International Journal of Food Safety and Public Health ISSN 2756-3693 Vol. 11 (1), pp. 001-009, March, 2024. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

Studying Mindfulness Methods And Their Impact On Attention And Performance In Student Sports Participants

Kanhaiya Lal Sonker[1], Dr. Ajay Telang[2]

Research Scholar, Department of Physical Education, SSSUTMS, Sehore[1]

Associate Professor, Department of Physical Education, SSSUTMS, Sehore[2]

Accepted 12th February, 2024

ABSTRCT

The present study investigates the relationship between mindfulness methods and their influence on attention and performance among student sports participants. The primary objective was to examine whether structured mindfulness interventions enhance attentional capabilities and athletic performance in collegiate athletes. A quasi-experimental research design was employed involving 120 student athletes aged 18-25 years from various sports disciplines, selected through purposive sampling technique. The Mindful Attention Awareness Scale and Five Facet Mindfulness Questionnaire were administered along with standardized attention and performance assessment tools. It was hypothesized that students receiving mindfulness training would demonstrate significantly improved attention scores and athletic performance compared to control groups. Results revealed that mindfulness intervention groups showed substantial improvements in sustained attention, selective attention, and overall sports performance metrics. Statistical analysis indicated significant positive correlations between mindfulness scores and performance outcomes. The findings suggest that integrating mindfulness-based training into athletic programs can effectively enhance cognitive functioning and competitive performance among student athletes.

Keywords: *Mindfulness, Attention, Sports Performance, Student Athletes, Meditation*

1. INTRODUCTION

Mindfulness has emerged as a significant psychological construct in contemporary sports psychology research, garnering substantial attention from practitioners and researchers worldwide. Kabat-Zinn defines mindfulness operationally as the awareness that arises by paying attention on purpose, in the present moment, and non-judgmentally. This

foundational definition has guided numerous investigations into how present-moment awareness influences athletic outcomes. The integration of mindfulness practices into sports training represents a paradigm shift from traditional psychological skills training approaches that primarily focused on controlling or modifying cognitive and affective states (Gardner & Moore, 2007; Birrer et al., 2012). Student athletes face unique challenges balancing academic responsibilities with competitive sports demands, often experiencing elevated stress levels that can impair both cognitive functioning and athletic performance (Anderson et al., 2021). Research indicates mindfulness can enhance physical activity and sports performance. Mindfulness is a mental state achieved by focusing on the present moment and accepting one's feelings, thoughts, and bodily sensations without judgment or evaluation. The cultivation of mindfulness skills enables athletes to maintain focus during high-pressure situations while reducing performance anxiety and enhancing emotional regulation capabilities (Bühlmayer et al., 2017).

Mindfulness meditation is able to improve attentional resource allocation, enhance working memory and executive ability, and improve attention levels and motor skills. These cognitive enhancements are particularly relevant for student athletes who must demonstrate sustained concentration during both academic pursuits and competitive events. The theoretical foundation linking mindfulness to enhanced performance draws upon attention control theory and the integrated model of sports performance, which emphasize the critical role of cognitive resources in achieving optimal athletic outcomes (Sun & Li, 2021; Noetel et al., 2019). The present investigation addresses a gap in existing literature by examining the specific mechanisms through which mindfulness methods influence attention and performance in student sports participants within educational settings.

2. LITERATURE REVIEW

The scientific investigation of mindfulness in athletic contexts has evolved considerably since the pioneering work establishing mindfulness-based stress reduction programs (Kabat-Zinn, 1990). The Mindfulness Attention Awareness Scale was developed by Brown and Ryan in 2003 and focused on the attention and awareness aspects of mindlessness. This instrument has become foundational for assessing dispositional mindfulness among athletic populations and has demonstrated strong psychometric properties across diverse samples (MacKillop & Anderson, 2007; Black et al., 2012). Gardner and Moore developed a mindfulness and acceptance-based intervention program for performance enhancement, called the Mindfulness-Acceptance-Commitment approach. This manualized program emphasizes nonjudgmental attention to present realities and the development of self-regulated attention, which is linked with optimal performance. The MAC protocol represents one of the most empirically validated approaches specifically designed for athletic populations, demonstrating effectiveness in enhancing flow states, reducing competitive anxiety, and improving overall performance metrics (Moore, 2009; Josefsson et al., 2019).

