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EFFECT OF HIGH INTENSITY INTERVAL TRAINING ON SELECTED PSYCHOLOGICAL FACTORS OF FIELD HOCKEY PLAYERS

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ABSTRACT

This paper discusses the effects of High-Intensity Interval Training (HIIT) on key psychological variables (competitive anxiety, self-confidence, mental toughness in male college-level field hockey players with an age range of 18 to 25 years. A sample of 30 subjects was chosen and divided randomly into an experimental and a control group, the former undergoing a 12-week HIIT program and the latter continuing with their normal activities without any special training. The outcome of the experimental group showed considerable changes in competitive anxiety, $t(14) = 41.24$, $p < .05$, with the mean scores falling to 29.00 ± 1.31 from 34.40 ± 1.12. Self-confidence showed a significant increase, $t(14) = 53.02$, $p < .05$, rising from 27.60 ± 1.12 to 33.87 ± 1.40. Mental toughness also improved significantly, $t(14) = 42.56$, $p < .05$, increasing from 51.60 ± 1.12 to 59.33 ± 1.63. The control group, conversely, did not experience any significant alterations in either psychologica. Overall, the results indicate that HIIT is an effective training method for enhancing competitive performance by improving mental toughness, increasing self-confidence, reducing anxiety.

KEYWORDS: *High-Intensity Interval Training (HIIT), Field Hockey, Competitive Anxiety, Self-Confidence, Mental Toughness.*

INTRODUCTION

Physical education is one of the key pillars in ensuring holistic health, growth, and development among children as it encourages them to engage in regular physical exercises that enhance bone density and reduce the risk of developing chronic conditions like osteoporosis and cardiovascular diseases (World Health Organization, 2020; Pate et al., 2006). Physical education is of great importance because it has a historical background, as ancient civilizations such as Sparta, Athens, and Rome all had a historical background of focusing on physical training as part and parcel of education. This lasting fame underscores an international agreement on the need to have a physically fit nation to guarantee individual health and consequently national growth and stability. In the modern times, with the introduction of mechanization, the need to engage in physical activity in everyday lives has significantly reduced, and this has triggered a reduction in the natural physical activity among the populations (Owen et al., 2010). It has therefore become inevitable to include organized fitness programs to reverse sedentary living and attain the best health results. Setting specific and quantifiable fitness goals at a young age, as well as the regular engagement in scientifically-informed physical activity programs, is a key to maintaining high levels of physical fitness and general health in the course of life.

The game of field hockey can be used as a relevant example of the sport that requires a well-coordinated combination of physical and mental abilities. Being a highly dynamic team game with quick motions, agility, and tactical play, field hockey demands an athlete to have physiological as well as psychological strength to perform (Fuchs et al., 2020; Höner et al., 2015). The sporting nature of the activity requires thorough training that promotes speed, agility, and endurance, and also develops cognitive abilities including concentration and emotional control, which are essential in the high-level performance. A relatively recent training modality is High-Intensity Interval Training (HIIT) that can effectively enhance cardiovascular fitness and muscular performance by including short intense exercise sessions in between the periods of rest (Buchheit and Laursen, 2013; Gibala et al., 2012). Not only does this strategy enhance physical abilities, but also has a beneficial effect on such psychological constructs as self-confidence and mental toughness, which are essential in competing in sports like field hockey. HIIT implementation in athletic training programs is a good approach to improving the physical and mental aspects of the athlete development, and, consequently, performance and competitive preparedness.

METHODOLOGY

Selection of Subjects

This research was intended to investigate the impact of high-intensity interval training on chosen psychological variables of field hockey players. A random sample of 30 male college students of Sri Ramakrishna Mission Vidyalaya Maruthi College of Physical Education, Coimbatore, Tamil Nadu was chosen and separated into two groups; experimental group (n = 15) and control group (n = 15). Experimental group was subjected to a high-intensity interval training program of 12 weeks and the control group was left to follow their usual routine with no training.

