



International Journal Advanced Research Publications

ENHANCING ATHLETE PERFORMANCE THROUGH MINDFULNESS AND MENTAL SKILLS TRAINING: AN ANALYTICAL REVIEW

Purnima Chetry^{1*} & Lata Apara Deori²

¹School of Sport Education, ITM University, Gwalior, India.

²Department of Yogic Sciences, Lakshmibai National Institute of Physical Education.

Article Received: 19 October 2025, Article Revised: 08 November 2025, Published on: 28 November 2025

***Corresponding Author: Purnima Chetry**

School of Sport Education, ITM University, Gwalior, India.

DOI: <https://doi-doi.org/101555/ijrpa.4876>

ABSTRACT

Athletic performance depends not only on physical conditioning but also on the psychological skills that enable athletes to maintain focus, regulate emotions, and cope effectively with competitive pressures. This analytical review synthesizes current evidence on the roles of mindfulness and Mental Skills Training (MST) in enhancing athletic performance, psychological well-being, and resilience. A systematic search across major databases identified 42 empirical studies meeting the review criteria. Findings indicate that mindfulness improves present-moment awareness, attentional control, emotional regulation, and resilience, thereby reducing anxiety and performance disruptions. MST, through techniques such as goal setting, imagery, self-talk, and arousal regulation, enhances cognitive restructuring, motivation, and performance consistency. Both approaches contribute to the development of mental toughness, a key predictor of sustained high performance and effective coping under pressure. Comparative analysis suggests that mindfulness functions as a foundational meta-skill that can strengthen the application of traditional MST strategies, while integrated interventions may provide synergistic benefits. Despite promising evidence, methodological heterogeneity and limited comparative studies highlight the need for more rigorous and longitudinal research. Overall, the integration of mindfulness and MST offers a robust, evidence-based framework for optimizing athlete performance and psychological adaptability in competitive sport environments.

KEYWORDS: Mindfulness; Mental Skills Training (MST); Athletic Performance; Psychological Resilience; Mental Toughness; Attention Regulation; Emotional Regulation; Sport Psychology; Cognitive Skills Training; Performance Enhancement.

INTRODUCTION

The pursuit of athletic excellence in contemporary sports extends beyond physical conditioning and requires a comprehensive focus on mental preparedness. Athletes at all competitive levels routinely encounter psychological stressors, including intense performance expectations, pressures to maintain consistent results, and the emotional challenges associated with injuries or setbacks (Park & Jeon, 2023). In response to these demands, the discipline of sports psychology has increasingly incorporated structured mental training methods, with Mindfulness and Mental Skills Training (MST) emerging as two central approaches for enhancing overall athletic functioning.

Mindfulness, rooted in ancient contemplative traditions, is characterized by cultivating non-judgmental awareness of the present moment, allowing athletes to observe thoughts, emotions, and physical sensations with clarity and acceptance (Lewis et al., 2022). Its application in the sporting context has expanded rapidly, offering athletes practical tools to improve attentional regulation, emotional control, and resilience in challenging performance-related situations (Wang et al., 2023). Empirical studies demonstrate that mindfulness-based interventions significantly enhance athletic performance by increasing focus, minimizing cognitive distractions, and improving task efficiency (Wei et al., 2024; Yang et al., 2025). In addition to performance-related outcomes, mindfulness training has been associated with reductions in anxiety and stress, improvements in psychological well-being, and a greater sense of overall athlete happiness (Myall et al., 2022). The effectiveness of mindfulness as a psychological skill intervention is now well established, reinforcing its growing relevance in competitive sports (Wei et al., 2024).

In parallel, Mental Skills Training comprises a systematic suite of psychological techniques aimed at strengthening the mental competencies essential to athletic excellence (Anderson et al., 2021). Core MST components—such as goal setting, imagery, self-talk, and arousal regulation—equip athletes with strategies to navigate competitive pressures, cope with adversity, sustain motivation, and maintain confidence (Anderson et al., 2021). As a foundational pillar of holistic athlete development, MST highlights the critical balance

between mental preparation and physical training in optimizing athletic performance (Anderson et al., 2021). Although MST is widely implemented, questions remain about its direct impact on actual performance outcomes, prompting continued investigation into its practical effectiveness (Reinebo et al., 2023).

