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Short Article

The Preventive Role of Regular Physical Activity in Non-Specific Low Back Pain Among Physically Active Adults – A Literature Review

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Abstract

Background.

Non-specific low back pain (NSLBP) is one of the most prevalent musculoskeletal disorders and a leading cause of disability among adults worldwide. Although physically active individuals are generally considered healthier, they remain susceptible to NSLBP, particularly when training loads are improperly managed or recovery is insufficient. Contemporary clinical guidelines increasingly emphasize non-pharmacological approaches, especially physical activity, as a cornerstone of NSLBP prevention.

Aim.

The aim of this narrative literature review was to evaluate the preventive role of regular physical activity in non-specific low back pain, with particular emphasis on physically active and recreationally active adults.

Materials and Methods.

A narrative review of the literature was conducted using the PubMed and Scopus databases. Peer-reviewed articles published between 2015 and 2024 were analyzed, including systematic reviews, meta-analyses, randomized controlled trials, and international clinical guidelines. Studies focusing on specific spinal pathologies or postoperative populations were excluded.

Results.

The analyzed evidence consistently indicates that regular physical activity is associated with a reduced risk of NSLBP onset and recurrence. Aerobic exercise, resistance training, and core stabilization programs were shown to improve spinal stability, functional capacity, and quality of life, while reducing pain-related disability. Multimodal exercise programs demonstrated the most favorable preventive outcomes.

Conclusions.

Regular physical activity plays a crucial role in the prevention of non-specific low back pain among physically active adults. Appropriately prescribed aerobic exercise, resistance training, and core stabilization exercises should be incorporated into preventive strategies aimed at reducing the burden of NSLBP.

Keywords: non-specific low back pain; physical activity; exercise; prevention; musculoskeletal health.

1. Introduction

Low back pain (LBP) represents a major global health challenge and is consistently ranked among the leading causes of years lived with disability worldwide [1]. Epidemiological data indicate that the vast majority of LBP cases - approximately 85–90% - are classified as non-specific, meaning that no identifiable structural pathology can be established [2]. Despite advances in diagnostic imaging and therapeutic interventions, the overall prevalence of NSLBP has remained largely unchanged. Physically active and recreationally active adults constitute a distinct population in which NSLBP may result not only from sedentary behavior, but also from inappropriate training intensity, insufficient recovery, suboptimal movement patterns, or inadequate neuromuscular control. Historically, physical exertion was often regarded as a potential risk factor for spinal disorders. However, contemporary evidence challenges this paradigm and increasingly supports the protective role of regular, well-structured physical activity in maintaining spinal health [3].

Current international guidelines consistently recommend non-pharmacological approaches as the foundation of NSLBP prevention, with physical activity playing a central role [4]. Despite the growing number of studies addressing exercise-based interventions for low back pain, relatively few reviews have focused specifically on the preventive role of physical activity in physically active and recreationally active adults. Therefore, a synthesis of current evidence in this population is warranted.

2. Aim of the Study

The primary aim of this literature review is to evaluate the preventive role of regular physical activity in non-specific low back pain among physically active and recreationally active adults.

Secondary objectives include the identification of effective exercise modalities and the comparison of recommendations from international clinical guidelines.

3. Materials and Methods

A narrative review of the literature was conducted using the PubMed and Scopus databases. Peer-reviewed articles published between 2015 and 2024 were considered, with priority given to systematic reviews, meta-analyses, randomized controlled trials, and international clinical guidelines. Search terms included combinations of “non-specific low back pain,” “physical activity,” “exercise,” and “prevention.” Studies focusing on specific spinal pathologies, postoperative populations, or pediatric cohorts were excluded. Only articles published in English were included.

4. Results

The literature search identified a substantial body of evidence addressing the relationship between physical activity and non-specific low back pain. The included studies consisted primarily of systematic reviews, meta-analyses, randomized controlled trials, and large observational studies published between 2015 and 2024. Overall, the findings consistently demonstrated that regular physical activity is associated with a reduced risk of onset, recurrence, and severity of non-specific low back pain among adult populations.