Substantial evidence supports the relationship between mindfulness practice and attentional enhancement in athletes. Elite athletes tend to show higher mean scores in attentional and visuospatial tasks when compared with controls. A combination of dispositional mindfulness and cognitive training involved in sports

practice may explain that both experimental and control groups showed high levels of attentional control. Research by Baltar and Filgueiras (2018) demonstrated that mindfulness meditation maintained attentional control among football players during off-season periods when cognitive abilities typically decline. The Mindful Sport Performance Enhancement program developed by Kaufman and colleagues has shown promising results among collegiate athletes. Research has suggested that mindfulness can help combat stress, increase self-compassion, and improve well-being. Multiple mixed-design ANOVAs revealed significant reductions in sport anxiety as well as significant improvements on self-ratings of satisfaction with both attention/emotion regulation and physical sport performance. These findings align with meta-analytic evidence suggesting medium-to-large effect sizes for mindfulness interventions on performance-related psychological outcomes (Wang et al., 2023).

Experienced meditators or those who received mindfulness meditation training demonstrated better information processing speeds in attention tasks or vigilance tasks, suggesting the beneficial effect of mindfulness on basic levels of cognitive function. Neuroimaging studies have revealed structural and functional changes in brain regions associated with attention regulation following mindfulness training, providing biological evidence for observed behavioral improvements (Hölzel et al., 2011; Nien et al., 2020). The relationship between mindfulness and psychological skills essential for athletic success has been extensively documented. Numerous studies have shown that dispositional mindfulness is positively associated with many mental abilities related to sports performance, including psychological skills and mental toughness. Tingaz and colleagues (2021) reported significant positive correlations between mindfulness scores and self-compassion among student-athletes, suggesting broader psychological benefits beyond attention enhancement.

3. OBJECTIVES

1. To assess the baseline mindfulness levels among student sports participants across different athletic disciplines.
2. To evaluate the effectiveness of structured mindfulness intervention programs on attentional capabilities including sustained attention, selective attention, and attention stability.
3. To examine the relationship between mindfulness training and athletic performance outcomes in student sports participants.
4. To compare the differential effects of mindfulness methods on individual versus team sport athletes.

4. METHODOLOGY

The present investigation employed a quasi-experimental research design with pre-test and post-test assessments to examine the effects of mindfulness training on attention and performance among student athletes. The study was conducted over a 12-week period incorporating baseline assessment, 8-week intervention phase, and post-intervention evaluation. The research design allowed for systematic comparison between experimental and control groups while accounting for individual differences in baseline mindfulness levels and athletic experience. The sample comprised 120 student athletes aged 18-25 years selected through purposive sampling from collegiate athletic programs. Participants represented diverse sports disciplines including athletics, racket

sports, team ball games, and combat sports. Inclusion criteria required active participation in competitive sports training for minimum two years with no prior formal mindfulness meditation experience. Participants were randomly assigned to experimental group receiving mindfulness intervention or control group maintaining regular training routines.

Assessment tools included the Mindful Attention Awareness Scale developed by Brown and Ryan (2003) comprising 15 items measuring dispositional mindfulness on 6-point Likert scale with higher scores indicating greater mindfulness. The Five Facet Mindfulness Questionnaire assessed observing, describing, acting with awareness, non-judging, and non-reactivity facets. Attention was measured using standardized psychometric instruments assessing sustained attention, selective attention, and attention stability parameters. Athletic performance was evaluated through coach-rated performance scales and objective performance metrics specific to each sport discipline. The mindfulness intervention followed the Mindfulness-Acceptance-Commitment protocol adapted for athletic populations, consisting of seven structured sessions delivered weekly over the intervention period. Sessions incorporated mindfulness meditation practice, body scan exercises, breathing awareness techniques, and acceptance-based cognitive strategies. Data analysis employed descriptive statistics, paired and independent samples t-tests, correlation analysis, and analysis of covariance to examine intervention effects while controlling for baseline differences.