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2.2 Selection of Variables

Table-1

S.NO	VARIABLES	TEST/ EQUIPMENTS	UNIT OF MEASURES
Psychological Variables			
1.	Competitive Anxiety	Competitive State Anxiety Inventory-2	Score
2.	Self-Confidence	Sport Confidence Inventory	Score
3.	Mental Toughness	Mental Toughness Questionnaire	Score

Research Design

The purpose of the study was to find out the effect of high intensity interval training on selected psychological factors of field hockey players of 18 to 25 years. For that purpose 30 male hockey players were randomly selected and they were divided into two equal groups namely experimental group (EG), and control group (CG) consisted of 15 subjects each. Random group design was adopted for the study. High intensity interval training were given for twelve weeks for experimental groupand the control group was not given any specific training. Tests were conducted before and after twelve weeks of the experimental training on the selected variables of college men.

Statistical Technique

The collected data was analyzed by statistical technique of paired 't' test to analyze the difference between the pretest and post test scores of each group and Independent 't' test was used used to compare the difference between experimental and control group. 0.05 level of confidence was fixed for all the variables to test the level of significance. It was considered as sufficient for the present study.

RESULTS OF THE STUDY

Table-2

Paired t-test analysis of pre-test and post-test scores on selected psychological variables of experimental group

Variable	Test	N	Mean	SD	Mean Difference	t	Df	p
Competitive Anxiety	Pre	15	34.40	1.12	5.40	41.24*	14	0.001
	Post	15	29.00	1.31				
Self-Confidence	Pre	15	27.60	1.12	6.26	53.02*	14	0.001
	Post	15	33.87	1.40				
Mental Toughness	Pre	15	51.60	1.12	7.73	42.56*	14	0.001
	Post	15	59.33	1.63				

* Significant at.05 level of confidence

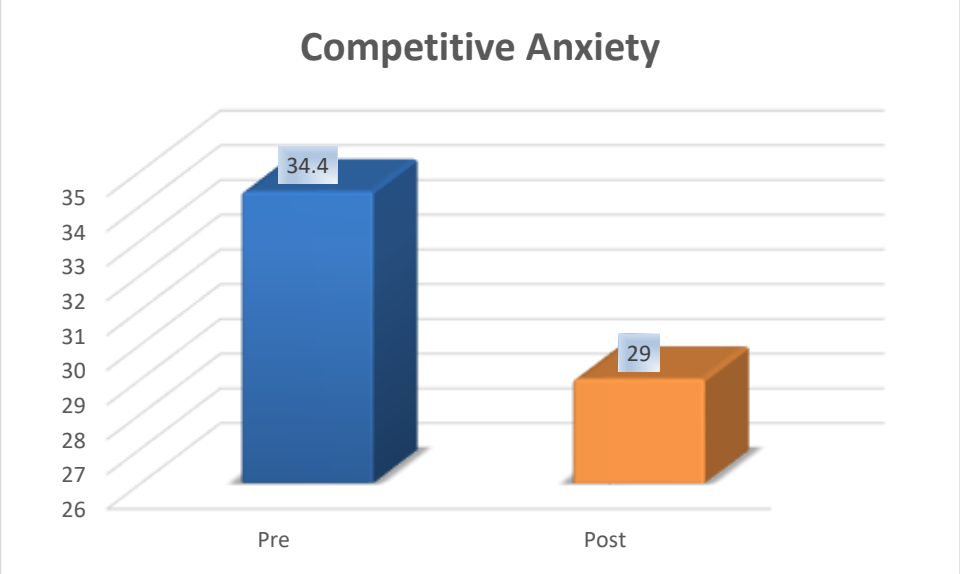
The results revealed that there was a significant difference between the pre-test and post-test scores of competitive anxiety, $t(14) = 41.24$, $p < .05$. The average scores revealed that the competitive anxiety was lower with regards to pre-test ($M = 34.40$, $SD = 1.12$) to post-test ($M = 29.00$, $SD = 1.31$), indicating a better anxiety level. Likewise there was a big variation in self-confidence, $t(14) = 53.02$, $p < .05$. There was an improvement in the mean scores between pre-test ($M = 27.60$, $SD = 1.12$) and post-test ($M = 33.87$, $SD = 1.40$) suggesting that the players had improved self-confidence. In addition, mental toughness was also significantly improved $t(14) = 42.56$, $p <.05$. The means have risen between the pre-test ($M = 51.60$, $SD = 1.12$) and post-test ($M = 59.33$, $SD = 1.63$), which is a positive effect of the training programme on mental toughness.

