

Effectiveness of Mindfulness Program in Improving Wushu Focus

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Abstract

Objectives. The objective of this study was to examine the effectiveness of a mindfulness program in improving the focus of adolescent wushu athletes. Given the cognitive demands of wushu, where concentration and mental stability are essential for technical execution, this research aimed to provide empirical evidence on the use of mindfulness as a psychological intervention. Although mindfulness has been widely studied in sports like archery, swimming, and tennis, research on its application in wushu remains extremely limited. The study thus sought to fill this gap by addressing the unique mental and motor challenges faced by wushu athletes.

Materials and Methods. This study employed a pre-experimental design using a one-group pretest-posttest approach. The participants were 23 senior wushu athletes from East Java, aged 16–20 years, with at least two years of training experience. The intervention consisted of a four-week mindfulness program conducted three times per week, with each session lasting 30 minutes. The program included guided practices such as mindful breathing, body scan meditation, and awareness of movement, delivered by a certified mindfulness instructor. Focus levels were assessed using the validated Attention Control Scale before and after the intervention. Data were analyzed using SPSS with descriptive statistics, normality tests, paired sample t-tests, and Pearson correlation.

Results. The findings revealed a significant increase in focus scores following the mindfulness intervention. The mean score improved from 60.30 in the pre-test to 75.91 in the post-test. The paired sample t-test showed a statistically significant difference ($p < 0.05$), with a very large effect size (Cohen's $d = 3.83$). Additionally, a strong positive correlation ($r = 0.981$, $p = 0.000$) was observed between pre-test and post-test scores, indicating consistent improvement among participants.

Conclusions. The study offers early proof that mindfulness training may be beneficial in helping wushu athletes improve their attentional control. More controlled research is advised to validate these findings because of the exploratory character of the study design. The study offers early proof that mindfulness training may be beneficial in helping wushu athletes improve their attentional control. More controlled research is advised to validate these findings because of the exploratory character of the study design. These findings support the integration of mindfulness as a viable and evidence-based strategy in performance coaching programs for martial arts athletes, particularly in sports requiring high cognitive and motor coordination such as wushu.

Keywords: Mindfulness, Focus, Wushu Athletes, Psychological Intervention, Mental Training

Introduction

Difficulty in maintaining focus during training and matches is a common problem faced by wushu athletes (Ying, 2024). Wushu relies on extremely high precision, speed, and control of movements (Guo & Choosakul, 2024). Steady mental focus is key in optimizing an athlete's ability to execute movements accurately and effectively. Without the ability to maintain attention to technical details for very short periods of time, an athlete's performance can be significantly affected. The focus of wushu athletes is affected by many things, distractions often come from the pressure of competition, psychological fatigue, and interference from the surrounding environment, which disrupt concentration during training and matches (Gandrapu, 2024). In addition, internal factors such as training anxiety and physical stress can also affect athletes' mental stability (Rathi et al., 2024). In these situations, the athlete's technical success and mental well-being improve as a result of a fixed focus (Mcleod & Singe, 2023).

Mindfulness, a rapidly growing psychological approach in the world of sport, has great potential to improve athletes' focus and mental well-being (Wang et al., 2023). Mindfulness teaches people to be fully present in the present moment with full awareness and without judgment (Murphy & Angelow, 2022). It has been shown to improve concentration, reduce stress, and enhance performance in various sports (Kim & Lawlor, 2023). Although mindfulness has been used in many sports, not much research has been done on how it is applied in wushu. This is because wushu faces its own problems in combining fighting arts and techniques.

Mental focus is a crucial element in achieving optimal performance in wushu (Manalu et al., 2024). Many wushu athletes have difficulty staying focused during training and while competing (Werner & Federolf, 2023). Physical and technical factors should be prioritized in wushu training, but psychological approaches to improve concentration such as mindfulness are still rarely used. Training programs that focus on physical development often neglect mental aspects, even though focus management is crucial to optimize technique and performance. In addition, very few studies have specifically examined how mindfulness can improve the focus of wushu athletes (Cece et al., 2020; Lopes, 2024; Patil, 2023). Current research has mostly focused on other sports, such as tennis, archery, and swimming, but not many studies have specifically examined the relationship between mindfulness and focus in wushu athletes.

