The Effect of Imagery Intervention on Imagery Ability and Competitive Anxiety of Badminton and Fencing Athletes

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ABSTRACT

The use of imagery as an intervention in sports psychology to optimize athletic performance is well-established. This research aims to investigate the impact of imagery intervention on both imagery ability and competitive anxiety within the demographic of badminton athletes and fencers. The study comprised a sample size of 30 athletes, with 15 participants in each group of badminton and fencing athletes aged between 15 to 25 years. The participants encompassed individuals competing at state, national, and international levels across various events within their respective sports. Employing a quantitative approach, the study used pre and post-test assessments to gather data, and the Sports Imagery Ability Questionnaire (SIAQ) and Sport Competition Anxiety Test (SCAT) were administered to all participants. A four-week imagery training program was delivered to all participants. Statistical analyses, including paired sample t-tests and independent sample t-tests, were conducted to evaluate the outcomes. Findings indicate a significant influence of imagery intervention on both imagery ability and competitive anxiety of badminton and fencing athletes.

Keywords: Imagery training, Imagery ability, Competitive Anxiety, Sports psychology, Badminton, Fencing athletes.

INTRODUCTION

Sports psychology is an interesting field that is continuously growing every day. It studies how psychological or mental factors affect the well-being and performance of an athlete. Badminton athletes and Fencers, both badminton and Fencing sports, are popular in India. Sports psychology enhances their mental aspect in various competitions and helps athletes cope with their competitive anxiety during competition and before the competitions. Both badminton and Fencing sports require athletes to maintain a high level of Focus and concentration during the competition. Sports psychologists can teach badminton athletes and Fencers a range of mental skills and techniques to enhance their performance. It can also teach many techniques to reduce the negative attributes that affect their performance. These may include visualization, self-talk, relaxation techniques, imagery etc. Athletes can improve their focus, confidence, resilience, and overall mental preparation by developing these skills.

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Imagery

"The application of imagery in coping with performance-related stress and anxiety has increased in importance (Vealey & Walter, 1993)". All of the body's senses may be incorporated into this approach. Although the visual domain is emphasized in most sports contexts, incorporating as many other senses as possible into the imagery experience optimized its stress-management potential. Mental imagery techniques can be highly effective in reducing competitive anxiety among badminton athletes and fencers. Study has indicated that mental imagery process of the mental imagery training group was significantly higher than without mental imagery training, and all experimental groups have a significantly learning achievement higher than control group (Hidayat, Y. (2011).

Competitive Anxiety

Athletes often experience competitive anxiety and pressure during competitions. Anxiety is a negative emotional state characterized by nervousness, worry, and apprehension associated with activation or arousal of the body (Weinberg, 2023). Competitive anxiety is a temporary, ever-changing emotional state of subjective, consciously perceived feelings of apprehension and tension associated with the activation of the autonomic nervous system. It can lead to physical symptoms such as increased heart rate, sweating, trembling, shallow breathing, and muscle tension. It can also struggle with cognitive symptoms such as racing thoughts, over thinking, negative self-talk, difficulty concentrating, self-doubt, and fear of failure (Ford et al. 2017). Sport psychologists can help athletes develop strategies to manage these feelings, regulate their emotions, and perform at their best under pressure. Techniques such as breathing exercises, positive self-talk and mental imagery can be beneficial in this regard.

a. Cognitive State Anxiety

Cognitive state anxiety refers to the psychological or subjective experience of anxiety. It involves worry, apprehension, fear, and negative thoughts related to potential future events or outcomes (Weinberg, 2023).

b. Somatic State Anxiety

Somatic state anxiety refers to the physiological symptoms of anxiety experienced by athletes before and during the competitions. It involves as increased heart rate, sweating, trembling, shallow breathing, and muscle tension (Weinberg, 2023).

The elite soccer players' perceptions—that is, their exploratory behavior and prospective control over future actions—would be impacted by an imagery intervention program. The visuals were modified to reflect the unusual action opportunities that usually each player's individual gaming experience (Jordet, 2005). In more recent times, researchers have employed multiple-baseline case studies—that is, studies with a small number of participants over an extended period of time, with several assessments recording behavioral and performance changes—and have found positive effects of imagery on performance enhancement and other psycho-

logical variables such as confidence and coping with anxiety (Evans et al., 2004).

