Physical and psychological differences between athletes with and without chronic primary low back pain: a scoping review

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Summary

Chronic primary low back pain (CPLBP) is defined as persisting or recurring for more than three months, with no identifiable nociceptive source [1]. CPLBP is common among athletes and significantly impacts their physical performance and mental health. This scoping review examines the effects of CPLBP on neuromuscular control, movement strategies, and psychological well-being in athletes. The included studies used various tools such as electromyography to assess muscle activity, kinetics and kinematics to assess strength, flexibility, stability, and coordination. The findings highlight notable physical and psychological differences between athletes with and without CPLBP, though inconsistencies in study design limit their generalizability. Standardized methods and sport-specific approaches are needed to improve our understanding of CPLBP in athletes.

Introduction

Low back pain affects up to 84% of adults in the general population during their lifetime [2]. This condition is also prevalent in athletes, with lifetime prevalence rates ranging from 1% to 94% depending on the study design, the athlete population, or the CPLBP definition used. Low back pain is problematic in athletes, impacting performance, increasing injury risk, and causing training or competition absenteeism. While low back pain research in athletes has expanded, the effects of chronicity on their physical and psychological characteristics remain underexplored. This scoping review aims to synthesize the current literature on CPLBP in athletes, focusing on the physical and psychological differences between athletes with and without CPLBP.

Methods

A systematic search across MEDLINE, CINAHL, SportDiscus, and PsycINFO, guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Guidelines (PRISMA) was conducted up to March 2024. The search was based on three key concepts: "chronic low back pain," "physical and psychological characteristics," and "athletes." To be included, the studies had to be conducted with trained athletes with and without CPLBP. The athlete status was defined according to Tier 2 of the McKay et al. (2022) [3] classification corresponding to trained athletes.

Results and Discussion

A total of 717 athletes from 11 studies were included, of whom 37% were women. Athletes with CPLBP showed significantly lower electromyography amplitudes and delayed muscle activation compared to athletes without CPLBP. Regarding back muscle strength, while some studies reported significantly reduced trunk extension strength in athletes with CPLBP, others found no significant differences between athletes with and without CPLBP. Kinematic evaluations showed significantly altered movement patterns in athletes with CPLBP, including reduced thoracic spinal flexion and greater hip flexion compared to athletes without CPLBP. Psychologically, CPLBP athletes reported significantly higher levels of kinesiophobia, catastrophizing, and anxiety compared to athletes without CPLBP (Figure 1).

Figure 1: Percentage of observations showing significant or non-significant differences between athletes with and without CPLBP

Although results are somewhat heterogeneous probably due to differences in methodologies and individual adaptations, the changes observed in neuromuscular control, movement strategies and psychological well-being may reflect adaptive protective strategies put in place by athletes with CPLBP to minimize pain or avoid further injury [4].

Conclusions

This review shows alterations in muscle activation, movement strategies and psychological states in athletes with CPLBP. However, most studies do not test athletes under conditions like their sporting activities. Testing with sport-specific assessments or under fatigue conditions would better reflect the consequences of CPLBP on sports performance.

References

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