There is very little research on mindfulness in martial arts-based sports, especially wushu. Previous research has mostly focused on tennis, archery and swimming athletes, which have different techniques and strategies than wushu. Wushu is unique in that it blends elements of art and combat, and requires a very high degree of mental focus to apply techniques correctly under high-pressure conditions. A more specialized mindfulness approach tailored to the cognitive and emotional nature of wushu athletes is needed. Approaches that work for other sports may also need to be adapted to meet the specific challenges wushu athletes face.

The use of mindfulness therapies in sports like tennis, swimming, and archery is growing, but there isn't much empirical research that focus on wushu particularly. This omission is troubling since wushu, which combines creative expression with combat technique, poses unique cognitive and psychomotor demands. By directly connecting mindfulness practices to increased focus in wushu athletes, this study offers a fresh contribution. This is especially crucial while practicing wushu, which calls for a blend of expressive movement, rhythm, and precise motor control. Athletes can improve their proprioceptive awareness, kinaesthetic control, and attentional stability throughout intricate routines by implementing mindfulness practices like body scan meditation and movement-based awareness. Because of these modifications, mindfulness is particularly pertinent to martial arts like wushu, where concentration is required under both performative and technical demands.

This study aims to determine how effective mindfulness programs are in improving the focus of wushu athletes. It is hoped that this study will provide empirical evidence supporting the use of mindfulness as an effective psychological method to improve the mental performance of wushu athletes. In addition, this study also aims to provide evidence-based recommendations on how to implement self-awareness programs in wushu training routines at different levels. The fact that conventional wushu training emphasizes technical and physical mastery over structured psychological therapies may be one factor contributing to the paucity of studies on mindfulness in this sport. Furthermore, the majority of sport psychology's mindfulness research to date has been on sports like archery, swimming, and running that have performance outcomes that can be measured objectively. However, when assessing the effects of mental training programs like mindfulness, wushu's intricate routines and subjective evaluation standards could provide methodological difficulties. These background variables could account for the paucity of research in this area and emphasize the necessity of wushu-specific, customized methods.

Materials and Methods

Study Participants.

The study population consisted of senior wushu athletes from East Java who have participated in advanced training programs and competed at provincial and national levels. This population was chosen because senior athletes face high training loads and performance demands, making focus management critical for their success. A purposive sampling technique was applied to select 23 athletes aged between 16 and 20 years old, each with a minimum training experience of two years, to ensure alignment with the research objectives.

Study organization.

This research employed a pre-experimental design with a one-group pretest-posttest approach, suitable for evaluating the effects of an intervention on the same group without a control. The intervention was a mindfulness program aimed at improving focus among wushu athletes. The program lasted four weeks, conducted three times per week, with each session lasting 30 minutes. A certified instructor experienced in mindfulness techniques for athletes led the sessions. The program included mindful breathing exercises, body awareness meditation, observation of thoughts without reaction, and body movement awareness exercises, all tailored to the needs of wushu athletes requiring high focus and motor control. Due to limited participant availability throughout the intervention time and ethical considerations, this one-group design was selected. This experimental technique permits an early evaluation of the program's efficacy despite the absence of a control group.

During the four weeks of the mindfulness regimen, there was a set weekly plan with three 30-minute sessions. The following activities were part of each session: (1) 5 minutes of mindful breathing; (2) 10 minutes of standing body scan meditation with an emphasis on muscle sensations; (3) 10 minutes of movement awareness during 50% speed taolu sequences; and (4) 5 minutes of reflective stillness. Using a standardised script that was adjusted for sports by adding movement-based signals and derived on Kabat-Zinn's MBSR approach, a qualified instructor guided each session. Included in the supplemental materials is an example meditation script.

The Attention Control Scale (ACS) was used as the measurement instrument to assess participants' level of attention control. The ACS, which ranges from 0 to 100, is a validated psychological tool widely used in sport psychology to measure focus. It was administered twice, before (pre-test) and after (post-test) the mindfulness program.