Overall, the findings indicate that High-Intensity Interval Training had a significant effect on the selected psychological variables of the experimental group.

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Figure-1

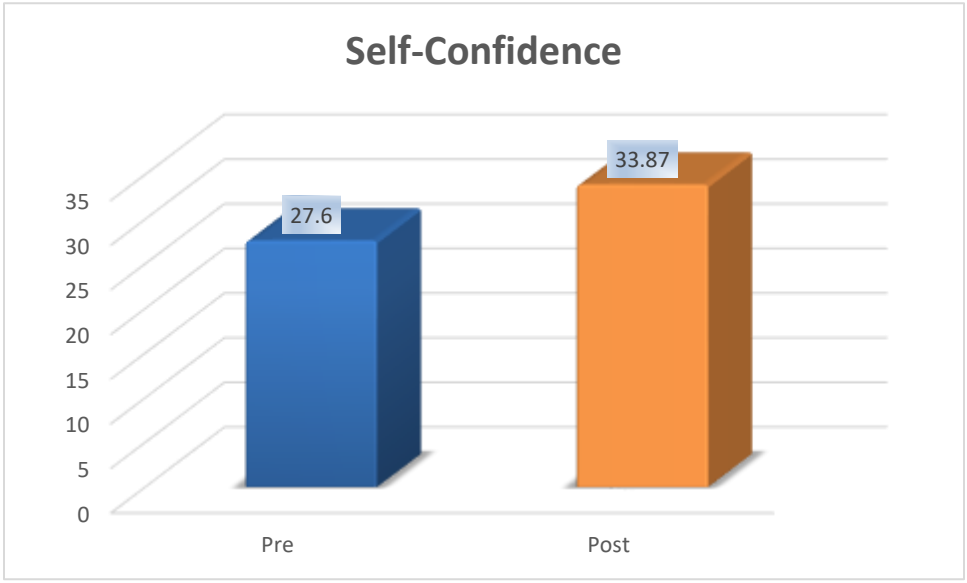
Bar diagram showing the pre-test and post-test competitive anxiety of the experimental group



The bar diagram shows the means of competitive anxiety in the case of the experimental group, both pretest and posttest. The findings reveal that the average score of competitive anxiety was lower at the post-test (M = 29.00) compared to pre-test (M = 34.40). Given that a decrease in the competitive anxiety level was a sign that there was an improvement, the mean scores in the observed case were decreased meaning that the High-Intensity Interval Training programme was effective in decreasing the levels of anxiety among the field hockey players. Therefore, the statistical results are evidently backed by the graphical depiction, as the training has a positive impact on competitive anxiety.

Figure-2

Bar diagram showing the pre-test and post-test self-confidence of the experimental group



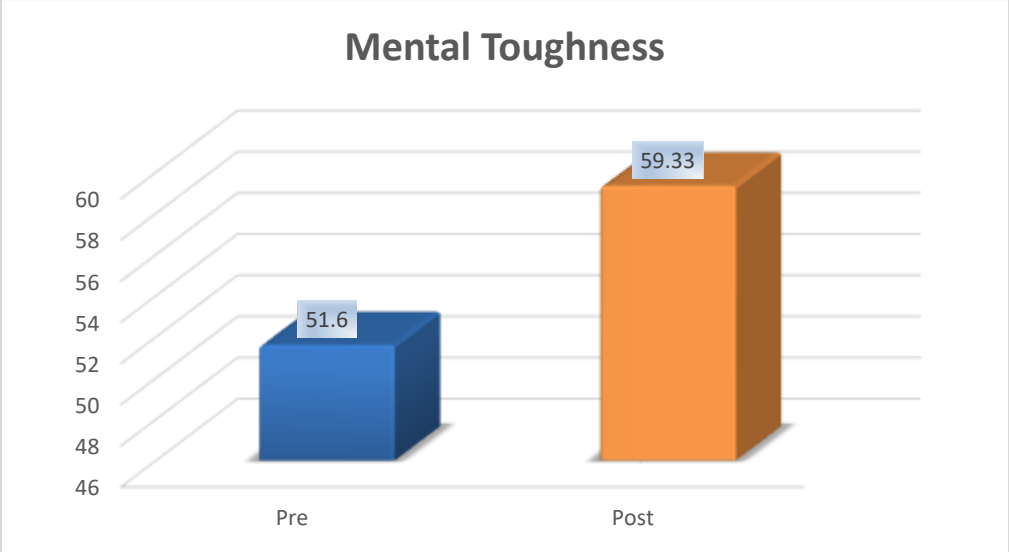
The bar diagram displays the mean scores of self-confidence in the experimental group in pre-test and post-test. These findings suggest that the average score of self-confidence rose during the pre-test (M = 27.60) and post-test (M = 33.87). Given the fact that an increase in self-confidence is an indicator of improvement, the increasing mean scores observed indicate that the High-Intensity Interval Training programme positively influenced improvement in self-confidence of the field hockey players. The graphical representation, therefore, reinforces the statistical results, which