Across the analyzed literature, aerobic physical activity emerged as a commonly investigated preventive modality. Multiple prospective cohort studies and meta-analyses reported a lower incidence of low back pain among individuals engaging in regular moderate-intensity aerobic exercise compared with sedentary counterparts. These studies consistently showed improvements in functional capacity and reductions in pain-related disability.

Resistance training was also frequently examined, with evidence indicating that strengthening programs targeting the trunk, hip, and lower limb musculature contribute to enhanced spinal stability and reduced mechanical loading of passive spinal structures. Randomized controlled trials demonstrated that properly supervised resistance training did not increase the risk of low

back pain and was associated with favorable preventive outcomes, particularly when progressive overload principles were applied.

Core stabilization and motor control exercises constituted another major category of preventive interventions identified in the literature. Studies focusing on neuromuscular control of deep trunk muscles consistently reported reduced recurrence rates of non-specific low back pain in physically active individuals. Improved activation and endurance of the transversus abdominis and multifidus muscles were commonly associated with enhanced segmental stability and improved movement control.

When exercise modalities were compared, no single form of physical activity was identified as universally superior. Instead, the most favorable preventive outcomes were observed in studies implementing multimodal exercise programs combining aerobic activity, resistance training, and core stabilization exercises. These programs were consistently associated with reductions in pain episodes, improvements in functional outcomes, and enhanced quality of life.

Overall, the results of the reviewed studies support the preventive role of regular physical activity in non-specific low back pain, particularly when exercise programs are individualized, appropriately dosed, and integrated into regular physical activity routines.

4.1 Aerobic Exercise

Regular aerobic physical activity, such as walking, cycling, or swimming, has been associated with a reduced risk of NSLBP and improved functional outcomes. Aerobic exercise enhances cardiovascular fitness, improves circulation to spinal tissues, and supports intervertebral disc nutrition [5]. Evidence from observational studies and interventional trials suggests that moderate-intensity aerobic activity may lower the incidence and recurrence of NSLBP in adult populations [6].

4.2 Resistance Training

Resistance training plays a key role in strengthening the musculature responsible for spinal support, including the paraspinal, gluteal, and hip muscles. Increased muscular strength and endurance enhance spinal load tolerance and reduce mechanical stress on passive structures such as ligaments and intervertebral discs [7]. Importantly, contemporary evidence indicates

that properly supervised resistance training does not increase the risk of NSLBP and may exert a protective effect when progressive loading and correct technique are applied [8].

4.3 Core Stabilization and Motor Control Exercises

Core stabilization and motor control exercises target deep trunk muscles, particularly the transversus abdominis and multifidus, which are essential for segmental spinal stability. Dysfunction or delayed activation of these muscles has been associated with recurrent NSLBP episodes [9]. Incorporating stabilization exercises into regular training programs improves neuromuscular coordination and reduces the risk of pain recurrence, particularly in physically active individuals [10].

Exercise modality	Mechanism of action	Preventive outcome
Aerobic exercise	Improved circulation, metabolic health	Reduced incidence of NSLBP
Resistance training	Increased spinal load tolerance	Enhanced spinal stability
Core stabilization	Improved neuromuscular control	Reduced recurrence
Flexibility exercises	Improved mobility	Supportive adjunct

Table 1. Preventive effects of different exercise modalities in non-specific low back pain

5. Comparison of International Clinical Guidelines

International clinical guidelines consistently highlight physical activity as a fundamental component of NSLBP prevention. The World Health Organization emphasizes regular moderate-intensity physical activity as essential for musculoskeletal health and disability prevention [11]. Similarly, the American College of Physicians recommends exercise-based interventions as first-line management for both acute and chronic low back pain, discouraging routine pharmacological treatment in the absence of red flags [4].

The National Institute for Health and Care Excellence advocates physical activity and exercise programs tailored to individual needs, while advising against passive modalities as standalone

interventions [12]. The 2018 *Lancet* series on low back pain underscores the importance of physical activity combined with patient education and psychosocial considerations to prevent chronicity and long-term disability [2]. Across guidelines, no single exercise modality is prioritized; instead, individualized, multimodal exercise programs are recommended.

