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Outcomes of clinical studies of mindset and lifestyle in sports performance: a systematic review

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Abstract

Introduction: The athlete's lifestyle and mindset become an integral part of sports performance. The quest to improve the performance of world-class athletes involves understanding the attributes, skills, strategies, support, environment, and lifestyles of elite performers. **Objective:** It was to develop a systematic review to highlight the main outcomes of clinical studies of mindset and lifestyle in sports performance. **Methods:** The PRISMA Platform systematic review rules were followed. The research was carried out from September to October 2023 in the Web of Science, Scopus, PubMed, Science Direct, Scielo, and Google Scholar databases. The quality of the studies was based on the GRADE instrument and the risk of bias was analyzed according to the Cochrane instrument. **Results and Conclusion:** A total of 151 articles were found, and 34 articles were evaluated in full, and 27 were included and developed in the present systematic review study. Considering the Cochrane tool for risk of bias, the overall assessment resulted in 29 studies with a high risk of bias and 44 studies that did not meet GRADE and AMSTAR-2. Most studies showed homogeneity in their results, with X^2=61.9%>50%. It was concluded that champion athletes attribute their good mindset as the main predictor of competitive success. Furthermore, championship performance requires a particular way of life that integrates mindset, performance factors, lifestyle, and relationships. High-performance strategies include using sharp mental rehearsal skills and practice retrieval.

Keywords: Athletes. Sports performance. Mindset. Lifestyle.

Introduction

The athlete's lifestyle and mindset become an integral part of sports performance [1-3]. It is necessary to balance several factors such as the demands of competition, stressors, negative unlucky events, and interactions with family, colleagues, coaching, and support staff [3]. In this sense, lifestyle practices and daily routines such as sleep, relaxation, diet, hydration, water immersion therapy, entertainment, and social media are therefore essential to achieving and maintaining elite performance [4-7]. Therefore, the quest to improve the performance of world-class athletes involves understanding the attributes, skills, strategies, support, environment, and lifestyles of elite performers [8-12].

In this context, international sports agencies such as the International Olympic Committee suggest that support for an athlete should be holistic, integrated, and evidencebased [13]. In this sense, it is necessary to focus on the mindset of athletes, exploring the perspectives of elite athletes through a qualitative approach, to understand the lifestyle and other factors to which they attribute their success [14].

Still, training load monitoring has many potential applications and cannot simply be reduced to a metric and/or calculation. It is important to highlight that it is also necessary to manage the training load with a performance mindset and training progression [15]. For example, feeling confident has been shown to improve cognition and performance, whereas a lack of confidence (e.g., feeling helpless, or anxious) is stifling cognition and performance [16,17]. Furthermore, it has been shown that certain mindsets, such as believing in yourself even after failure, called the constructive mindset, are very beneficial for perseverance,

motivation, and improved performance in athletes. Furthermore, feedback from teachers and coaches has demonstrated an internal impact on athletes, including influencing motivation, mindset, learning potential, and resilience to challenges [18-20].

Therefore, the present study aimed to develop a systematic review to highlight the main outcomes of clinical studies of mindset and lifestyle in sports performance.

Methods

Study Design

The present study followed the international systematic review model, following the rules of PRISMA (preferred reporting items for systematic reviews and meta-analysis). Available at: http://www.prisma-statement.org/?AspxAutoDetectCookieSupport=1. Accessed on: 10/19/2023. The methodological quality standards of AMSTAR-2 (Assessing the methodological quality of systematic reviews) were also followed. Available at: https://amstar.ca/. Accessed on: 10/19/2023.

Data Sources and Research Strategy

The literary search process was carried out from September to October 2023 and was developed based on Scopus, PubMed, Lilacs, Ebsco, Scielo, and Google Scholar, covering scientific articles from various eras to the present. The descriptors (MeSH Terms) were used: *"Athletes. Sports performance. Mindset. Lifestyle"*, and using the Boolean "and" between the MeSH terms and "or" between historical discoveries.

Study Quality and Risk of Bias

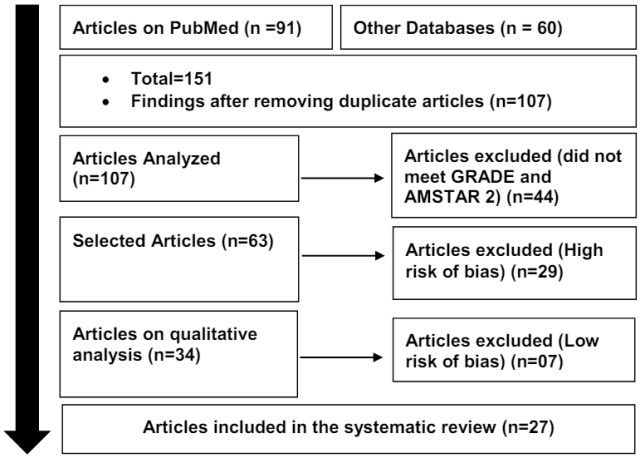
Quality was classified as high, moderate, low or very low in terms of risk of bias, clarity of comparisons, precision and consistency of analyses. The most evident emphasis was on systematic review articles or meta-analysis of randomized clinical trials, followed by randomized clinical trials. The low quality of evidence was attributed to case reports, editorials and brief communications, according to the GRADE instrument. The risk of bias was analyzed according to the Cochrane instrument by analyzing the Funnel Plot graph (Sample size versus Effect size), using the Cohen test (d).