5. RESULT AND DISCUSSION

Table 1: Demographic Characteristics of Student Athletes (N=120)

Variable	Category	Experimental Group (n=60)	Control Group (n=60)
Age (Mean±SD)	Years	21.45±2.12	21.68±2.08
Gender	Male	38 (63.3%)	36 (60.0%)
	Female	22 (36.7%)	24 (40.0%)
Sport Type	Individual	28 (46.7%)	30 (50.0%)
	Team	32 (53.3%)	30 (50.0%)
Training Experience	2-4 years	34 (56.7%)	32 (53.3%)
	>4 years	26 (43.3%)	28 (46.7%)

The demographic analysis presented in Table 1 reveals comparable distribution of participant characteristics across experimental and control groups. The mean age of participants was approximately 21.5 years with balanced gender representation reflecting typical collegiate athletic populations. Sport type distribution demonstrated equal representation of individual and team sport athletes enabling comparative analysis of mindfulness effects across athletic contexts.

Table 2: Pre-test and Post-test Comparison of Mindfulness Scores (MAAS)

Group	Pre-test Mean±SD	Post-test Mean±SD	t-value	p-value
Experimental	3.42±0.68	4.28±0.54	8.46	<0.001
Control	3.38±0.72	3.52±0.69	1.24	0.219

Between-group difference			6.82	<0.001

Table 2 demonstrates significant improvement in mindfulness scores among experimental group participants following the intervention program. The experimental group showed substantial increase from pre-test to post-test scores on the Mindful Attention Awareness Scale whereas control group demonstrated minimal non-significant change. These findings align with previous research indicating that structured mindfulness programs effectively enhance dispositional mindfulness among athletic populations within relatively brief intervention periods (Josefsson et al., 2019; Glass et al., 2019).

Table 3: Five Facet Mindfulness Questionnaire Scores Pre and Post Intervention

FFMQ Facet	Group	Pre-test Mean±SD	Post-test Mean±SD	Effect Size (d)
Observing	Experimental	24.82±4.21	28.45±3.86	0.89
	Control	24.56±4.18	25.12±4.08	0.14
Describing	Experimental	25.18±3.92	28.72±3.54	0.94
	Control	25.24±3.88	25.68±3.82	0.11
Acting Awareness	Experimental	26.42±4.08	31.28±3.72	1.24
	Control	26.28±4.12	26.84±4.02	0.14
Non-judging	Experimental	23.86±4.52	27.94±4.18	0.93
	Control	23.92±4.48	24.38±4.42	0.10
Non-reactivity	Experimental	22.48±3.86	26.12±3.62	0.97
	Control	22.52±3.82	22.98±3.78	0.12

Table 3 presents comprehensive analysis of changes across all five facets of mindfulness measured by the FFMQ. The experimental group demonstrated large effect sizes across all facets with particularly pronounced improvements in acting with awareness, a facet critically relevant to athletic performance requiring present-moment concentration. The findings support theoretical propositions that mindfulness training enhances multiple dimensions of self-awareness simultaneously contributing to overall psychological functioning improvement among athletes (Baer et al., 2006; Bühlmayer et al., 2017).

Table 4: Attention Parameters Before and After Mindfulness Intervention

Attention Measure	Group	Pre-test Mean±SD	Post-test Mean±SD	t-value	p-value
Sustained Attention	Experimental	68.42±8.24	78.86±7.12	7.82	<0.001
	Control	68.18±8.32	69.42±8.18	0.98	0.332
Selective Attention	Experimental	72.24±7.86	81.18±6.94	7.24	<0.001
	Control	72.48±7.78	73.26±7.68	0.72	0.475
Attention Stability	Experimental	65.86±9.12	76.42±7.86	7.56	<0.001
	Control	65.92±9.08	66.84±8.92	0.68	0.499

Table 4 reveals significant improvements in all attention parameters among experimental group participants with highly significant statistical differences compared to control group. Sustained attention showed marked enhancement enabling athletes to maintain concentration over extended competitive periods. These improvements align with neuropsychological evidence demonstrating mindfulness effects on executive attention networks and prefrontal cortical functioning associated with cognitive control processes (Nien et al., 2020; van den Hurk et al., 2010).

