



**INTEGRATING MIND, BODY, AND RESILIENCE UNDERSTANDING
MEDIATING FUNCTION OF BODY AWARENESS IN ADOLESCENT ATHLETES'
MENTAL TOUGHNESS**

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ABSTRAK

Perkembangan atlet remaja saat ini masih cenderung berfokus pada aspek teknis dan performa, sementara dimensi psikologis dan somatik seperti kesadaran tubuh belum mendapat perhatian optimal. Penelitian ini bertujuan untuk menganalisis peran mediasi kesadaran tubuh dalam hubungan antara sense of mastery dan mental toughness pada atlet remaja. Penelitian menggunakan pendekatan kuantitatif dengan metode survei terhadap 113 atlet remaja dari berbagai cabang olahraga di salah satu sekolah khusus olahraga di Indonesia. Pengumpulan data dilakukan menggunakan instrumen kuesioner, kemudian dianalisis dengan analisis regresi mediasi (MRA) untuk menguji pengaruh langsung dan tidak langsung antar variabel. Hasil penelitian menunjukkan bahwa sense of mastery berpengaruh positif terhadap mental toughness, serta kesadaran tubuh berfungsi sebagai mediator signifikan dalam hubungan tersebut. Temuan ini mengindikasikan bahwa peningkatan sense of mastery berkaitan dengan meningkatnya kesadaran tubuh, yang selanjutnya berkontribusi pada penguatan mental toughness. Dengan demikian, penelitian ini menunjukkan bahwa integrasi latihan kesadaran tubuh dalam program pembinaan atlet remaja berpotensi meningkatkan ketangguhan mental secara lebih komprehensif.

Kata Kunci: *Sense of Mastery, Kesadaran Tubuh, Mental Toughness, Atlet Remaja, Mediasi*

ABSTRACT

The development of adolescent athletes has predominantly focused on technical skills and performance, while psychological and somatic dimensions such as body awareness have received limited attention. This study aims to examine the mediating role of body awareness in the relationship between sense of mastery and mental toughness among adolescent athletes. A quantitative approach with a survey method was employed, involving 113 adolescent athletes from various sports at a specialized sports school in Indonesia. Data were collected using questionnaires and analyzed using mediation regression analysis (MRA) to examine both direct and indirect effects among variables. The findings indicate that sense of mastery has a positive effect on mental toughness, and body awareness functions as a significant mediator in this relationship. These results suggest that higher levels of sense of mastery are associated with increased body awareness, which in turn contributes to enhanced mental toughness. Therefore, the study highlights that integrating body awareness training into adolescent athlete development programs has the potential to improve mental toughness in a more comprehensive manner.

Keywords: *Sense of Mastery, Body Awareness, Mental Toughness, Adolescent Athletes, Mediation*



INTRODUCTION

The development of adolescent athletes as future professional performers requires structured and sustainable training from an early stage. The Long-Term Athlete Development (LTAD) model emphasizes that athlete development should not only focus on technical skills but also on strengthening psychological capacities to cope with competitive pressure and performance demands (Söker et al., 2025). Mental toughness plays a crucial role in maintaining consistency and resilience in competitive situations (Workman & Stamatis, 2025) and is closely associated with emotional regulation, focus, and long-term motivation (Tahtinen et al., 2026).

Mental toughness is not a standalone construct but is shaped by internal factors such as sense of mastery and body awareness. Sense of mastery reflects an individual's belief in their ability to overcome challenges and achieve goals (Assari et al., 2025). Body awareness refers to the capacity to perceive and interpret bodily sensations and physiological states (Virtanen et al., 2022). The integration of cognitive control and bodily perception provides a stronger foundation for developing mental toughness. This perspective emphasizes that psychological strength is not only cognitive but also embodied in physical awareness. Therefore, athlete development should move beyond isolated skill training toward a more integrated and holistic mind–body approach.

