



The Effect of Motivational General Arousal Imagery Training on the Mental Toughness of Handball Athletes

Tsurayya Nabillah Zahra¹, Nida'ul Hidayah²✉, Mochamad Yamin Saputra³

Sports Coaching Education Program, Faculty of Sports and Health Education, Indonesia University of Education, Bandung, West Java, Indonesia¹²³

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Abstract

An athlete's performance depends not only on physical ability and technique, but also on mental strength, which is fundamental in coping with the pressures of competition. In team sports such as handball, mental toughness greatly influences individual and team performance. One psychological method that can be used to improve mental readiness is motivational general arousal imagery, which is an imagination exercise that focuses on increasing motivation, controlling emotions, and preparing to face competitive pressure. This study aims to determine the effect of motivational general arousal imagery training on improving the mental toughness of handball athletes. The method used was a quasi-experiment with a one-group pre-test post-test design. The research sample consisted of 14 handball athletes from Bandung. The treatment was given for 12 sessions with a frequency of 3 times per week, each lasting 20-30 minutes. Mental toughness was measured using the Sport Mental Toughness Questionnaire (SMTQ) before and after the treatment. The results showed that Motivational General Arousal Imagery training had a significant effect on increasing the mental toughness of handball athletes. Based on the Wilcoxon test results with a sig. value of $0.001 < 0.05$, there was a significant difference between the pre-test and post-test. The average mental toughness score increased from 27.93 to 46.93 after the treatment, indicating a significant increase in mental toughness. Motivational General Arousal Imagery training proved to be effective in increasing the mental toughness of handball athletes. Coaches and sports practitioners are advised to integrate Motivational General Arousal Imagery training into routine training. This exercise can be done simply, either individually or in groups, to improve athletes' mental toughness.

How to Cite

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✉ Correspondence Author:
E-mail: nidaul@upi.edu

INTRODUCTION

In the world of sports, an athlete's performance is not only determined by physical ability and technique, but also by mental strength (Nisa & Jannah, 2021). Mental strength is the main foundation that helps athletes cope with the pressure of competition and the demand to always perform at their best (Soundara Pandian et al., 2023). Athletes with good mental toughness are able to control their emotions, stay focused, and maintain their fighting spirit even when facing difficult conditions (Hendrizal Aganta, 2024). In team sports such as handball, this ability is very important because individual performance affects the overall success of the team (Nurhadi et al., 2023). Therefore, developing mental toughness is an important part of athlete training programs.

Handball is a sport that requires speed, strength, accuracy, and close teamwork (Bhakti, 2024). In intense matches, athletes must make quick decisions, maintain coordination, and control their emotions so that the team's strategy can be effective (Hughes & Terrell, 2023). The mental pressure is very high, especially when facing stronger opponents. Many examples show that athletes who fail to manage pressure lose focus and make mistakes (Low et al., 2023). This confirms that psychological aspects are as important as physical aspects in determining the success of handball athletes (Candra et al., 2025).

One psychological method that can be used to improve an athlete's mental readiness is imagery training (Wu et al., 2023). This exercise helps create mental images of sporting experiences by engaging the senses such as sight, hearing, and feeling (Festiawan, 2020). Of the various types of imagery, motivational general arousal imagery emphasizes increasing motivation, controlling emotions, and preparing to face competitive pressure (Spindler et al., 2019). In this exercise, athletes imagine the competition situation positively, strengthen their self-confidence, and prepare themselves to face challenges (Eko Nopiyanto et al., 2022). With regular practice, this technique is believed to strengthen psychological aspects, especially the mental toughness of athletes (Ariana, 2019).

Mental toughness is an individual's ability to possess characteristics such as optimism, positive affectivity, and self-confidence to bounce back from stressful experiences such as competitive sports (Sheard et al., 2023). Mental toughness itself is a person's ability to remain consistent, focused, and committed to their goals despite facing pressure or difficulties (Maulana et

al., 2025). Athletes with strong mental toughness are able to cope with stress, bounce back from failure, and remain motivated to achieve (Soundara Pandian et al., 2023). In handball, mental toughness is a distinguishing factor between athletes who can perform at their best and those who are easily affected by the situation of the match (Hussain et al., 2024).