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show a high enhancement of self-confidence as a result of the training intervention.

Figure-3

Bar diagram showing the pre-test and post-test mental toughness of the experimental group



The bar diagram demonstrates the mean value of the pre-test and post-test mental toughness of the experimental group. The results show that the mean score of mental toughness increased from pre-test (M = 51.60) to post-test (M = 59.33). Because an increase in mental toughness is a sign of improvement, the observed increase in mean scores is an indicator that the High-Intensity Interval Training programme positively impacted on the increase in mental toughness amongst the field hockey players. Therefore, the statistical results are corroborated by the graphical one, which shows that mental toughness has greatly improved after the training intervention.

Table-3

Paired t-test analysis of pre-test and post-test scores on selected psychological variables of control group

Variable	Test	N	Mean	SD	Mean Difference	t	Df	p
Competitive Anxiety	Pre	15	33.40	1.12	0.13	0.62	14	0.55
	Post	15	33.27	1.48				
Self-Confidence	Pre	15	28.60	1.12	0.27	1.47	14	0.16
	Post	15	28.87	1.40				
Mental Toughness	Pre	15	52.60	1.12	0.27	1.47	14	0.16
	Post	15	52.87	1.40				

* Significant at.05 level of confidence

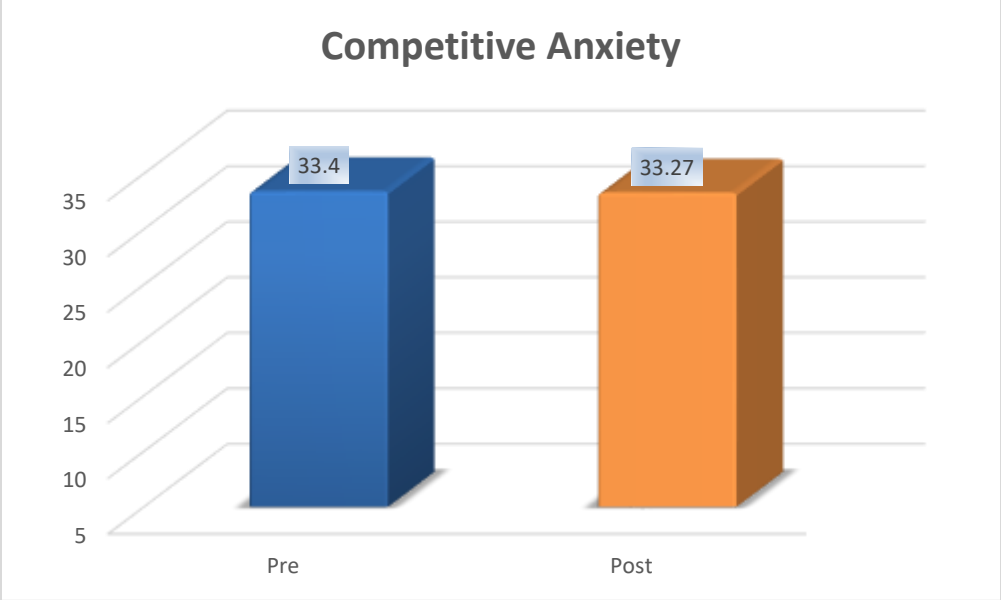
The findings showed that the competitive anxiety difference between the pre-test and post-test scores did not differ significantly t(14) = 0.62, p >.05. The average scores indicated that there was a slight reduction in the mean scores between pre-test (M = 33.40, SD = 1.12) and the post-test (M = 33.27, SD = 1.48), although this was not significant. Likewise, self-confidence was not significantly different, t(14) = 1.47, p >.05. There was a slight increase in mean scores between pre-test (M = 28.60, SD = 1.12) and post-test (M = 28.87, SD = 1.40) although this was not significant. Similarly, there was no significant difference in mental toughness between pre-test and post-test t(14) = 1.47, p > .05. Mean scores went slightly higher in pre-test (M = 52.60, SD = 1.12), and post-test (M = 52.87, SD = 1.40), which did not show any significant difference.