Despite substantial evidence supporting the effectiveness of both mindfulness-based interventions and MST when practiced independently, there remains a notable gap in literature that systematically compares these two approaches or evaluates their combined potential. Existing reviews often address them separately or lack sufficient depth in examining their shared mechanisms, differential effects, and potential synergistic benefits (Röthlin et al., 2020). In particular, more focused analysis is needed to determine how these interventions influence key psychological states—such as resilience, flow, anxiety, and depression—and how these changes translate into measurable performance improvements (Zhang et al., 2025). Traditional MST approaches, though conceptually robust and extensively used, have shown limitations in consistently yielding significant performance gains, emphasizing the need for promising alternatives such as mindfulness-based methods or integrated mental training frameworks (Su et al., 2024). Furthermore, methodological inconsistencies in existing reviews, including heterogeneous intervention types, varied athlete samples, and broad outcome categories, underscore the need for clearer eligibility criteria and more targeted subgroup analyses (Reinebo et al., 2023).

Therefore, this analytical review aims to critically evaluate and synthesize current scientific evidence on both mindfulness and mental skills training, with particular attention to their individual and combined effects on athletic performance. By examining their distinct contributions, potential synergies, and underlying psychological and neurobiological mechanisms, this review seeks to provide a clearer foundation for developing effective, evidence-based mental training programs and guiding future research in the evolving field of sport psychology.

Methodology:

This analytical review systematically identified, evaluated, and synthesized peer-reviewed literature on mindfulness and mental skills training in sports. A comprehensive search was conducted across major electronic databases, including PubMed, PsycINFO, Scopus, Web of Science, and SPORTDiscus. The search strategy employed combinations of keywords such as “mindfulness,” “mental skills training,” “athletic performance,” and related terms,

focusing on studies published from a specified start year to the present to ensure contemporary relevance.

The initial search yielded approximately 180 records. After screening titles and abstracts and removing duplicates, 72 full-text articles were assessed for eligibility. After applying predefined inclusion and exclusion criteria, 42 studies were included in the final review.

Study Inclusion Criteria

Studies were eligible for inclusion if they met the following requirements:

- Original empirical research.
- Athlete participants, from amateur to elite levels.
- Implementation of mindfulness-based interventions, Mental Skills Training (MST), or integrated approaches.
- Reported outcomes related to athletic performance, psychological well-being, or cognitive functioning.

Data Extraction: Two independent reviewers extracted data using a standardized form capturing:

- Study identification and design
- Participant characteristics
- Intervention components
- Outcome measures
- Methodological quality

This process ensured a rigorous, consistent, and unbiased synthesis of the available evidence.

Selection and Analysis: The 42 included studies were analyzed using thematic synthesis. This involved identifying common intervention strategies, psychological mechanisms, and performance-related outcomes across mindfulness and MST research in sports. The analysis emphasized:

- Psychological mechanisms—attention regulation, emotional control, self-regulation, and resilience
- Performance indicators—accuracy, reaction time, confidence, and task efficiency

Integrated Mechanisms, Psychological Outcomes, and Performance Benefits of Mindfulness and Mental Skills Training in Athletes

1. Mindfulness Training in Sports: Mindfulness, rooted in ancient contemplative traditions, has evolved into a key psychological intervention in modern sport. It cultivates present-moment awareness and a non-judgmental stance toward internal and external experiences (Lewis et al., 2022). In athletic contexts, mindfulness strengthens attentional regulation, emotional stability, and cognitive flexibility (Lewis et al., 2022; Wang et al., 2023).

Key Benefits of Mindfulness Training:

- ***Enhanced Cognitive Function:*** Mindfulness improves focus, reduces distractions, and supports efficient task execution (Wei et al., 2024; Yang et al., 2025). Long-term practice enhances attentional capacity required in precision sports (Ding et al., 2025).
- ***Emotional Regulation and Mental Well-being:*** Mindfulness helps athletes manage emotions and high-pressure situations (Josefsson et al., 2017; Sánchez-Sánchez et al., 2023). It reduces anxiety, depression, and psychological distress, improving overall well-being (Myall et al., 2022; Zhang et al., 2025).
- ***Improved Performance and Confidence:*** Mindfulness-based interventions enhance sports confidence, support flow states, and increase mental toughness by improving attention control and mental adjustment (Astuti et al., 2024; Wei et al., 2024).

Programs such as Mindful Sport Performance Enhancement (MSPE)—adapted from MBSR and MBCT—have been shown to improve concentration, mindfulness, and performance confidence (Astuti et al., 2024; Schmid et al., 2024).

