis	3 months and 2 years	Prospective clinical study: The study showed that patients undergoing THR for severe hip osteoarthritis experienced improvement in low back pain, as measured by both the VAS and the Oswestry questionnaire.
Lustig et al (2007)	Total hip arthroplasty after hip arthrodesis performed for septic arthritis	Average of 6 years	Retrospective study: In this study, 83% of patients who had hip arthrodesis for sepsis and low back pain, when undergoing THA, showed significant improvement in low back pain.
van Biezen et al (2007)	Clinical outcomes of total hip arthroplasty after previous hip arthrodesis	Median 5 years	Retrospective study: The study showed that after five years of follow-up in patients who had arthrodesis and underwent replacement for THA due to low back pain, they showed improvement in low back pain.
Li et al (2008)	Effect of total hip arthroplasty on low back pain in unilateral developmental dysplasia of the hip	3 and 24 months	Prospective cohort study: In this study, spinal function and low back pain improved after three months in patients with developmental dysplasia who underwent THA. Two years after surgery, the results remained stable or improved.
Parvizi et al (2010)	Back pain and total hip arthroplasty: a prospective natural history study	6 weeks, 6 months, and 1 year	Prospective prognostic study: Improvement in low back pain was observed in 113 (66.4%) of the 170 patients involved in the study, suggesting that most patients who had hip arthritis and low back pain experienced resolution or improvement of pain after THA.
Hasegawa et al (2012)	Total hip arthroplasty for Crowe type IV developmental dysplasia	Average of 10.2 years	Retrospective case series: The study of 18 patients with Crowe type IV developmental dysplasia showed that the severity of low back pain was significantly reduced after THA.
Lacko et al (2014)	Our experience with the short hip stem meta	Average of 24 months	Prospective comparative clinical study: In this study, patients undergoing total hip arthroplasty (THA) with a short hip stem showed improvement in the mean VAS for low back and thigh pain compared to the preoperative value.
Chimenti et al (2016)	Factors associated with early improvement in low back pain after total hip arthroplasty: a prospective multicenter cohort analysis	6 months	Multicenter retrospective cohort study: The study showed improvement in low back pain for patients who had preoperative low back pain, whether mild, moderate, or severe. In addition, demographic factors such as higher family income, use of health insurance, and education above high school are associated with this improvement.
Eyvazov et al (2016)	Effects of total hip arthroplasty on sagittal spine alignment and static balance: a prospective study in 28 patients	6 months	Prospective clinical study: This study demonstrated improvement in low back pain levels (VAS and ODI) and postural balance in patients with SQC after THA surgery.