Statistical analysis.

Data were analyzed using the latest version of SPSS software. Descriptive statistics such as mean, standard deviation, minimum, and maximum values were calculated to summarize data characteristics. Normality of the data was tested using Kolmogorov-Smirnov and Shapiro-Wilk tests to confirm suitability for parametric testing. The effectiveness of the mindfulness program was assessed using a paired sample t-test comparing pre-test and post-test scores. Statistical significance was set at $p < 0.05$.

Results

The purpose of this study was to determine the effectiveness of a mindfulness program in improving the focus of wushu athletes. Measurements were taken before (pre-test) and after (post-test) the program to assess changes in focus levels. The descriptive analysis showed that the intervention increased focus scores. The descriptive statistics are presented in Table 1.

Table 1 Descriptive Statistics of Wushu Athletes' Focus Before and After the Mindfulness Program

Statistics	Pre-Test Fokus	Post-Test Fokus
N	23	23
Mean	60,30	75,91
Median	60,00	76,00
Standard Deviation	3,28	4,58
Minimum	54	68
Maximum	66	84
Skewness	-0,12	-0,04
Kurtosis	-0,70	-0,89

Based on Table 1, the descriptive analysis shows a significant increase in focus among wushu athletes after participating in the mindfulness program. The mean pre-test focus score was 60.30 with a standard deviation of 3.28, while the post-test mean increased to 75.91 with a standard deviation of 4.58. The minimum and maximum pre-test scores were 54 and 66, respectively, while the post-test scores increased to 68 and 84. This improvement shows a clear difference between the conditions before and after the intervention.

Next, a normality test was conducted to ensure that the data met the assumption of normal distribution as a requirement for parametric testing. The results of the Kolmogorov-Smirnov and Shapiro-Wilk tests are presented in Table 2.

Table 2 Normality Test for Focus Scores in Pre-Test and Post-Test

Variabel	Kolmogorov-Smirnov (Sig.)	Shapiro-Wilk (Sig.)
Pre-Test Focus	0,200	0,899
Post-Test Focus	0,200	0,778

The normality test using Kolmogorov-Smirnov and Shapiro-Wilk showed that the data were normally distributed. The significance values in the pre-test were 0.200 (Kolmogorov-Smirnov) and 0.899 (Shapiro-Wilk), while the post-test values were 0.200 and 0.778. Since all significance values exceeded 0.05, it can be concluded that the data were normally distributed, and parametric statistical tests could be applied.

A paired sample t-test was then conducted to determine whether the difference in focus scores before and after the intervention was statistically significant. The results are shown in Table 3.

Table 3 Paired Sample t-Test for Wushu Athletes' Focus Before and After the Mindfulness Program

Variabel	Mean Difference	SD	SE	t	df	Sig. (2-tailed)
Post-Test – Pre-Test Focus	15,61	1,50	0,313	-49,915	22	0,000

The paired sample t-test showed a highly significant difference between the focus scores before and after participating in the mindfulness program. The average difference between the pre-test and post-test was -15.61, with a t-value of -49.915 and degrees of freedom (df) = 22. The significance value (p-value) of 0.000 indicates that this difference is statistically significant ($p < 0.05$). Furthermore, the effect size calculated using Cohen's d was 3.92, indicating that the mindfulness program had a very large effect on increasing the focus of the wushu athletes.

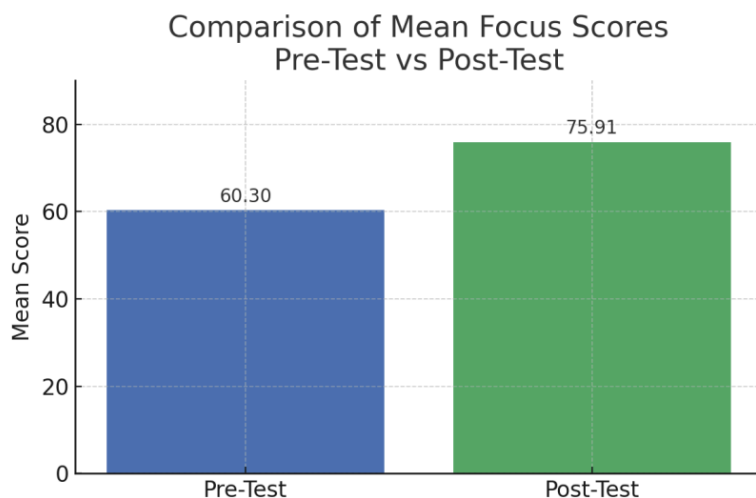
In addition, a correlation analysis was conducted to examine the relationship between pre-test and post-test scores. The results are presented in Table 4.