In general, the results have shown that the chosen psychological variables did not significantly improve in the control group, which did not have High-Intensity Interval Training.

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Figure-4

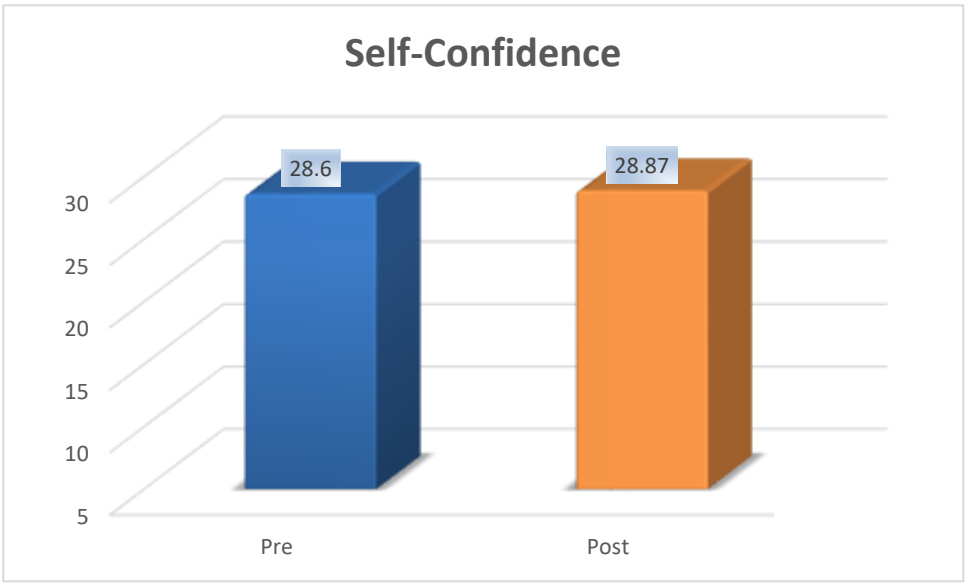
Bar diagram showing the pre-test and post-test competitive anxiety of the control group



The bar chart is used to demonstrate the means of the pre-test and post-test of competitive anxiety of the control group. The results show a slight decrease in the mean score from pre-test (M = 33.40) to post-test (M = 33.27). Nevertheless, the difference in the average scores is insignificant, which means that there was no significant change in the level of competitive anxiety in the participants. The fact that the control group was not exposed to High-Intensity Interval Training means that the difference that is not significant might have been due to normal variation, and not any systematic training effect. Therefore, the statistical results are substantiated by the graphical presentation, which shows that there is no significant difference in the level of competitive anxiety of the control group.

Figure-5

Bar diagram showing the pre-test and post-test self-confidence of the control group