Cross-cultural studies indicate differences in how these aspects are emphasized in athlete development. Athletes in European contexts tend to demonstrate higher levels of body awareness, which are associated with better psychological well-being and resilience (Virtanen et al., 2022). In contrast, athletes in many Asian contexts often prioritize performance outcomes over foundational mental and physiological development (Guo et al., 2023). Furthermore, sense of mastery has been shown to enhance mental toughness and athletic performance (Ibrahim & Ulaiwi, 2024; Soundara Pandian et al., 2023). However, prior research has largely examined these variables independently, leaving their integrative mechanism insufficiently explored.

In Indonesia, the integration of psychological factors into athlete development remains limited. Awareness of the role of mental aspects in supporting performance is still relatively low (Rahayuni, 2022). Training programs for young athletes tend to emphasize technical and physical components, with less attention to psychosocial and bodily regulation aspects (Ismiyati et al., 2024; Safitri et al., 2023). This imbalance contributes to emotional fatigue, reduced concentration, and inconsistent performance under pressure (Chen et al., 2021). These conditions highlight a critical gap between current training practices and the need for holistic athlete development. A more balanced training model that integrates mental and bodily awareness is therefore essential.

Despite growing interest in mind–body integration, limited studies have examined body awareness as a mediating mechanism linking sense of mastery and mental toughness, particularly among adolescent athletes in developing contexts such as Indonesia. Previous studies have mainly focused on direct relationships without exploring indirect pathways (Vealey, 2024; Ramadan et al., 2024). This study offers a focused contribution by empirically testing body awareness as a mediator between sense of mastery and mental toughness in Indonesian adolescent athletes. The study aims to analyze the mediating role of body awareness in the relationship between sense of mastery and mental toughness. Theoretically, it advances sport psychology by integrating cognitive and embodied perspectives, while practically it provides direction for more effective and holistic youth training programs.

RESEARCH METHODS

This study employed a quantitative non-experimental design with a cross-sectional approach to examine the relationship between sense of mastery, body awareness, and mental toughness among adolescent athletes. The analysis focused on testing the mediating role of body awareness using mediation regression analysis (MRA). The participants consisted of 113 adolescent athletes aged 16–18 years from a specialized sports school in East Java, Indonesia, selected from a population of 230 students using purposive sampling. The inclusion criteria were: (1) actively participating as an athlete, (2) having at least city-level competition experience, and (3) willingness to participate in the study. Participants represented various sports, including volleyball, karate, pencak silat, and swimming. This design was selected to allow efficient examination of direct and indirect relationships among variables within a single measurement period.

Data were collected using three standardized instruments: MAIA Version 2 for body awareness, the Pearlin Mastery Scale for sense of mastery, and the Indonesian Mental Toughness Questionnaire for mental toughness. All instruments have demonstrated acceptable validity and reliability in prior studies, with Cronbach's alpha values generally above 0.70. Each instrument was administered in its validated Indonesian version, focusing on core indicators for concise measurement. Data collection was conducted through structured questionnaires administered under researcher supervision to ensure consistency and accuracy of responses. Data analysis was performed using JASP software in two stages, including descriptive statistics with reliability testing and mediation regression analysis (MRA) to assess direct and indirect effects. Statistical significance was set at $\alpha = 0.05$, with emphasis on the indirect effect to confirm the mediating role of body awareness.

RESULT AND DISCUSSION

Result

Table 1 presents the correlation results among sense of mastery, body awareness, and mental toughness. The table summarizes the relationships among the main variables in the study. It provides an overview of how the variables are associated. The results serve as a basis for further analysis.

Table 1. Correlation Test Results

Variabel	Variabel	r	p
Sense of Mastery	Body Awareness	0.663	< .001
Body Awareness	Mental Toughness	0.647	< .001
Sense of Mastery	Mental Toughness	0.476	< .001

The findings in Table 1 indicate that all variables are positively and significantly associated. This pattern reflects a consistent relationship among cognitive and bodily dimensions. It suggests that these variables are interconnected in shaping athletes' psychological strength. These results support further examination using a mediation model.