Table 4 Correlation Between Pre-Test and Post-Test Focus Scores

Variabel	N	Korelasi (r)	Sig.
Fokus Pre-Test & Post-Test	23	0,981	0,000

The very high correlation value indicates that although a significant increase occurred, the post-test focus scores remained strongly related to the initial scores, suggesting a consistent pattern in the participants' responses to the intervention.

A visualization comparing the average focus scores before and after the intervention is presented in Figure 1. The bar chart shows a clear increase, supporting the statistical test results previously described. The average focus score increased from 60.30 in the pre-test to 75.91 in the post-test, visually confirming the effectiveness of the mindfulness program in improving focus among wushu athletes.



Discussion

The findings of this study indicate that a self-awareness program has a significant effect on improving the focus of adolescent wushu athletes. The planned four-week intervention successfully improved participants' attention abilities, which was demonstrated by an increase in focus scores after the program. This improvement suggests that mindfulness is not only relevant in the context of sport psychology, but can also help the performance of technically and emotionally complex martial arts athletes using effective methods. Mindfulness encourages people to be fully present in the moment, focus on the task at hand without judging, and helps reduce automatic responses to distractions (Henriksen et al., 2020; Zhang et al., 2021).

Mindfulness training has been shown to improve attention regulation, reduce cognitive rumination, and increase mental engagement in sporting tasks (Rogowska & Tataruch, 2024). Athletes who follow mindfulness programs are more likely to maintain an

ideal mental state during practice and matches (Aguss et al., 2021). Similar studies have been found in other sports fields. For example, a study conducted by (Mertens et al., 2022), found that being self-aware improved adolescents' concentration and emotional control; this suggests that the benefits of self-awareness are cross-disciplinary and can be applied to different types of sports.

Mindfulness techniques were modified to meet the demands of wushu, which involves explosive physical motions, rhythmic sequences, and expressive motor coordination. Breath synchronization with form execution, standing-body scans, and movement awareness were the main foci of the intervention. These elements, which integrate physical execution with cognitive engagement, were rehearsed over slow-form repetitions while paying close attention to muscle tension, joint alignment, and breathing patterns. They directly mirror the technical difficulty of wushu.

Wushu is a sport that demands high mental stability because it combines speed, strength, aesthetics, and accuracy of movement (Mei & Yuan, 2024). Success in using techniques depends on the ability to stay focused (Krebs et al., 2023). Mindfulness helps athletes stay focused and aware while performing highly precise movements (Valentine et al., 2024). Athletes risk making technical errors when their focus is distracted, which reduces the quality of their movements and performance (Bull et al., 2023). Consequently, mindfulness training can serve as a foundation for improving motor control and technical coordination in martial sports (Matsumiya, 2021). The highly effective, albeit relatively short, mindfulness intervention shows that time is not the sole factor determining the success of the program; more important is the consistency and structure of the exercises applied (Calcagni et al., 2021). It is evident that three sessions per week for 30 minutes are sufficient to produce significant psychological changes. These results are in line with research (Nien et al., 2020), which states that short-duration mindfulness programs can be beneficial if conducted intensively and according to the needs of athletes.