Table 5: Athletic Performance Scores Pre and Post Intervention

Performance Measure	Group	Pre-test Mean±SD	Post-test Mean±SD	% Improvement
Coach Rating	Experimental	6.82±1.24	8.14±0.98	19.35%
	Control	6.78±1.28	6.92±1.22	2.06%
Self-rated Performance	Experimental	6.54±1.32	7.86±1.08	20.18%
	Control	6.48±1.36	6.62±1.32	2.16%
Technical Execution	Experimental	7.12±1.18	8.28±0.94	16.29%
	Control	7.08±1.22	7.18±1.18	1.41%

Table 5 demonstrates substantial improvements in athletic performance measures among experimental group participants with approximately 19-20% improvement in coach-rated and self-rated performance scores. The control group showed minimal improvement indicating that observed changes in experimental group were attributable to mindfulness intervention rather than training effects alone. Performance improvements corroborate theoretical models proposing that enhanced present-moment awareness facilitates optimal athletic functioning through improved emotional regulation and reduced performance anxiety (Gardner & Moore, 2012; Scott-Hamilton et al., 2016).

Table 6: Correlation Matrix Between Mindfulness, Attention, and Performance Variables

Variable	1	2	3	4	5
1. MAAS Score	1.00				
2. FFMQ Total	0.72**	1.00			
3. Sustained Attention	0.58**	0.62**	1.00		
4. Selective Attention	0.54**	0.56**	0.68**	1.00	
5. Performance Score	0.48**	0.52**	0.64**	0.58**	1.00

**p<0.01

Table 6 presents significant positive correlations among mindfulness measures, attention parameters, and performance outcomes. Strong correlations between MAAS and FFMQ scores indicate convergent validity of mindfulness assessment. Attention variables demonstrated moderate-to-strong correlations with performance scores supporting the theoretical proposition that attentional enhancement mediates mindfulness effects on athletic performance. These correlational patterns align with integrated models proposing attention as a critical pathway linking mindfulness practice to performance outcomes

in competitive sports (Birrer et al., 2012; Moran, 2010).

6. CONCLUSION

The present investigation provides compelling evidence supporting the efficacy of mindfulness methods in enhancing attention and performance among student sports participants. The findings demonstrate that structured mindfulness intervention programs significantly improve dispositional mindfulness across multiple facets, enhance various attention parameters including sustained attention, selective attention, and attention stability, and contribute to meaningful improvements in athletic performance outcomes. The theoretical implications align with contemporary models emphasizing present-moment awareness and acceptance-based approaches as effective alternatives to traditional psychological skills training for athletic performance enhancement. Student athletes receiving mindfulness training showed approximately 19-20% improvement in performance ratings compared to minimal changes in control groups, suggesting practical significance for competitive athletics. The significant correlations observed between mindfulness, attention, and performance variables support the theoretical proposition that attention enhancement represents a key mechanism through which mindfulness practice influences athletic outcomes. Educational institutions and athletic programs should consider integrating mindfulness-based interventions into comprehensive athlete development programs to optimize both cognitive functioning and competitive performance among student sports participants.

REFERENCES

1. Anderson, S. A., Haraldsdottir, K., & Watson, D. (2021). Mindfulness in athletes. *Current Sports Medicine Reports*, 20(12), 655-660. https://doi.org/10.1249/JSR.0000000000000919
2. Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, 13(1), 27-45. https://doi.org/10.1177/1073191105283504
3. Baltar, Y. C., & Filgueiras, A. (2018). The effects of mindfulness meditation on attentional control during off-season among football players. *SAGE Open*, 8(2), 1-11. https://doi.org/10.1177/2158244018781896
4. Birrer, D., Röthlin, P., & Morgan, G. (2012). Mindfulness to enhance athletic performance: Theoretical considerations and possible impact mechanisms. *Mindfulness*, 3(3), 235-246. https://doi.org/10.1007/s12671-012-0109-2
5. Black, D. S., Sussman, S., Johnson, C. A., & Milam, J. (2012). Psychometric assessment of the Mindful Attention Awareness Scale (MAAS) among Chinese adolescents. *Assessment*, 19(1), 42-52. https://doi.org/10.1177/1073191111415365
6. Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84(4), 822-848. https://doi.org/10.1037/0022-3514.84.4.822
7. Bühlmayer, L., Birrer, D., Röthlin, P., Faude, O., & Donath, L. (2017). Effects of mindfulness practice on performance-relevant parameters and performance outcomes in sports: A meta-analytical review. *Sports Medicine*, 47(11), 2309-2321. https://doi.org/10.1007/s40279-017-0752-9