Mediation Analysis

Table 2 presents the direct effect of sense of mastery on mental toughness. The table summarizes the relationship between the independent and dependent variables. It provides an overview of the direct pathway in the model. The results are used to assess the independent contribution of sense of mastery.

Table 2. Direct Effect of Sense of Mastery on Mental Toughness

Variable	Estimate	Std. Error	z-value	p	95% CI	
					Lower	Upper
Sense of Mastery → Mental Toughness	0.055	0.062	0.888	.375	-0.067	0.177

The results in Table 2 indicate that the direct relationship is not statistically significant. This suggests that sense of mastery alone does not directly predict mental toughness. The finding implies the presence of an intermediary mechanism. Therefore, further analysis is needed to understand the relationship.

Table 3 presents the indirect effect of sense of mastery on mental toughness through body awareness. The table summarizes the mediation pathway in the model. It provides an overview of the indirect relationship among variables. The results help explain the underlying mechanism.

Table 3. Indirect Effect of Sense of Mastery on Mental Toughness

Variable Path	Estimate	Std. Error	z-value	p	95% CI	
					Lower	Upper
Sense of Mastery → Body Awareness → Mental Toughness	0.255	0.049	5.168	< .001	0.158	0.351

The findings show in Table 3 that the mediation pathway is statistically significant. This indicates that body awareness plays an important intermediary role. It suggests that sense of mastery influences mental toughness through body awareness. The result highlights the importance of indirect relationships.

Table 4 presents the total effect of sense of mastery on mental toughness. The table summarizes the combined influence of direct and indirect effects. It provides an overall view of the relationship in the model. The results show the full contribution of the independent variable.

Table 4. Total Effect of Sense of Mastery on Mental Toughness

Variable	Est.	SE	z	p	95% CI
Sense of Mastery → Mental Toughness	0.310	0.054	5.758	< .001	0.204 – 0.415

The results in Table 4 indicate that the overall relationship is statistically significant. This suggests that sense of mastery remains an important predictor in the model. The finding shows that the relationship becomes meaningful when all pathways are considered. It reinforces the importance of a comprehensive analytical approach.

Table 5 summarizes the path analysis of the relationships among the study variables. The table presents the direction of relationships within the model. It provides an overview of the structural pathways. The results help clarify the role of each variable.

Table 5. Path Analysis Results

Path Relationship	Est.	SE	z	p	95% CI
Body Awareness → Mental Toughness	0.421	0.068	6.182	< .001	0.288 – 0.555
Sense of Mastery → Mental Toughness	0.055	0.062	0.888	.375	-0.067 – 0.177
Sense of Mastery → Body Awareness	0.605	0.064	9.414	< .001	0.479 – 0.730

The findings show in Table 5 that sense of mastery significantly influences body awareness. Body awareness, in turn, enhances mental toughness. The direct pathway becomes non-significant when the mediator is included. This confirms the central role of body awareness in the model.

Discussion

The findings confirm that body awareness functions as a key mediating mechanism linking sense of mastery to mental toughness among adolescent athletes. Rather than operating independently, cognitive beliefs about competence require embodiment through bodily perception to become functionally effective. This indicates that resilience is not solely a cognitive outcome but emerges from the interaction between mental control and physical awareness. Thus, mental toughness can be better understood as an integrative capacity shaped by both cognitive and embodied processes.