Donie (2017) studied how guided imagery could reduce anxiety among athletes. Employing a quantitative methodology, he utilized a pretest-posttest design involving control and experimental groups. The study initiated with data collection utilizing tools such as the Sports Anxiety Scale (SKO), followed by intervention and posttest assessments. Subsequently, the collected data underwent analysis through the Mann-Whitney test, revealing a noteworthy distinction in anxiety levels between the two participant groups. Hall (1990) revealed how imagery exercises help the athlete to achieve optimal level of arousal by experimenting with different levels of physiological activation. Vadocz (1997) studied how competitive anxiety correlates with the use of imagery. Employing a quantitative approach, the researcher surveyed 57 athletes, requesting them to complete the Movement Imagery Questionnaire (MIQ), Sports Imagery Questionnaire (SIQ), and Competitive State Anxiety Inventory-2 (CSAI-2) 90 minutes before their respective games. The findings indicated that employing imagery may aid in managing levels of competitive anxiety.

Imagery is one of the greatest tools used in sports psychology to enhance performance. Studies have found that practicing imagery along with regular training enhances muscle memory and sports skills faster and further than regular training alone. Thus, the study aims to investigate the impact of imagery intervention on both imagery ability and competitive anxiety within the demographic of badminton athletes and fencers.

METHODOLOGY

Study design

In our present investigation, we utilized a pre-test and post-test research design to evaluate the impact of an intervention on a non-randomized group of participants. This design involves measuring the variable of interest on two occasions: before the intervention (pre-test) and after the intervention (post-test). The current study comprised three phases: a pre-test, an intervention, and a post-test. Initially, all participants underwent a pre-test assessment using two standardized tools. Subsequently, in the study's second phase, participants engaged in a 4 weeks imagery intervention technique. Finally, in the third and concluding stage, all participants underwent a post-test evaluation using the same assessment tools.

Sample selection

The research involved 30 participants, comprising 15 Badminton athletes (male: 11, and female: 4) participating in both Singles and Doubles events, and 15 Fencers (male: 10, and female: 5) competing in Sabre, Epee, and Foil events at State, National, and international levels with age ranges from 15 to 25 years. The study solely consisted of an experimental group; there was no utilization of a control group in the research design. Informed consent was taken from each athlete for this study.

Tools

1. **Sport Imagery Ability Questionnaire (SIAQ)**

   The SIAQ scale developed by

Williams and Cumming (2011) is quick and easy to use. It consists of 15 statements ratings on a 7-point type Likert scale ranging from 1 (Very hard to image) to 7 (Very easy to image). As such, it is highly suited for applied work. It may assist the practitioner evaluate an athlete's present level of ability in terms of their imaging proficiency. Athletes can also use the SIAQ as a tool for self-evaluation. An athlete can better understand the topics they may find simpler or more difficult to imagine by completing the SIAQ, enabling them to reflect on their imagery capacity. The simple nature of the questionnaire makes it ideal for recording improvements in imagery skills developed by training activities or imagery practice. The SIAQ shows good internal consistency (reliability coefficients between 0.74 and 0.86) and strong factorial validity supported by confirmatory factor analysis.

2. Sport Competition Anxiety Test (SCAT)

The Sports Competition Anxiety Test (Martens 1977), commonly known simply as the SCAT, is a self-report anxiety questionnaire. It consists of 15 statements, and the participants answer each statement with three choices: Rarely, Sometimes, and Often, according to their feelings. The SCAT analyzes an athlete's responses to a series of statements about how they feel in a competitive situation. The test is good for monitoring the performance anxiety of an athlete by conducting the rest at regular intervals and noting the changes over time. The SCAT has demonstrated high reliability (test-retest reliability coefficient = 0.83; split-half reliability = 0.94) and acceptable validity for use with athletic populations." There is no time limit.

Procedure

This study used a quantitative approach to evaluate the effects of imagery on competitive anxiety and imagery ability in fencers and badminton athletes. This approach was chosen by the researcher's interest in understanding how imagery affects these variables. The study consisted of three phases: an initial pretest involving psychological assessment tools administered to two groups–fencers and badminton athletes, followed by a four-week intervention period where imagery technique was implemented with both groups and, finally, a post-test utilizing the same psychological assessment tools. Statistical analysis was conducted on the gathered data to examine the outcomes.

Statistical Analysis

The data analysis in this study was conducted in accordance with its objectives. Excel and SPSS software version 20 were utilized to assess the effect of a 4-week imagery intervention on the imagery ability and competitive anxiety of fencers and badminton athletes. The sample was first categorized based on demographic factors such as gender, age, level, and events through frequency distribution analysis. Descriptive statistics, including mean and standard deviation, were employed to characterize the data. Inferential statistics, such as Paired sample t-tests and Independent sample t-tests, were utilized to test significance at 95% of confidence interval (CI).