Results and Discussion

Summary of Findings

A total of 151 articles were found that were subjected to eligibility analysis, with 27 final studies being selected to compose the results of this systematic review. The studies listed were of medium to high quality (Figure 1), considering the level of scientific evidence of studies such as meta-analysis, consensus, randomized clinical, prospective and observational. The biases did not compromise the scientific basis of the studies. According to the GRADE instrument, most studies showed homogeneity in their results, with X^2=61.9%>50%. Considering the Cochrane tool for risk of bias, the overall assessment resulted in 29 studies with a high risk of bias and 44 studies that did not meet GRADE and AMSTAR-2.

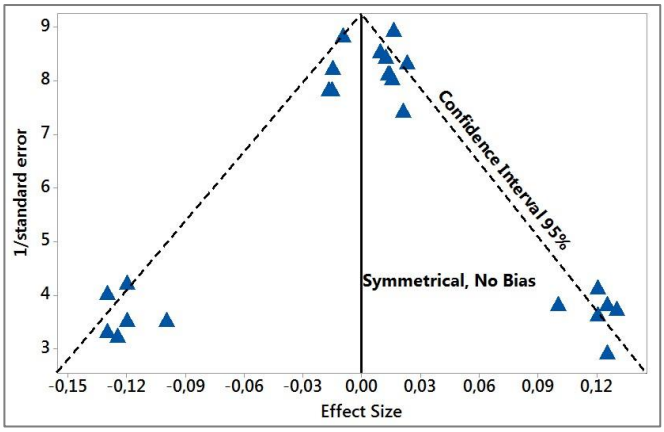
Figure 1. Flowchart - Article selection process.



Source: Own Authorship.

Figure 2 presents the results of the risk of bias of the studies using the Funnel Plot, showing the calculation of the Effect Size (Magnitude of the difference) using the Cohen Test (d). Precision (sample size) was determined indirectly by the inverse of the standard error (1/Standard Error). This graph had a symmetrical behavior, not suggesting a significant risk of bias, both between studies with a small sample size (lower precision) that are shown at the bottom of the graph and in studies with a large sample size that are presented at the top.

Figure 2. The symmetric funnel plot suggests no risk of bias among the small sample size studies that are shown at the bottom of the graph. High confidence and high recommendation studies are shown above the graph (n= 27 studies).



Source: Own Authorship.

Main Outcomes – Lifestyle, Mindset and Sports Performance

After the careful selection of the literary search, it became clear that a study developed knowledge about the lifestyle of elite athletes. Participants in the first phase included 19 sports experts such as sports sociologists, sports psychologists, and sports coaches, who were selected through purposive and snowball sampling methods to conduct in-depth unstructured interviews. According to the results, the lifestyle of Iranian elite athletes includes indicators such as professional mindset, skills, outlook on life, financial education, responsibility, consumption, leisure, personal issues, and religious behavior. The subjects of the second phase were 44 national-level athletes who voluntarily participated in the study. Five dominant lifestyles have been identified among elite athletes: consumerist, relaxed, socially useful, profit-oriented, and professional [21].

Furthermore, mindfulness can benefit the mindset and performance of athletes. These benefits can be enhanced by sport-specific mindfulness interventions. A study developed by authors Sparks et al. (2022) [22] aimed to develop a mindfulness intervention specific to rowing and, second, investigate its effects on mindfulness, flow, reinvestment, and rowing performance. Rowers were randomly assigned to a 6-week rowing-specific mindfulness intervention (n=23), which included both generic and rowing-specific practices, or a control group (n=21). Rowers completed pre-test and post-test measures of performance, mindfulness, flow, and rowing-specific reinvestment. The results demonstrated that the intervention group increased flow, mindfulness, and improved performance, in addition, conscious motor processing decreased from the pretest to the post-test. However, the intervention did not preferentially change mindfulness or reinvestment compared to the control. Participants provided favorable feedback and evaluated the intervention positively. The 6-week rowing-specific mindfulness intervention promoted flow, encouraged mindfulness, and helped performance. Therefore, a sport-specific mindfulness intervention may benefit athletes.