One key limitation of this study is the absence of a control group, which restricts the ability to attribute observed changes solely to the intervention. Future studies are recommended to employ randomized controlled trials to improve internal validity and isolate the specific effects of mindfulness training. Mindfulness techniques were modified to meet the demands of wushu, which involves explosive physical motions, rhythmic sequences, and expressive motor coordination. Breath synchronization with form execution, standing-body scans, and movement awareness were the main foci of the intervention. These elements, which integrate physical execution with cognitive engagement, were rehearsed over slow-

form repetitions while paying close attention to muscle tension, joint alignment, and breathing patterns. They directly mirror the technical difficulty of wushu. Although the teacher oversaw every session, no official checklist or adherence log was kept to confirm participant compliance outside of attendance. This is recognised as a drawback. To more accurately gauge the degree of mindfulness engagement during training, future research should use compliance monitoring instruments such self-reported logs, session checklists, or physiological engagement indicators (e.g., heart rate variability or EEG).

Additionally, randomization was not implemented in this study due to practical constraints, including fixed team training schedules and logistical limitations. This may have introduced selection bias or the influence of uncontrolled confounding variables. Future research should prioritize randomized allocation of participants to mindfulness and control conditions to improve internal validity.

Training methods should be expanded to include cognitive and emotional components. A more comprehensive training strategy should be adopted by coaches and sports institutions (Li & Li, 2022). In this strategy, the balance of physical and mental readiness will be an important element in the coaching of athletes (Webster & Ph, 2022). In the long run, neglecting mental aspects may hinder athletes' growth and even increase the risk of injury due to psychological unpreparedness and fatigue (Schampheleer & Roelands, 2024). Mindfulness is a solution that is scientifically evidence-based and simple enough to implement without disrupting basic training routines (Fan et al., 2023; Wang et al., 2023). Athletes' engagement in the program also shows that non-conventional training methods that focus on developing mindfulness and self-control are well received (Su et al., 2024). This may provide a strong basis to encourage mental training to be more systematically incorporated into performance sports coaching programs. Coaches and sports institutions should realize the importance of creating standardized psychological training programs, including self-awareness training, which is an important component in the development of adolescent athletes (Reinhold, 2022). The effect size was very big (Cohen's $d = 3.92$), although caution should be used when interpreting this outcome. Possible explanations for the exaggerated effect include the participants' motivation or expectations, the novelty of the intervention, and the lack of a control group. To reduce any biases and evaluate the sustainability of the mindfulness effect, future research should think about using blinding techniques, objective performance measurements, and long-term follow-up evaluations.

The theoretical perspective of this study is to increase our understanding of how mindfulness is effective in martial arts sports, especially wushu, where not much research has

been conducted. While sports such as wushu are highly dynamic and require a more adaptive approach to mental training, most previous studies have concentrated on highly structured sports such as archery or golf. Moreover, this study adds to the sport psychology literature by providing empirical evidence that self-awareness can be beneficial for sports that involve complex physical and mental loads. The results of this study are consistent with cognitive psychology theories. They suggest that athletes' self-regulation systems can be strengthened with mindfulness training. Increased focus not only improves performance in the short term, but also helps build more conscious habits of mind, which impacts long-term outcomes. The results suggest that mindfulness training should be incorporated into athlete coaching programs rather than a mere supplement; it is a planned effort to produce a generation of physically strong, emotionally stable, and mentally resilient athletes.

Conclusions

This study showed that a mindfulness program helped adolescent wushu athletes become more focused. The four-week intervention successfully improved the athletes' ability to regulate their attention. This suggests that mindfulness training is not only beneficial, but also highly beneficial in a sport that demands high concentration such as wushu. These results confirm the importance of psychological approaches in athlete training and allow coaches to add mindfulness to their overall performance development strategy. Mindfulness can help athletes stay present in every movement, reduce cognitive distractions, and remain emotionally stable when facing the pressure of competition. It is hoped that the findings of this study will provide a basis for coaches, sport psychologists, and athlete development agencies to consider mindfulness as an important component of evidence-based and sustainable mental training. Therefore, this study suggests that incorporating this practice into regular training programs may also improve athletes' mental preparedness in the long run. The incorporation of mindfulness practices into wushu training methods is generally supported by this study. These findings should be viewed with caution, though, because there was no control group. The causal effect of mindfulness on athletic attention has to be confirmed by future research using more exacting approaches

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