8. Gardner, F. L., & Moore, Z. E. (2007). *The psychology of enhancing human performance: The mindfulness-acceptance-commitment (MAC) approach*. Springer Publishing Company.
9. Gardner, F. L., & Moore, Z. E. (2012). Mindfulness and acceptance models in sport psychology: A decade of basic and applied scientific advancements. *Canadian Psychology*, 53(4), 309-318. https://doi.org/10.1037/a0030220
10. Glass, C. R., Spears, C. A., Perskaudas, R., & Kaufman, K. A. (2019). Mindful sport performance enhancement: Randomized controlled trial of a mental training program with collegiate athletes. *Journal of Clinical Sport Psychology*, 13(4), 609-628. https://doi.org/10.1123/jcsp.2017-0044
11. Hölzel, B. K., Carmody, J., Vangel, M., Congleton, C., Yerramsetti, S. M., Gard, T., & Lazar, S. W. (2011). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research: Neuroimaging*, 191(1), 36-43. https://doi.org/10.1016/j.pscychresns.2010.08.006
12. Josefsson, T., Ivarsson, A., Gustafsson, H., Stenling, A., Lindwall, M., Tornberg, R., & Böröy, J. (2019). Effects of mindfulness-acceptance-commitment (MAC) on sport-specific dispositional mindfulness, emotion regulation, and self-rated athletic performance. *Mindfulness*, 10(8), 1518-1529. https://doi.org/10.1007/s12671-019-01098-7
13. Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. Delacorte Press.
14. MacKillop, J., & Anderson, E. J. (2007). Further psychometric validation of the Mindful Attention Awareness Scale (MAAS). *Journal of Psychopathology and Behavioral Assessment*, 29(4), 289-293. https://doi.org/10.1007/s10862-007-9045-1
15. Moore, Z. E. (2009). Theoretical and empirical developments of the Mindfulness-Acceptance-Commitment (MAC) approach to performance enhancement. *Journal of Clinical Sport Psychology*, 3(4), 291-302. https://doi.org/10.1123/jcsp.3.4.291
16. Moran, A. (2010). Concentration/attention. In S. J. Hanrahan & M. B. Andersen (Eds.), *Routledge handbook of applied sport psychology* (pp. 500-509). Routledge.
17. Nien, J. T., Wu, C. H., Yang, K. T., Cho, Y. M., Chu, C. H., Chang, Y. K., & Zhou, C. (2020). Mindfulness training enhances endurance performance and executive functions in athletes: An event-related potential study. *Neural Plasticity*, 2020, Article 8213710. https://doi.org/10.1155/2020/8213710
18. Noetel, M., Ciarrochi, J., Van Zanden, B., & Lonsdale, C. (2019). Mindfulness and acceptance approaches to sporting performance enhancement: A systematic review. *International Review of Sport and Exercise Psychology*, 12(1), 139-175. https://doi.org/10.1080/1750984X.2017.1387803
19. Scott-Hamilton, J., Schutte, N. S., & Brown, R. F. (2016). Effects of a mindfulness intervention on sports-anxiety, pessimism, and flow in competitive cyclists. *Applied Psychology: Health and Well-Being*, 8(1), 85-103. https://doi.org/10.1111/aphw.12063
20. Sun, G. X., & Li, W. (2021). Theoretical evolution of the relationship between competition pressure, attention control and sports

performance. *Advances in Psychological Science*, 29(6), 1122-1130. https://doi.org/10.3724/SP.J.1042.2021.01122

21. Tingaz, E. O., Ekiz, M. A., & Çakmak, S. (2021). Mindfulness, self-compassion, and athletic performance in student-athletes. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, 40(3), 554-568. https://doi.org/10.1007/s10942-021-00434-y
22. van den Hurk, P. A., Giommi, F., Gielen, S. C., Speckens, A. E., & Barendregt, H. P. (2010). Greater efficiency in attentional processing related to mindfulness meditation. *Quarterly Journal of Experimental Psychology*, 63(6), 1168-1180. https://doi.org/10.1080/17470210903249365
23. Wang, Y., Lei, S. M., & 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 trials. *International Journal of Environmental Research and Public Health*, 20(3), 1798. https://doi.org/10.3390/ijerph20031798