Weng et al (2016)	The effect of total hip arthroplasty on spinal-pelvic-leg sagittal alignment and low back pain in patients with severe hip osteoarthritis	1 year	Prospective clinical study: The study showed that 39 patients had low back pain before surgery and that, at follow-up, 17 reported complete resolution, while 22 reported pain relief. Improvements in hip flexion and overall spinal balance may be involved in the mechanism of low back pain relief.
Luo et al (2017)	Uncemented total hip arthroplasty with extended sliding trochanteric osteotomy for high congenital hip dislocation: a retrospective study	Average of 5.7 years	Retrospective study: This study demonstrated that low back pain was significantly relieved after THA in patients with congenital hip disease, and this benefit is due to the decrease in limb length discrepancy.
Wang et al (2017)	Subtrochanteric shortening osteotomy during cementless total hip arthroplasty in young patients with severe developmental hip dysplasia	3, 6, 12 weeks, and 6 months	Retrospective study: The study showed that patients undergoing cementless total hip arthroplasty combined with subtrochanteric osteotomy experienced improvement in low back pain.
Eguchi et al (2018)	Spinopelvic alignment and low back pain after total hip arthroplasty in patients with severe hip osteoarthritis	6 months and 1 year	Retrospective study: The study improved the VAS for low back pain, in addition to improving lumbar scoliosis in cases of unilateral OA. It was suggested that the mechanism of improvement in low back pain after THA is related to the compensatory improvement of lumbar scoliosis.
Piazzolla et al (2018)	Changes in spinopelvic parameters and improvement in low back pain due to femoral neck anteversion in patients with severe unilateral primary hip osteoarthritis undergoing total hip arthroplasty	6 months	Prospective clinical study: Patients with unilateral hip OA and low back pain had marked femoral neck anteversion and spinopelvic misalignment. After TKA, pain relief in the hip and lumbar region and changes in spinopelvic parameters were observed.
Yang et al (2019)	Results after total hip arthroplasty using a cementless S-ROM modular stem for patients with high hip dislocation secondary to pyogenic arthritis of the hip	Average of 8.7 years	Retrospective study: In this study, the visual analog scale score for low back pain, the health survey questionnaire score, claudication, and Trendelenburg sign improved significantly.
Zeng et al (2019)	Mid-term results of total hip arthroplasty in patients with hip dislocation after suppurative arthritis of the hip	6.4 years	Retrospective observational study: It was observed that pain in the limbs and lumbar region, limb length discrepancy, and health-related quality of life improved markedly after THA.
Can et al (2020)	Spinopelvic alignment does not change after bilateral total hip arthroplasty in patients with Crowe type IV bilateral developmental dysplasia of the hip	24 months	Prospective longitudinal observational study: Restoration of hip function with ATQ has been shown to improve hip-related low back pain. ATQ in patients with bilateral Crowe type IV hips relieves hip pain as well as associated low back pain. Changes in IP and PT are observed; this improvement may play a role in relieving low back pain.
Ye et al (2020)	Short- and medium-term follow-up study on changes in pelvic spine parameters in patients with hip-spine syndrome after total hip arthroplasty	21 to 52 (32 ± 8) months	Prospective longitudinal observational study: The study showed a decrease in VAS for low back pain, hip pain, and better results on the Oswestry questionnaire after THA. In addition, coronal, spine, and pelvic balance parameters improved significantly in the short and medium term.
Grappiolo et al (2021)	Conversion of hip fusion to total hip arthroplasty: long-term clinical and radiological results	Average of 13.0 ± 6.2 years	Prospective longitudinal observational study: The study showed that conversion of hip arthrodesis to total hip arthroplasty significantly improved low back pain.
Ma et al (2021)	A study of low back pain and changes in sagittal spine parameters after total hip arthroplasty in patients with Crowe IV unilateral developmental dysplasia of the hip	1 year	Retrospective observational study: In this study, in the group with low back pain, pain improved to varying degrees one year after the operation, with 13 patients (81.3%) experiencing complete remission of low back pain.
Ran et al (2021)	Lumbar pain relief after total hip arthroplasty in patients with hip osteoarthritis and lumbar degenerative disease	44.3 months	Retrospective observational study: They observed a decrease in lumbar VAS in the postoperative period of unilateral or bilateral THA, compared to the preoperative period, showing that THA can relieve low back pain while relieving hip pain and restoring function.
Saiki et al (2021)	Effect of changes in spinal alignment on lumbar pain in patients treated with total hip arthroplasty for hip osteoarthritis	12 months	Prospective observational study: Before surgery, 26 patients had low back pain. After surgery, 14 showed improvement according to the VAS.

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Waibel et al (2021)	Symptomatic discrepancy in leg length after total hip arthroplasty is associated with new onset of low back pain	5 years	Retrospective observational study: The study showed that symptomatic leg length discrepancy after TTH is associated with the reappearance of low back pain, regardless of the anatomical length of the legs.
Okuzu et al (2022)	Preoperative factors associated with improvement in low back pain after total hip arthroplasty in a Japanese population	1 year	Retrospective observational study: In this study, 62.9% of patients with low back pain before THA showed improvement in pain. Sagittal spinal imbalance and elevated Cobb angle were the main spinal factors associated with persistent low back pain.
Pourahmadi et al (2022)	Spinopelvic alignment and low back pain after total hip arthroplasty: a scoping review	Not available	Scope review: Improvement in low back pain was observed after THA. The authors suggested that the improvement may be related to compensation for lumbar scoliosis.
Vigdorchik et al (2022)	Does low back pain improve after total hip arthroplasty?	1 year	Retrospective observational study: In this study, 82% of patients with unilateral hip osteoarthritis undergoing THA experienced a decrease in low back pain.
Jia et al (2023)	Medium-term improvement in low back pain after total hip arthroplasty in 306 patients with developmental dysplasia of the hip	5 years	Retrospective observational study: The study showed that THA is reliable for relieving low back pain in patients with unilateral Crowe III and IV developmental dysplasia of the hip; however, in patients with unilateral Crowe I, Crowe II, and bilateral DDQ hips, improvements in low back pain were limited.
Okamoto et al (2023)	Clinical significance of relative pelvic version measurement as a predictor of low back pain after total hip arthroplasty	Average of 2 years	Retrospective case-control study: The study showed that there was improvement in low back pain after ATQ and that moderate to severe pelvic retroversion was significantly associated with low back pain after ATQ.
Okuzu et al (2024)	How do spinal parameters change in patients who experience improvement in low back pain after total hip arthroplasty? A propensity score-matched cohort study.	1 year	Cohort study: In this study, of the 261 patients included, 161 showed improvement in low back pain. In addition, these patients showed significant differences in changes in spinal parameters.
Esmaeili et al (2024)	Total hip arthroplasty in patients with Crowe type IV developmental hip dysplasia: a systematic review	Not available	Systematic review: Low back pain was significantly reduced after THA in patients with Crowe type IV developmental hip dysplasia.