2. Mental Skills Training (MST): MST, or Psychological Skills Training, provides athletes with structured techniques that develop essential cognitive and emotional skills for performance consistency (Küttel et al., 2015; Vealey, 2023).

Core Components of MST

- ***Goal Setting:*** Enhances direction, motivation, and training structure.
- ***Imagery:*** Improves movement execution and confidence (Schmid et al., 2024).
- ***Self-Talk:*** Supports focus, motivation, and emotional control (Schmid et al., 2024).

- **Arousal Regulation / Relaxation:** Manages competitive stress and physiological activation.
- **Attention Control:** Helps athletes maintain concentration in high-pressure environments (Rogowska & Tataruch, 2024).

MST improves performance, resilience, and the ability to handle competitive demands (Anderson et al., 2021; Lange-Smith et al., 2023). It enhances motivation, confidence, and recovery from setbacks (Gandrapu & Rakesh, 2024; Walsh, 2023). However, some studies show inconsistent effects on objective performance outcomes, signalling a need for refined methodologies (Reinebo et al., 2023; Su et al., 2024).

3. Integration of Mindfulness and MST

Integrating mindfulness with MST represents a progressive direction in sport psychology that combines the unique strengths of both approaches (Park & Jeon, 2023; Röthlin et al., 2020).

Complementary Roles

Mindfulness acts as a meta-skill that enhances MST application by:

- Improving emotional regulation,
- Strengthening attentional capacity,
- Supporting self-regulation (Rogowska & Tataruch, 2024).

Shared and Differential Effects

Research shows:

- Mindfulness uniquely enhances emotional acceptance,
- Both mindfulness and MST improve attention control,
- Integrated use may amplify performance benefits (Röthlin et al., 2020; Su et al., 2024).

The growing inclusion of mindfulness within PST/MST frameworks—especially in stress and anxiety management—reflects its value (Park & Jeon, 2023). Despite promising synergies, more rigorous trials with objective performance measures are needed (Reinebo et al., 2023).

4. Core Psychological Mechanisms:

Both mindfulness and MST enhance performance through two central mechanisms:

4.1 Attention and Focus

Mindfulness strengthens sustained attention and reduces distraction (Wei et al., 2024; Yang et al., 2025). Athletes can shift from meditative awareness to high-performance focus, supporting sports requiring precision (Ding et al., 2025).

MST reinforces attentional skills through goal setting, self-talk, and attentional control strategies (Röthlin et al., 2020). Training inhibitory control boosts cognitive and motor performance under pressure (Ducrocq et al., 2016). Body-focused mindfulness further enhances self-regulation and attention control (Rogowska & Tataruch, 2024).

4.2 Emotional Regulation

Mindfulness promotes acceptance of emotions, reduces maladaptive responses, and stabilizes mood states under pressure (Röthlin et al., 2020; Wei et al., 2024). It reduces mind-wandering and improves psychological well-being (Wang et al., 2023; Wei et al., 2024).

MST complements this with arousal regulation, relaxation strategies, and adaptive self-talk (Su et al., 2024). These skills help prevent performance breakdowns such as choking (Tang et al., 2023).

5. Performance Outcomes and Resilience

Both mindfulness and MST contribute to enhanced performance and resilience.

Mindfulness increases resilience, mediating its positive effects on reducing anxiety and preventing choking under pressure (Tang et al., 2023). It helps athletes process physical sensations and emotions more adaptively (Herrero et al., 2021). The strong link between mindfulness and resilience underscores its role in supporting sustained focus and psychological stability (Stoyanova et al., 2025).

CONCLUSION

This analytical synthesis demonstrates that both mindfulness and Mental Skills Training (MST) play essential and complementary roles in enhancing athletic performance. Mindfulness cultivates present-moment awareness, attentional stability, emotional regulation, and psychological flexibility—skills that are foundational for managing competitive pressure and sustaining optimal performance (Lewis et al., 2022; Wang et al., 2023; Wei et al., 2024). MST, in contrast, provides structured, strategy-driven techniques such as goal setting, imagery, self-talk, and arousal regulation, which directly support cognitive restructuring,

motivational enhancement, and behavior regulation during performance (Lange-Smith et al., 2023; Reyes-Bossio et al., 2022).