RESULTS

Table 1 displays badminton athletes' pre and post-test means and standard deviation (SD) across 2 variables. In the pretest, the mean and SD of the imagery ability variable are 3.36 and .69, and in the competitive anxiety variable, they are 20.6 and 3.24, respectively. In the post-test, the mean and SD of the imagery ability variable are 5.88 and .39, and in the competitive anxiety variable, they are 12.2 and 1.61, respectively. Similarly,

Table 1. Display Pre-post means and Standard deviation of the athletes.

Sport	Test	Variables	Mean	SD
Badminton (N=15)	Pre-test	Imagery Ability	3.36	.69
		Competitive Anxiety	20.6	3.24
	Post-test	Imagery Ability	5.88	.39
		Competitive Anxiety	12.2	1.61
Fencing (N=15)	Pre-test	Imagery Ability	3.45	.67
		Competitive Anxiety	21.53	2.66
	Post-test	Imagery Ability	5.85	.62
		Competitive Anxiety	13.33	1.87

SD: standard deviation

Table 1 also presents the pre- and post-test means and standard deviations (SD) of fencing athletes across the same two variables. In the pretest, the mean and SD of the imagery ability variable are 3.45 and .67, and in the competitive anxiety variable, they are21.53 and 2.66, respectively. In the posttest, the mean and SD of the imagery ability variable are 5.85 and .62, and in the competitive anxiety variable, they are 13.33 and 1.87, respectively.

Table 2 shows the mean value, standard deviation (SD), t value, df value, and Sig.(2-tailed) of paired t-tests of badminton athletes in two variables: Imagery ability and Competitive anxiety. For Imagery ability, the t-value is -12.79, and the 2-tailed significance (Sig.) value is <.001 (p= 4.107), indicating a significant difference between the pretest and posttest measurement of badminton athletes in imagery ability. In Competitive anxiety, the t-value is 8.252, and the 2-tailed significance (Sig.) value is <.001 (p= 9.526), indicating a significant

Table 2. Paired sample t-test of Badminton and fencing athletes in two variables using pre-post test scores

Sport	Variables	Mean difference	SD	t-value	Sig. (2-tailed)
Badminton	Imagery Ability	-2.516	-2.516	-2.516	-2.516
	Competitive Anxiety	8.400	8.400	8.400	8.400
Fencing	Imagery Ability	-2.400	-2.400	-2.400	-2.400
	Competitive Anxiety	8.200	8.200	8.200	8.200

*****significance at 0.001, SD: Standard deviation, df=14**

difference between the pre-test and post-test measurement of badminton athletes in competitive anxiety. Additionally, the mean value, standard deviation (SD), t-value, df value, and Sig.(2-tailed) of paired t-tests of fencing athletes in two variables: imagery ability and competitive anxiety. For Imagery ability, the t-value is -11.10, and the 2-tailed significance (Sig.) value is <.001 (p= 2.509), indicating a significant difference between the pre-test and post-test measurement of fencers in imagery ability. In Competitive anxiety, the t-value is 12.93, and the 2-tailed significance (Sig.) value is <.001 (p=3.551), indicating a significant difference between the pre-test and post-test measurement of fencers in competitive anxiety.

Table 3 shows the mean value, standard deviation (SD), mean difference, df value, and Sig.(2-tailed) of Fencers and badminton athletes in Imagery ability variable. The mean difference between fencers and badminton athletes is -.029, and sig. (2-tailed) value is 0.88, which exceeds the threshold of 0.05 (>0.05), indicating there is no difference in the imagery ability of fencers and badminton athletes' post-intervention. Additionally, the mean value, standard deviation (SD), mean difference, df value, and Sig.(2-tailed) of Fencers and badminton athletes in Competitive anxiety variable. The fencers and badminton athletes' mean difference are 1.133 and sig. (2-tailed) value is 0.87, which exceeds the threshold of 0.05 (>0.05), indicating there is no difference in the competitive anxiety of fencers and badminton athlete's post-intervention.

Table 3. Independent t-test score of Imagery ability and Competitive anxiety of fencing and badminton athletes using post-test scores.