Source: Prepared by the authors, 2025.

DISCUSSION

Total hip arthroplasty (THA) is a widely used procedure in the treatment of osteoarthritis (OA), with consistent results in pain reduction and functional recovery⁽⁴⁰⁾. Although OA is the main indication, the findings of this and other studies indicate that THA also contributes to the improvement of low back pain, highlighting the functional relationship between the hip and the spine.

The prevalence of low back pain among patients undergoing THR ranged from 21.2% to 60.4%, and most studies revealed that half of

THR candidates have some degree of low back pain, showing the relevance of this interrelationship.

For analysis purposes, the study results were classified according to follow-up time: short term (up to 12 months), medium term (1 to 5 years), and long term (over 5 years), based on clinical criteria used in orthopedic studies, allowing for the evaluation of the evolution of low back pain and joint function in different postoperative phases.

Short term

In the first 12 months after total hip arthroplasty, several studies have shown significant improvement in

low back pain. Initial changes in the sagittal alignment of the spine, such as a decrease in excessive lumbar lordosis and correction of sacral tilt, may also contribute to early symptom relief^(6, 29, 30, 36, and 37).

Medium term

At intermediate follow-up, THA maintained its beneficial effects on low back pain. However, some patients continued to experience low back pain related to the presence of moderate to severe pelvic retroversion associated with post-ATQ low back pain⁽⁴³⁾. These findings reinforce that, even in the medium term, biomechanical and individual factors can

modulate the evolution of symptoms, highlighting the need for follow-up.

Long term

In the long term, ATQ showed satisfactory results in reducing low back pain, especially in patients with hip dislocation secondary to suppurative arthritis⁽¹⁷⁾, and in hip function in active young people undergoing surgery for dislocation secondary to pyogenic arthritis⁽³¹⁾. Long-term follow-up studies have indicated that improvement in low back pain was associated with a decrease in lower limb length discrepancies, while the persistence of these length differences may contribute to the persistence of low back pain^(27, 32, 38).

The main reason for the improvement in low back pain in patients undergoing total hip arthroplasty is still unclear, but there is a proven relationship with biopsychosocial factors. Studies indicate early improvement in low back pain in the postoperative period in patients with higher income, who have health insurance and com-

plete schooling, which highlights the influence of these factors.

Some studies have shown that the reduction in scoliosis provided by TKA may be the mechanism associated with the improvement in low back pain^(32, 43). Other authors have observed that relief from low back pain may be associated with improvement in parameters such as sacral inclination, lumbar lordosis, and sagittal axis in the postoperative period^(33, 39). In cases of conversion from arthrodesis to TTA, previous low back pain also tends to improve^(16, 19, 22, 28).

Despite the positive results, much of the literature consists of retrospective studies and case reports, with methodological limitations such as selection bias and reduced control of variables. Few robust prospective studies or high-quality systematic reviews are available. Thus, future studies with prospective designs, larger samples, and rigorous methodologies are needed to provide more reliable evidence on the relationship between TKA and low back pain, as well as

the mechanisms involved in low back pain relief, offering greater safety to clinical practice.

CONCLUSION

The improvement in low back pain promoted by total hip arthroplasty, evidenced in this study, may reduce the need for lumbar surgery, which shows the importance of professionals being aware of this information. However, the recurrence of postoperative pain and the mechanisms involved in improvement are not yet fully understood, indicating the need for further studies.

Therefore, despite the positive results of THA, conservative treatment remains the first option for both hip osteoarthritis and low back pain, highlighting the importance of evaluation by a specialized physical therapist and follow-up by a multidisciplinary team to optimize decision-making.

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