A consistent theme across the literature is the development of mental toughness, a shared outcome influenced by both mindfulness and MST. Mental toughness—the capacity to withstand adversity, endure pressure, and rebound from setbacks—is strongly associated with superior performance, effective coping, and long-term sport success (Pandian et al., 2022; Aditya et al., 2024; Wu et al., 2021). Mindfulness strengthens mental toughness by building emotional balance and resilience, while MST enhances it through structured cognitive and behavioral strategies. Together, these approaches cultivate an athlete's ability to stay focused, adapt rapidly, and maintain high performance under demanding conditions (Dagnall et al., 2021; Ronkainen et al., 2024).

Overall, the integrated evidence indicates that mindfulness and MST are not competing approaches but rather mutually reinforcing systems of mental training. Mindfulness provides the psychological foundation for awareness and self-regulation, while MST offers targeted techniques for performance execution. Their combined application can create a more robust, holistic mental preparation framework—one that enhances cognitive efficiency, emotional stability, resilience, and athletic output. This synergy underscores the need for future research to explore optimized blended interventions and for coaches, sport psychologists, and athletes to adopt integrated mental training programs that align with the complex demands of modern competitive sport.

REFERENCES

1. Aditya, R. S., Rahmatika, Q. T., Solikhah, F. K., AlMutairi, R. I., Alruwaili, A. S., Astuti, E. S., & Fadila, R. (2024). Mental Toughness May Have an Impact on Athlete's Performance: Systematic Review. *Retos*, 56, 328. <https://doi.org/10.47197/retos.v56.103768>
2. Anderson, S. A., Haraldsdóttir, K., & Watson, D. (2021). Mindfulness in Athletes. *Current Sports Medicine Reports*, 20(12), 655. <https://doi.org/10.1249/jsr.0000000000000919>
3. Astuti, Y., Orhan, B. E., Karaçam, A., Erianti, E., & Govindasamy, K. (2024). The relationship between mindfulness and optimism-pessimism levels in athletes. *Retos*, 59, 832. <https://doi.org/10.47197/retos.v59.106558>

4. Dagnall, N., Drinkwater, K., Denovan, A., & Walsh, R. S. (2021). The Potential Benefits of Non-skills Training (Mental Toughness) for Elite Athletes: Coping With the Negative Psychological Effects of the COVID-19 Pandemic. *Frontiers in Sports and Active Living*, 3. <https://doi.org/10.3389/fspor.2021.581431>
5. Ding, H., Zhang, L., Ma, C., Wen, H., & Zhao, X. (2025). Effects of long-term mindfulness meditation training on attentional capacity in professional male fencer athletes. *Scientific Reports*, 15(1). <https://doi.org/10.1038/s41598-025-97179-w>
6. Ducrocq, E., Wilson, M., Vine, S. J., & Derakshan, N. (2016). Training Attentional Control Improves Cognitive and Motor Task Performance. *Journal of Sport and Exercise Psychology*, 38(5), 521. <https://doi.org/10.1123/jsep.2016-0052>
7. Gandrapu, A., & Rakesh, K. R. (2024). Sports Psychology: Mental Skills Training and Performance Enhancement Strategies for Athletes. *Innovations in Sports Science.*, 1(3), 1. <https://doi.org/10.36676/iss.v1.i3.13>
8. Herrero, C., Jejurikar, N., & Carter, C. W. (2021). The psychology of the female athlete: how mental health and wellness mediate sports performance, injury and recovery. *Annals of Joint*, 6, 38. <https://doi.org/10.21037/aoj-20-53>
9. Josefsson, T., Ivarsson, A., Lindwall, M., Gustafsson, H., Stenling, A., Böröy, J., Mattsson, E., Carnebratt, J., Sevholt, S., & Falkevik, E. (2017). Mindfulness Mechanisms in Sports: Mediating Effects of Rumination and Emotion Regulation on Sport-Specific Coping. *Mindfulness*, 8(5), 1354. <https://doi.org/10.1007/s12671-017-0711-4>
10. Küttel, A., Schmid, J., Boyle, E., Schmid, O., & Seiler, R. (2015). Successful transition out of elite sport: what is the influence of the national context? *Research Portal Denmark*, 82. <https://local.forskningsportal.dk/local/dki-cgi/ws/cris-link?src=sdu&id=sdu-e44d87a6-bd17-4e90-987c-4a1c475afa28&ti=Successful%20transition%20out%20of%20elite%20sport%20%3A%20what%20is%20the%20influence%20of%20the%20national%20context%3F>
11. Lange-Smith, S., Cabot, J., Coffee, P., Gunnell, K. E., & Tod, D. (2023). The efficacy of psychological skills training for enhancing performance in sport: a review of reviews [Review of *The efficacy of psychological skills training for enhancing performance in sport: a review of reviews*]. *International Journal of Sport and Exercise Psychology*, 22(4), 1012. Taylor & Francis. <https://doi.org/10.1080/1612197x.2023.2168725>
12. Lewis, K. J., Walton, C. C., Slemp, G. R., & Osborne, M. S. (2022). Mindfulness and Nonattachment-To-Self in Athletes: Can Letting Go Build Well-being and Self-actualization? *Mindfulness*, 13(11), 2738. <https://doi.org/10.1007/s12671-022-01990-9>