Variables	Sport	Mean	SD	Mean difference	Sig. (2-tailed)
Imagery ability	Fencing	5.85	.62	- .029	.88 NS
	Badminton	5.88	.39		
Competitive anxiety	Fencing	13.33	1.87	1.133	.087 NS
	Badminton	12.20	1.61		

NS: non- significant, df = 28

DISCUSSION

The present study was conducted to know the effect of imagery training on imagery ability and competitive anxiety among badminton athletes and fencers. The study hypothesized that imagery training would significantly affect imagery ability and competitive anxiety among athletes. The pre and post-test method was utilized on 15 athletes each in badminton and Fencers. Imagery intervention was conducted for 4 weeks on the participants, and then a post-test was conducted; later, the results were analyzed. Based on the results, it could be concluded that imagery training has a significant effect on imagery ability and competitive anxiety.

Observing Table 2, which present paired sample t-test results for both

variables, it is evident that in the variables, imagery ability and competitive anxiety among badminton athletes and fencers, the Sig. (2-tailed) value is <.001 in each, indicating a significant difference between pretest and posttest scores for both groups. This shows that imagery intervention has a significant effect on both variables.

Observing table 3, which present independent sample t-test results for both variables, it is evident that in the variables, imagery ability and competitive anxiety among badminton athletes and fences, the Sig. (2-tailed) value is .88 in imagery ability and .087 in competitive anxiety, indicating there is non-significant difference between badminton athletes and fencers in the post-test scores. This indicates that both groups of athletes experience a significant impact from imagery intervention, effectively improving their imagery ability and equally reducing their competitive anxiety levels.

Based on the previous studies done on the relationship between imagery and competitive anxiety, it was concluded that there is a significant effect of imagery on competitive anxiety and imagery ability. Donie (2017) proved in his study that there was a significant effect of imagery on the anxiety level of athletes. Vadoa (1997) also proved that there is a positive effect of imagery in controlling competitive anxiety. These previous studies provided ample evidence and support to the present study, proving that there is a significant effect of imagery intervention on competitive anxiety and imagery ability in athletes.

CONCLUSION

The study indicates that imagery training affects competitive anxiety and imagery ability in badminton and fencing athletes. However, there was no significant difference between the post-test scores of badminton athletes and fencers in both variables, which shows that both groups of athletes have an equally significant effect of imagery intervention. The findings of the study can be used to promote the use of imagery intervention among athletes to enhance their performance and well-being across all sports.

REFERENCE

Afremow, J., Overby, L., & Vadocz, E. (1997). Using mental imagery to enhance sport and dance skills of children. Journal of the International Council for Health, Physical Education, Recreation, Sport, and Dance, 33(4), 45-48.

Donie, Aulia, P., & Argantos. (2017). The Effectiveness of Training Guided Imagery in Lowering Anxiety on Athletes. Yishpess Proceedings.

Evans, L., Jones, L., & Mullen, R. (2004). An imagery intervention during the competitive season with an elite rugby union player. *The Sport Psychologist,* 18(3), 252-271.

Ford, J. L., Ildefonso, K., Jones, M. L., & Arvinen-Barrow, M. (2017). Sport-related anxiety: current insights. *Open access journal of sports medicine,* 205-212.

Hall, C. R., Rodgers, W. M., & Barr, K. A. (1990). The use of imagery by athletes in selected sports. *The Sport Psychologist,* 4(1), 1-10.

Hidayat, Y. (2011). The effect of goal setting and mental imagery intervention on badminton learning achievement motor skill at 10-12 years old: The context of Indonesia. *Educare,* 3(2).

Jordet, G. (2005). Perceptual training in soccer: An imagery intervention study with elite players. *Journal of applied sport psychology,* 17(2), 140-156.

Martens, R (1997). Sport Competition Anxiety Test. Champaign, IL: Human kinetics.

Martens, R., Vealey, R.S., & Burton, D. (1990). *Competitive Anxiety in Sport.* Champaign, IL: Human kinetics

Vealey, R. S., & Walter, S. M. (1993). Imagery training for performance enhancement and personal development. Applied sport psychology: Personal growth to peak performance, 2, 200-221.

Vadoa, E. A., Hall, C. R., & Moritz, S. E. (1997). The relationship between competitive anxiety and imagery use. *Journal of Applied Sport Psychology,* 9(2), 241-253.

Weinberg, R. S. & D. Gould (2023). *Foundations of sport and exercise psychology,* Human kinetics. Chap. 13, Imagery (pp.293-295).

Williams, S. E. & Cumming, J. (2011). Measuring athlete imagery ability: The Sport Imagery Ability Questionnaire. Journal of Sport & Exercise Psychology, 33, 416-440.

Williams, S. E., & Cumming, J. (2014). The Sport Imagery Ability Questionnaire Manual. Birmingham, UK: Author