REVIEW ARTICLE (META-ANALYSIS)

Therapeutic Exercise is Effective in Reducing the Intensity of Nonspecific Low Back Pain in Children and Adolescents: A Systematic Review and Network Meta-analysis

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Abstract

Objective

To compare the different physiotherapy treatments and determine the most effective treatment to reduce the nonspecific low back pain (NSLBP) intensity in children and adolescents.

Data Sources

Eight databases (Cochrane Library, MEDLINE, PEDro, Web of Science, LILACS, IBECS, PsycINFO, and SCOPUS), and 2 health-specialized journals (*BMJ* and *Spine*) were searched from inception to May 2023, with no language restriction.

Study Selection

Individuals aged 6-18 years with NSLBP were selected, and physical therapy treatments were considered. Studies were required to be controlled by clinical trials with pretest and posttest evaluations, and to report pain intensity.

Data Extraction

Data extraction and risk of bias assessment were performed independently by 2 reviewers.

Data Synthesis

A meta-analysis of 11 controlled trials with 827 participants found that physiotherapy treatments effectively reduced NSLBP intensity on posttest measurement (d_+=0.75; 95% confidence interval [CI], 0.30-1.20) and 6-month follow-up (d_+=0.35; 95% CI, −0.72 to 1.40). Network meta-analysis showed both therapeutic exercise (d_+=1.11; 95% CI, 0.48-1.74) and a combination of therapeutic exercise and manual therapy (d_+=1.45; 95% CI, 0.40-2.49) were effective compared to no treatment. There were no significant differences between therapeutic exercise and the combination of therapeutic exercise and manual therapy.

Conclusions

Physical exercise has proven to be the most effective treatment for addressing the intensity of NSLBP in children and adolescents. While combining it with manual therapy may yield even better results, it is crucial to emphasize that physical exercise should serve as the cornerstone in the physiotherapeutic approach to managing NSLBP intensity in this age group.

Introduction

In recent years, an increase in the prevalence and severity of low back pain (LBP) in children and adolescents has been observed,[1] reaching about 39% of lifetime prevalence,[2,3] rising to 73.6% in some studies.[4] Furthermore, LBP in adolescence is associated with LBP in adulthood.[1] The effects of LBP may lead to activity limitations and restricted social participation, with an emphasis on school absenteeism and gym or sports participation,[2] and this is considered a concern that needs to be addressed.[1] Nonspecific LBP (NSLBP) is the most common form of LBP, as the specific cause is rarely identified.[5,6]

Physiotherapists employ a variety of modalities to treat NSLBP in children and adolescents. Among them, therapeutic exercise stands out as a well-studied and highly recommended treatment to control the intensity and disability of NSLBP in all age groups.[7] In addition, education emerges as a valuable tool to reduce the intensity of NSLBP in children and adolescents.[8] The combination of exercise and education is advocated, as the synergistic benefits outweigh those achieved when these interventions are employed individually in all age groups.[9] In addition, manual therapy is another effective intervention employed by physical therapists to alleviate the intensity of NSLBP in all age groups.[10] Some researchers propose the involvement of parents or caregivers in the patient's treatment as a beneficial approach.[11]

There is a large difference between the research activity in the treatment of NSLBP in children and adolescents and in adults.[12] In adults, the various therapeutic approaches for NSLBP have undergone extensive examination, resulting in the formulation of clinical

practice guidelines. In contrast, insufficient information is available for children and adolescents, making it difficult to develop corresponding clinical guidelines for NSLBP in this demographic group.[13] In recent years, a guideline has been published on the treatment of back pain in children and adolescents, but not specific to NSLBP.[14] Therefore, substantial uncertainty remains as to which treatment option should be preferred for NSLBP.

Network meta-analysis (NMA) is a statistical technique that allows the results of more than 2 interventions to be compared.[15,16] This method has been used in systematic reviews on the effectiveness of interventions aimed at reducing NSLBP intensity in adults[17,18] but not in children and adolescents.

Given these considerations, updating the knowledge base is essential, as a considerable amount of time has passed since the last meta-analysis, during which new clinical trials have been published. Furthermore, no NMA has been conducted in this field and population, which suggests that this new analysis could offer insights not captured by traditional meta-analyses.[16]

Therefore, this study aimed to investigate whether physiotherapy treatment could decrease the intensity of NSLBP in children and adolescents and to determine the most effective treatments to achieve this outcome.

Section snippets

Methods

The current meta-analysis was carried out following the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement guidelines in the NMA extension[19] and registered with PROSPERO (CRD42021267640).

Results

The search strategy collected 25,696 results (fig 1). After removing duplicates, 20,227 were screened by title and abstract, from which 28 were rated as potentially relevant papers. The articles that were excluded after a review of the body are listed in supplemental appendix S3, with the reasons for exclusion. Finally, 11 studies were included in the meta-analysis.35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45

Discussion

A systematic review with pairwise and NMA was conducted to compare different physiotherapy treatments on the intensity of NSLBP in children and adolescents. In the past decade, both systematic reviews about spinal manual therapy in pediatric patients[46,47] and traditional meta-analyses about physical therapy treatments in NSLBP in children and adolescents[48,49] without follow-up analysis had been published. Since then, several new primary studies have been published. This is the first NMA

Conclusion

Therapeutic exercise has been proven to be effective, and it is recommended that physical therapists prioritize therapeutic exercise as the cornerstone of their treatment approach for reducing pain intensity in cases of NSLBP in children and adolescents. Among therapeutic exercises, lumbar strengthening and stretching exercises are widely recognized as the most common and beneficial.

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Ethical approval

Not applicable.

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