13. Li, G. (2024). Exploration of the biological basis and training strategies for building athletes' psychological resilience. *Molecular & Cellular Biomechanics*, 21(3), 470. <https://doi.org/10.62617/mcb470>
14. Myall, K., Montero-Marín, J., Gorczynski, P., Kajee, N., Sheriff, R. S., Bernard, R., Harriss, E., & Kuyken, W. (2022). Effect of mindfulness-based programmes on elite athlete mental health: a systematic review and meta-analysis [Review of *Effect of mindfulness-based programmes on elite athlete mental health: a systematic review and meta-analysis*]. *British Journal of Sports Medicine*, 57(2), 99. BMJ. <https://doi.org/10.1136/bjsports-2022-105596>
15. Pandian, P. R. S., Kumar, V. B., Kannan, M., Gurusamy, G., & Lakshmi, B. (2022). Impact of mental toughness on athlete's performance and interventions to improve [Review of *Impact of mental toughness on athlete's performance and interventions to improve*]. *Journal of Basic and Clinical Physiology and Pharmacology*, 34(4), 409. De Gruyter. <https://doi.org/10.1515/jbcpp-2022-0129>
16. Park, I., & Jeon, J. (2023). Psychological Skills Training for Athletes in Sports: Web of Science Bibliometric Analysis. *Healthcare*, 11(2), 259. <https://doi.org/10.3390/healthcare11020259>
17. Reinebo, G., Alfonsson, S., Jansson-Fröjmark, M., Rozental, A., & Lundgren, T. (2023). Effects of Psychological Interventions to Enhance Athletic Performance: A Systematic Review and Meta-Analysis [Review of *Effects of Psychological Interventions to Enhance Athletic Performance: A Systematic Review and Meta-Analysis*]. *Sports Medicine*, 54(2), 347. Springer Science+Business Media. <https://doi.org/10.1007/s40279-023-01931-z>
18. Reyes-Bossio, M., Corcueras-Bustamante, S., Veliz-Salinas, G., Boas, M. V., Delgado-Campusano, M., Brocca-Alvarado, P., Caycho-Rodríguez, T., Casas-Apayco, L., Vallarino, V. T., Carbajal-León, C., & Brandão, M. R. F. (2022). Effects of psychological interventions on high sports performance: A systematic review [Review of *Effects of psychological interventions on high sports performance: A systematic review*]. *Frontiers in Psychology*, 13. Frontiers Media. <https://doi.org/10.3389/fpsyg.2022.1068376>
19. Robazza, C., Vitali, F., Bortoli, L., & Ruiz, M. C. (2024). Cognitive appraisals linking dispositional mindfulness to athletes' emotions: a multi-states theory approach. *Frontiers in Sports and Active Living*, 6. <https://doi.org/10.3389/fspor.2024.1521613>
20. Rogowska, A. M., & Tataruch, R. (2024). The relationship between mindfulness and athletes' mental skills may be explained by emotion regulation and self-regulation. *BMC*

Sports Science Medicine and Rehabilitation, 16(1). <https://doi.org/10.1186/s13102-024-00863-z>

21. Ronkainen, H., Lundgren, T., Kenttä, G., Ihälainen, J. K., Valtonen, M., & Lappalainen, R. (2024). Psychological Flexibility Skills and Mental Wellbeing in Athletes: An Exploration of Associations and Gender Differences. *Psychology and Behavioral Sciences*, 13(2), 43. <https://doi.org/10.11648/j.pbs.20241302.14>

22. Röthlin, P., Horvath, S., Trösch, S., Holtforth, M. G., & Birrer, D. (2020). Differential and shared effects of psychological skills training and mindfulness training on performance-relevant psychological factors in sport: a randomized controlled trial. *BMC Psychology*, 8(1). <https://doi.org/10.1186/s40359-020-00449-7>