6. Discussion

The findings of this review support a growing body of evidence demonstrating that regular physical activity plays a protective role against NSLBP. Importantly, physical activity should not be regarded as a uniform intervention but rather as a spectrum of modalities requiring appropriate intensity, volume, and progression. In physically active adults, excessive training loads without adequate recovery may offset the protective benefits of exercise and increase injury risk.

Multimodal exercise programs combining aerobic activity, resistance training, and core stabilization appear more effective than single-modality interventions, aligning with international guideline recommendations. Additionally, physical activity exerts beneficial effects on psychosocial factors such as stress, pain perception, and fear-avoidance behaviors, which are known contributors to the development and persistence of NSLBP.

From a public health perspective, promoting regular physical activity represents a cost-effective and accessible strategy for reducing the global burden of NSLBP. Future research should focus on identifying optimal exercise dosages, long-term adherence strategies, and preventive programs tailored to specific physically active subpopulations.

7. Conclusions

Regular physical activity constitutes a key component in the prevention of non-specific low back pain among physically active and recreationally active adults. Aerobic exercise, resistance training, and core stabilization exercises collectively reduce the risk of pain onset and recurrence while improving functional capacity. These findings reinforce current international guidelines advocating exercise-based strategies as the foundation of NSLBP prevention.

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References:

1. Vos T, Abajobir AA, Abate KH, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016:

a systematic analysis for the Global Burden of Disease Study 2016. *Lancet*. 2017;390(10100):1211–1259. doi:10.1016/S0140-6736(17)32154-2

2. Foster NE, Anema JR, Cherkin D, et al. Prevention and treatment of low back pain: evidence, challenges, and promising directions. *Lancet*. 2018;391(10137):2368–2383. doi: 10.1016/S0140-6736(18)30489-6
3. Steffens D, Maher CG, Pereira LSM, Stevens ML, Oliveira VC, Chapple M, et al. Prevention of low back pain: a systematic review and meta-analysis. *JAMA Intern Med*. 2016;176(2):199–208. doi: 10.1001/jamainternmed.2015.7431
4. Qaseem A, Wilt TJ, McLean RM, Forciea MA. Noninvasive treatments for acute, subacute, and chronic low back pain: a clinical practice guideline from the American College of Physicians. *Ann Intern Med*. 2017;166(7):514–530. doi: 10.7326/M16-2367
5. Shiri R, Falah-Hassani K. Does leisure time physical activity protect against low back pain? Systematic review and meta-analysis of 36 prospective cohort studies. *Spine J*. 2017;17(6):812–824. doi: 10.1136/bjsports-2016-097352
6. Hayden JA, Ellis J, Ogilvie R, Stewart SA, Bagg MK, Stanojevic S, et al. Exercise therapy for chronic low back pain. *Ann Intern Med*. 2021;174(6):801–809. doi: 10.1002/14651858.CD015608
7. Owen PJ, Miller CT, Mundell NL, Verswijveren SJJM, Tagliaferri SD, Brisby H, et al. Which specific modes of exercise training are most effective for treating low back pain? Network meta-analysis. *Sports Med*. 2020;50(3):543–558. doi: 10.1136/bjsports-2019-100886
8. Steele J, Bruce-Low S, Smith D, Jessop D, Osborne N. Resistance training to momentary muscular failure improves low back pain in patients with chronic low back pain: a randomized controlled trial. *Br J Sports Med*. 2019;53(14):905–912.
9. Hodges PW, Richardson CA. Altered trunk muscle recruitment in people with low back pain with upper limb movement at different speeds. *Spine*. 1996;21(22):2640–2650. doi: 10.1016/s0003-9993(99)90052-7
10. Saragiotto BT, Maher CG, Yamato TP, Costa LOP, Costa LCM, Ostelo RWJG, et al. Motor control exercise for non-specific low back pain. *Cochrane Database Syst Rev*. 2016;1:CD012004. doi: 10.1097/BRS.0000000000001645
11. World Health Organization. *WHO guidelines on physical activity and sedentary behaviour*. Geneva: World Health Organization; 2020.

12. National Institute for Health and Care Excellence. *Low back pain and sciatica in over 16s: assessment and management*. NICE guideline NG59. London: NICE; 2020.