Based on this, the researchers aimed to determine whether motivational general arousal imagery training has an effect on improving the mental toughness of handball athletes. The results of this study are expected to serve as a reference for coaches and sports practitioners in designing effective psychological training programs to support overall athlete performance. The novelty of this research lies in examining the effectiveness of Motivational General Arousal Imagery specifically on the mental toughness of handball athletes, an area that has received limited empirical attention.

METHOD

This method uses a quasi-experimental design with a one-group pre-test-post-test design (Salfina & Aulia, 2021). This design was chosen because it allows researchers to observe changes in one group of subjects before and after treatment, even without a control group. Through this design, initial measurements were taken to describe the athletes' mental toughness levels before treatment. After that, the athletes received a mental training program in the form of Motivational General Arousal Imagery, which was systematically compiled (Spindler et al., 2019). A post-test was then conducted to see if there were significant changes after they had completed the entire program.

The subjects of this study were 14 male handball athletes selected based on specific criteria that had been determined beforehand. The inclusion criteria included being between 18 and 22 years of age and having at least two years of experience playing or competing in handball. Thus, the data obtained was expected to provide an accurate picture of the effect of motivational general arousal imagery training on mental toughness in the context of handball.

The instrument used in this study was the Sport Mental Toughness Questionnaire (SMTQ) (Astaficevs et al., 2020). The SMTQ consists of 14 items that measure athletes' mental toughness through three main dimensions, namely confidence, constancy, and control. This instrument is compiled in the form of questions that are then

scored according to the subjects' responses to each question.

Data obtained from the SMTQ questionnaire in the pre-test and post-test stages were then analyzed quantitatively to determine the effectiveness of the treatment. After data collection, analysis was performed using SPSS version 29 software to assess descriptive tests, normality tests, and paired t-tests if the data were normally distributed. If the data were not normally distributed, the Wilcoxon test was performed.

RESULTS AND DISCUSSION

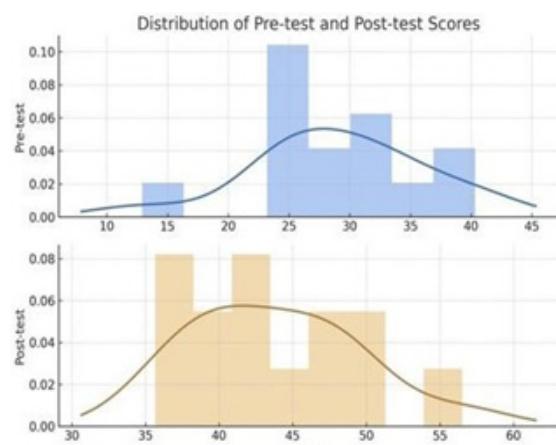
The following is a description of data and analysis regarding the mental toughness of handball athletes, reviewed from the results before and after being given Motivational General Arousal Imagery training. The analysis was conducted on a group of athletes who participated in a training program for twelve sessions with a frequency of three times a week. This study aims to determine the extent to which motivational imagery training can improve the mental toughness of athletes after being given systematic treatment.

Table 1. Statistical description

Variable	Mean	N	Std. Deviation	Std. Error Mean	Description
Pre-test	27.93	14	7.849	2.098	Initial scores before the treatment, showing lower mental toughness levels
Post-test	46.93	14	6.534	1.746	Scores after the treatment, indicating an improvement in participants mental toughness

Table 1 shows that the pre-test average score of 27.93 increased to 46.93 in the post-test of 14 respondents. The pre-test standard deviation of 7.849 is greater than the post-test standard deviation of 6.534, which means that the participants' scores became more uniform after the treatment. In addition, the decrease in the standard error mean from 2.098 to 1.746 shows that the post-test results are more stable and accurate. Overall, these data indicate that the treatment given was successful in improving the participants' abilities.

The distribution **Graph 1** shows a comparison of pre-test and post-test scores after the treatment was given. The pre-test distribution was in the lower score range with an average of 27.93, while the post-test distribution shifted towards higher scores with an average of 46.93. This shift in distribution illustrates an increase in respondents' abilities after the treatment was given.



Graph 1. Percentage Pre-test post-test difference

Because the pre-test and post-test data are not normally distributed, the Wilcoxon Signed Rank Test was used to see whether there was an effect of the treatment.

Table 2. Wilcoxon Test

Statistics	Value	Description
Z	-3.238	Indicates a significant difference between pre-test and post-test scores after the treatment
Asymp. Sig. (2-tailed)	0.001	The p-value is below 0.05, meaning the treatment had a statistically significant effect on participants scores.