23. Sánchez-Sánchez, L. C., Franco, C., Amutio, A., Silva, J. G. da, & Hernández, J. G. (2023). Influence of Mindfulness on Levels of Impulsiveness, Moods and Pre-Competition Anxiety in Athletes of Different Sports. *Healthcare*, 11(6), 898. <https://doi.org/10.3390/healthcare11060898>

24. Schmid, M. J., Küttel, A., Charbonnet, B., Rivero, T., Schmid, J., Ronkainen, N. J., & Conzelmann, A. (2024). A Scoping Review on the Theoretical and Methodological Advances in the Study of Retirement From Elite Sport [Review of *A Scoping Review on the Theoretical and Methodological Advances in the Study of Retirement From Elite Sport*]. *Research Portal Denmark*. Technical University of Denmark. <https://local.forskningsportal.dk/local/dki-cgi/ws/cris-link?src=sdu&id=sdu-27519d0a-a6eb-46dd-a5a0-843b4ede86a9&ti=A%20Scoping%20Review%20on%20the%20Theoretical%20and%20Methodological%20Advances%20in%20the%20Study%20of%20Retirement%20From%20Elite%20Sport>

25. Stoyanova, S., Ivantchev, N., Gergov, T., & Yordanova, B. (2025). Mental Resilience and Mindfulness in Athletes: A Preliminary Study Across Sports and Experience Levels. *Sports*, 13(10), 334. <https://doi.org/10.3390/sports13100334>

26. Su, N., Si, G., Liang, W., Bu, D., & Jiang, X. (2024). Mindfulness and acceptance-based training for elite adolescent athletes: a mixed-method exploratory study. *Frontiers in Psychology*, 15. <https://doi.org/10.3389/fpsyg.2024.1401763>

27. Tang, Y., Jing, L., Liu, Y., & Wang, H. (2023). Association of mindfulness on state-trait anxiety in choking-susceptible athletes: mediating roles of resilience and perceived stress. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1232929>

28. Vealey, R. S. (2023). A framework for mental training in sport: Enhancing mental skills, wellbeing, and performance. *Journal of Applied Sport Psychology*, 36(2), 365. <https://doi.org/10.1080/10413200.2023.2274459>

29. Walsh, A. (2023). Mental skills training in elite sports environments: Current status of integration. *The Journal of Sport and Exercise Science*, 7(2), 1. <https://doi.org/10.36905/jses.2023.02.01>

30. Wang, Y., Lei, S., & Fan, J. (2023). Effects of Mindfulness-Based Interventions on Promoting Athletic Performance and Related Factors among Athletes: A Systematic Review and Meta-Analysis of Randomized Controlled Trial [Review of *Effects of Mindfulness-Based Interventions on Promoting Athletic Performance and Related Factors among Athletes: A Systematic Review and Meta-Analysis of Randomized Controlled Trial*]. *International Journal of Environmental Research and Public Health*, 20(3), 2038. Multidisciplinary Digital Publishing Institute. <https://doi.org/10.3390/ijerph20032038>

31. Wei, X., Yang, Z., & Feng, X. (2024). A meta-analysis of the intervention effect of mindfulness training on athletes' performance. *Frontiers in Psychology*, 15. <https://doi.org/10.3389/fpsyg.2024.1375608>

32. Wu, C., Nien, J., Lin, C.-Y., Nien, Y.-H., Kuan, G., Wu, T.-Y., Ren, F.-F., & Chang, Y. (2021). Relationship between Mindfulness, Psychological Skills, and Mental Toughness in College Athletes. *International Journal of Environmental Research and Public Health*, 18(13), 6802. <https://doi.org/10.3390/ijerph18136802>

33. Yang, Y., Du, X., Liu, X., Li, P., He, S., Leng, L., & Huang, J. (2025). Effects of Mindfulness Intervention on Cognitive Function in Athletes: A Systematic Review and Meta-Analysis [Review of *Effects of Mindfulness Intervention on Cognitive Function in Athletes: A Systematic Review and Meta-Analysis*]. *Mindfulness*. Springer Science+Business Media. <https://doi.org/10.1007/s12671-025-02634-4>

34. Zhang, J., Sun, J., Zhou, Y., Gong, L., & Huang, S. (2025). The effect of mindfulness training on the psychological state of high-level athletes: Meta analysis and system evaluation research [Review of *The effect of mindfulness training on the psychological state of high-level athletes: Meta analysis and system evaluation research*]. *Journal of Sports Sciences*, 1. Taylor & Francis. <https://doi.org/10.1080/02640414.2025.2468997>