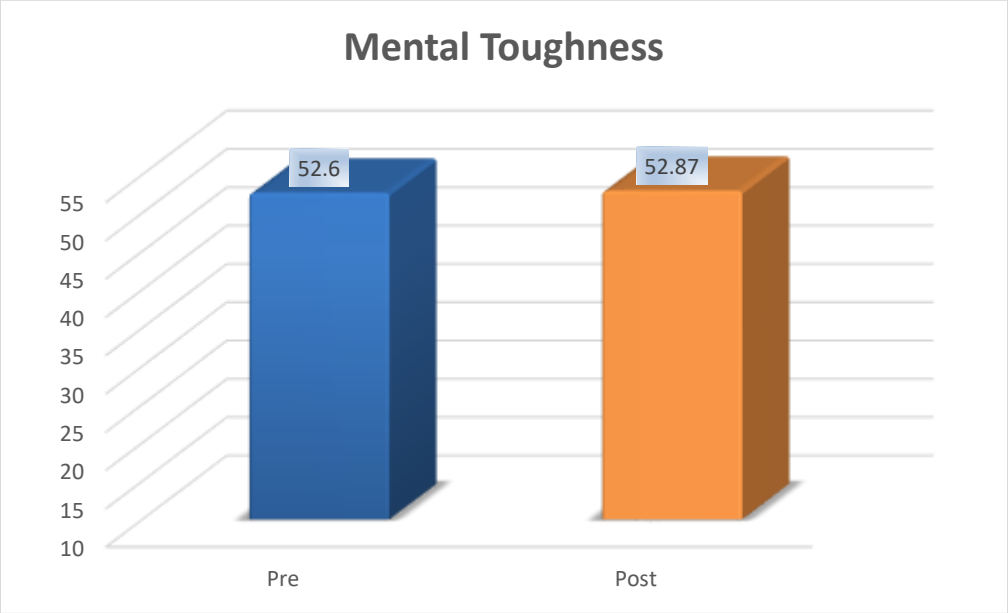
The bar diagram shows the pre- and post-test average scores of self-confidence in the control group. The findings show that there is a small change between pre-test (M = 28.60) and post-test (M = 28.87), which is an increase in the mean score. The rise in self-confidence is however low implying that the players did not show any significant improvement. The minor change observed might be attributed to normal variation and not any training effect as the control group did not receive any High-Intensity Interval

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Training. So, the statistical results are confirmed by the graphical representation, which shows that there is no significant difference in self-confidence among the control group.

Figure-4.6

Bar diagram showing the pre-test and post-test mental toughness of the control group



The bar diagram depicts the mean scores of mental toughness of the control group before and after the test. The findings indicate that there is a minor improvement in the pre-test (M = 52.60) to post-test (M = 52.87) mean score. The mental toughness improvement is however slight which means that there was no significant change in the players. The small change observed may be due to normal variation and not to some structured training effect because the control group was not subjected to High-Intensity Interval Training. The statistical findings are therefore supported by the graphical representation, that there is no significant change in mental toughness in the control group.

DISCUSSION ON THE RESULTS

The current research examined the impact of High-Intensity Interval Training (HIIT) on the chosen psychological in field hockey players. The results were clear that, the experimental group improved significantly all the variables chosen, whereas the control group did not experience significant improvement. These findings can be validated by a number of earlier studies in the sphere of sport science and exercise physiology.

HIIT on Psychological Variables

Significant psychological variables were also improved in the experimental group in the current study. This could be as a result of increase in self-confidence, motivation as well as perceived exertion after a regular exposure with high intensity training sessions. HIIT also aids in athletes being mentally tough and able to cope in fatigue situations.

These results are endorsed by Slimani et al. (2016) who found that high-intensity training has a beneficial effect on the psychological well-being, motivation, and mental resilience of athletes. Likewise, Hoffman (2014) noted that high-intensity training programs with structure enhance psychological preparedness and competitive confidence in team sport players.

The control group in the current research did not experience any significant changes in both psychological. This result indicates that practice is not enough to achieve performance improvements that can be measured in the absence of organized high-intensity training. The same was noticed by Impellizzeri et al. (2006) who found that training interventions are required to generate substantial adaptations in variables of performance, but routine activity alone leads to minimal change.

All in all, the results of the current research support the conclusion that High-Intensity Interval Training is a powerful training tool to enhance psychological variables in field hockey players. Experimental group was significantly improved and control group was relatively stable. Consequently, it may be inferred that HIIT is a very effective way of conditioning to improve performance in field hockey.

CONCLUSION

Based on the findings of the study, it can be concluded that High-Intensity Interval Training (HIIT) had a significant positive effect on selected psychological variables of field hockey players in the experimental group. In contrast, the control group did not show any significant improvement in psychological during the study period. Therefore, it can be concluded that HIIT is an effective training method for enhancing psychological readiness of field hockey players.

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