Based on the **Table 2.** Wilcoxon test results, a significance value of $0.001 < 0.05$ was obtained, which means that H_0 is rejected and H_1 is accepted. Thus, it can be concluded that the application of Motivational General Arousal Imagery training has a significant effect on improving the mental toughness of handball athletes.

Motivational General Arousal Imagery training has been proven effective in improving the mental toughness of handball athletes, as demonstrated by the researchers. These findings indicate that imagination-based training designed to motivate and manage emotions can strengthen athletes' psychological readiness to face the pressure of competition (Hamid et al., 2025). The increase in the average pre-test to post-test scores illustrates a significant change in the athletes' mental readiness. The Wilcoxon test results with a significance value below 0.05 further reinforce this effectiveness. Therefore, coaches and sports psychologists can incorporate this exercise into routine training programs to build stable mental resilience.

Motivational General Arousal Imagery training helps athletes develop self-confidence through positive visualization of competition situations (Heydari & Soltani, 2018). In the process, athletes not only develop technical success but also instill adaptive emotional responses to pressure or failure (Sholichah, 2025). This aligns with sports psychology theory, which states that mental imagery can trigger physiological and psychological reactions similar to real-life experiences (Przybylska et al., 2023). By getting used to facing pressure through imagination, athletes become better prepared when facing real situations (Toivanen, 2019). Therefore, the ability to engage in directed imagination is an important skill in managing competition stress.

Additionally, the results of this study show that mental toughness plays a significant role in improving athlete performance, even though physical training and technique remain fundamental. The ability to control emotions, maintain focus, and remain optimistic when facing difficulties is what distinguishes elite athletes from average ones (Hendrizal Aganta, 2024). Mental toughness is developed through consistent psychological training, not instantly (Utami et al., 2024). Therefore, integrating physical and mental training must be a focus in development programs, especially in team sports like handball. Imagery training provides athletes with the opportunity to validate mental aspects independently (Volgemutte, 2025).

This study also shows that the use of the Sport Mental Toughness Questionnaire (SMTQ) is an effective tool for monitoring changes in the mental condition of athletes (Astaficevs et al., 2020).

Through the aspects of self-confidence, consistency, and self-control, the study observed significant development in all dimensions after treatment, confirming that imagery training has a comprehensive impact on various psychological aspects of athletes (Liu et al., 2025). Valid statistical analysis shows that these changes are the result of structured mental training, reinforcing the importance of a scientific approach in athletes' psychological training (Jori, 2025).

In terms of application, Motivational General Arousal Imagery training is relatively easy to perform without requiring special equipment or significant costs. The training can be applied individually or in groups according to the athlete's needs. The coach only needs to provide a narrative guide of a positive competition situation, then ask the athlete to visualize the desired feelings, actions, and results. With regular practice, athletes can better manage anxiety and build

confidence before competing (Yahya et al., 2025). This is a practical solution for strengthening psychological aspects without disrupting physical training schedules.

Overall, this study confirms that sports psychology plays an important role in supporting the performance of handball athletes. Improving mental toughness through imagery training has been proven to help athletes cope with pressure, maintain focus, and stay motivated (Soundara Pandian et al., 2023).

In the future, similar studies can be conducted with larger samples or experimental methods with controls so that the results are more scientifically robust. Exploring variations in the duration and intensity of imagery training could also be done to determine the most effective method. With a consistent scientific approach, mental training can become an integral part of the modern athlete development system in Indonesia. Beyond the measured variables, athletes showed improved confidence and team communication, suggesting future research could examine how individual differences and team dynamics influence the effectiveness of imagery training.

CONCLUSION

Based on the research results, it can be concluded that Motivational General Arousal Imagery training has a notable effect on improving the mental toughness of handball athletes. This imagination-based training can increase athletes' confidence, emotional control, and consistency in facing competitive pressure. The results of the statistical test showed a notable difference between the pre-test and post-test, indicating the effectiveness of this method in strengthening the psychological aspects of athletes.

This training is easy to implement, does not require special equipment, and can be done individually or in groups. Therefore, coaches are advised to integrate it into their routine training programs to develop athletes' mental preparedness. Overall, Motivational General Arousal Imagery has proven to be an effective strategy for developing resilient, focused, and high-performing athletes.

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