A recent study carried out by the authors Cnossen et al. (2023) [23] analyzed how stress coping skills, such as stress mindset, affect performance and awareness in the context of a football match. A total of twenty elite female football players participated in the study. The final sample size consisted of 15 players for the Stress Mindset Measure (SMM) analysis and 8 players for the multilevel model analyses. Two types of intervention were used to manipulate stress mindset and control heart rate variability (HRV); a serious game called "Stressjam" and a reflection tool called "Brainjam". The "Stressjam" intervention resulted in significant differences in stress mindset throughout the intervention ($p=0.008$). Multilevel analysis showed a positive, strong, and significant correlation between stress mindset, manipulated through "Stressjam" and SA ($p=0.014$). A correlation of practical interest, given confidence intervals, was found between stress mindset, manipulated through "Stressjam", and performance. Therefore, cognitive variables, such as coping with stress, significantly correlate with football awareness. A correlation of practical interest was found between stress coping and performance.

Also, a person's beliefs about the nature of stress (stress mindset) play an important role in the extent to which someone experiences the harmful or beneficial results of stress. Stress mindset has been explored in college students, but there is limited research on stress mindsets in student-athletes. Sport can serve as a buffer to the negative impacts of stress for some student-athletes; however, the pressures associated with sports participation increase stress in other student-athletes. Along those lines, one study looked at potential differences in stress mindset and perceived stress between non-athletes and college athletes. A total of 272 students (n = 87 student-athletes; n = 185 non-athletes) completed a demographic questionnaire, the Perceived Stress Scale, and the Stress Mindset Measure via an online survey. No significant differences were observed between the stress mindset scores of student-athletes and non-athletes; however, significant differences were observed between the stress perceived by student-athletes and non-athletes. Thus, student-athletes and non-athletes shared a similar view of stress, but student-athletes reported a lower level of perceived stress than non-athletes [24].

In this way, the strengthening of sports psychology and mindset has grown substantially in the last two decades. Few in the field of competitive athletics have discussed the importance of being mentally prepared before an athletic competition, as well as the need to maintain that particular mindset during a competitive competition. There is still a lack of understanding about the process and mechanisms by which these mental skills affect performance. Thus, a study described how training mental skills resulted in better performance within competition [25].

International sporting bodies advocate a holistic approach to the athletic profile and environmental factors for world-class sporting performance. Thus, a study explored the contribution, impact of lifestyle, and psychological factors among a sample of worldclass champion athletes. Four dominant and overlapping themes emerged: psychological attributes, interpersonal

relationships, performance strategies, and lifestyle practices. All athletes attributed their success to psychological rather than physical factors, and the vast majority relied on mental rehearsal skills and recovery practices. Therefore, the athletic profile and support required to achieve and maintain podium-level performance are multidimensional, integrated, and individualized, and psychological factors are key. In this regard, there is ample evidence that mindset and emotion affect athlete performance. Military and sports organizations have focused on optimizing the internal states of their military personnel and athletes, respectively, to improve performance and well-being [14].

The authors Loizou et al. (2015) [26] evaluated the psychological and psychophysiological effects of video and music when used as a pre-performance intervention for an anaerobic endurance task. Fifteen men (age = 26.3 ± 2.8 years) were exposed to four conditions before performing the Wingate Anaerobic Test: music only, video and music, video with music, and a no video/no music control. Results showed that the combined video and music conditions were the most effective in terms of influencing participants' pre-task effect and subsequent anaerobic performance, followed by the music-only condition.

Finally, a person's beliefs about the nature of stress (e.g., stress mindset) play an important role in the extent to which someone experiences the harmful or beneficial outcomes of stress. Stress mindset has been explored in college students, but there is limited research on stress mindsets in student-athletes. Sport can serve as a buffer to the negative impacts of stress for some student-athletes; however, the pressures associated with sports participation increase stress in other student-athletes. Building on this, one study examined potential differences in stress mindset and perceived stress between nonathletes and college athletes. We hypothesized that college student-athletes would report higher stress mindset scores but lower perceived stress scores. A total of 272 students (n = 87 student-athletes; n = 185 non-athletes) completed a demographic questionnaire, the Perceived Stress Scale, and the Stress Mindset Measure via an online survey. No significant differences were observed between the stress mindset scores of studentathletes and non-athletes; however, significant differences were observed between the stress perceived by student-athletes and non-athletes. Thus, student-athletes and non-athletes shared a similar view of stress, but student-athletes reported a lower level of perceived stress than non-athletes. Although there appear to be no statistically significant differences in stress mindset between college non-athletes and student-athletes, both groups reported holding a mindset that stress is debilitating [27].

Conclusion

It was concluded that champion athletes attribute their good mindset as the main predictor of competitive success. Furthermore, championship performance requires a particular way of life that integrates mindset, performance factors, lifestyle, and relationships. High-performance strategies include using sharp mental rehearsal skills and practice retrieval.

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No additional data are available.

Conflict of interest

The authors declare no conflict of interest.

Similarity check

It was applied by Ithenticate@.

Peer Review Process

It was performed.

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