From a psychological perspective, this mechanism aligns with interoceptive awareness, which emphasizes sensitivity to internal bodily signals. Athletes who are more attuned to these signals tend to regulate stress and emotional responses more effectively during training and competition (Di Fronso et al., 2022). Mindfulness-based approaches similarly highlight the role of bodily awareness in enhancing emotional regulation and performance stability (Schwartz et al., 2025). Recent evidence further strengthens this view by showing that body–mind axial awareness training significantly enhances mindfulness, positive embodiment, and mental health outcomes, indicating that bodily awareness actively facilitates psychological regulation processes (Tien et al., 2026). Taken together, these perspectives suggest that body awareness serves as a bridge between physiological processes and psychological regulation, rather than functioning as a purely physical construct.

Empirical studies consistently show that higher body awareness is associated with improved psychological well-being and reduced anxiety (Gürkan et al., 2023; Tokola, 2021). Athletes who can recognize early signs of fatigue and stress are more capable of adjusting their effort and maintaining focus under pressure. This is supported by findings that interoceptive sensitivity and body perception are closely linked to psychological well-being, reinforcing the role of bodily awareness in maintaining emotional balance (Krymow et al., 2025). While these findings align with prior research, the present study extends them by demonstrating how such awareness operates within a mediational framework linking self-belief to resilience. This



highlights that behavioral expressions of mental toughness, such as persistence and emotional control, are supported by the ability to interpret bodily signals.

The absence of a significant direct relationship between sense of mastery and mental toughness further underscores the complexity of resilience development. Previous studies have often reported a direct association between these variables (Stamatis et al., 2023), yet the current findings suggest that this relationship may depend on intermediary processes. This difference indicates that cognitive confidence alone is insufficient unless it is translated into adaptive physiological and experiential responses. Therefore, the role of body awareness becomes essential in explaining how self-belief is transformed into consistent psychological performance.

From an applied perspective, integrating body-awareness-based training into athletic programs can enhance both psychological and physical outcomes. Interventions such as mindfulness training, breathing regulation, and somatic awareness exercises have been shown to improve emotional stability and resilience (Wang et al., 2021; Vancampfort et al., 2023). Compared to conventional training that emphasizes technical repetition, these approaches offer a more adaptive strategy by strengthening athletes' self-regulation capacity. In addition, reflective awareness during training supports athletes in managing competitive stress and recovering from setbacks (Santi et al., 2024), contributing to long-term performance sustainability (Hovland et al., 2023).

This study makes a distinct contribution by demonstrating that body awareness is not merely a complementary factor but a central mechanism that explains how sense of mastery translates into mental toughness. By positioning body awareness as a mediator, the findings provide a more precise explanation of the underlying process connecting cognitive belief and psychological resilience. Importantly, this study advances prior literature by explicitly integrating recent mind body evidence into a mediation framework, thereby clarifying the underlying mechanism through which embodied awareness strengthens resilience. Furthermore, this study advances the literature by integrating cognitive and embodied perspectives into a unified framework of athlete development. These insights offer both theoretical refinement and practical direction for designing more holistic and effective training programs for adolescent athletes.

CONCLUSION

This study concludes that body awareness mediates the relationship between sense of mastery and mental toughness among adolescent athletes. The findings indicate that athletes' beliefs in their competence are not sufficient to directly strengthen mental toughness without the support of bodily awareness. This highlights that resilience develops through the alignment of cognitive confidence and the ability to regulate bodily states. By positioning body awareness as a central mechanism, the study provides a clearer understanding of how self-belief translates into adaptive psychological strength. Practically, these findings emphasize the importance of integrating body-awareness-based training, such as mindfulness movement, breathing regulation, and somatic reflection, to enhance emotional stability and performance consistency.

This study also acknowledges several limitations. The use of a cross-sectional design restricts causal interpretation, and the sample was limited to a specific region and age group, which may affect generalizability. Future research is recommended to apply longitudinal or experimental designs to better examine causal relationships and intervention effects. Further studies across diverse sports, genders, and cultural contexts are needed to strengthen the



generalizability of these findings. Overall, this study underscores that developing mental toughness requires an integrated mind–body approach, positioning body awareness as a critical leverage point for optimizing adolescent athlete performance.

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