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Assessment of Mental Skill Levels in Field Hockey Players: A Comparative Approach

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Abstract

Field hockey is one of the fastest moving games played in the modern Olympic Games. The game is a combination of a high level of physical fitness, along with mental skills practicing outmaneuvering one's opponents. The aim of this research was to investigate and compare the mental skill status in field hockey players based on the level of participation. For the purpose of the present study, a sample comprising 44 field hockey players from various colleges of the University of Delhi was randomly chosen and consisted of 9 national-level players, 16 university-level players and 19 college-level players. A descriptive psychological profile was administered to the players using the Ottawa Mental Skills Assessment Tool (OMSAT-3) on a 5-point Likert scale. There are altogether 48 items in the questionnaire, investigating three main skills, including: foundation, psychomotor, and cognitive mental skills with sub-skills for all. Mean and standard deviation were calculated to explore dispersion of scores, while analysis of variance (ANOVA) was used to determine differences in the athletes' sub skills across latent constructs by domain. There were no differences between and within groups in core skills of foundation (self-confidence, goal setting, and commitment); psychomotor (activation control, relaxation, fear control, and stress reaction) and for cognitive mental skills (mental practice ability, competition planning, imaginary ability, refocusing attention, and focusing attention). It is concluded that the level of participation has no impact on mental proficiency status among field hockey players. However, mental skills are also important in terms of performance and therefore athletes should be given structured mental training alongside physical and technical preparation to maximize their potential.

Keywords: Field hockey, Mental ability, OMSAT-3, Core skills, Athlete performance.

INTRODUCTION

The game of field hockey is a team sport played between two teams, each consisting of 11 players (10 outfield players and one goalkeeper) and with up to four substitutes. The game is highly physically demanding twisting, jumping, changing direction and sudden stopping, passing etc. (Kruger, 2010). In a bid to make the game faster, it was changed from two halves of 35 minutes to four quarters of 15 minutes in 2015. Field hockey is a fast-paced team sport which includes demanding physical condition, an essential determinant of the athlete's activity and wellbeing (Lim, 2021; Akter *et al*., 2025). Mental toughness in Field Hockey On top of all that physical skill, field hockey players also have to be mentally tough. Athletes, coaches, sports psychologists and even sport scientists have been stressing the contribution of psychological skills to athletic performance for years. It would appear that attention to developing mental abilities is just as important as physical ones for performance improvement through the combination of both physical and mental training (Maleki *et al*., 2014). While it has been questioned the genetic role of family in producing elite athletes (Wang, 2010), herein described explanations underscore psychological and strategic preparation.

It takes more than just being big and strong to be good in the competitive arena of sports. Athletes need to manage pressure, cope with distractions and effectively use their pre performance routines (Weinberg, 2007; Gould *et al*., 2002; Mola *et al*., 2025). One of the most striking differences between successful

and less successful athletes is their ability to adhere to mental preparation plans and pre-competition routines (Jean & R, 2010). So, superior performance in sports results from a combination of particular ability, extensive training and appropriate psychological makeup. Elite athletes also possess a higher capability to evoke positive affects compared to non-elite athletes (Robazza & Bortoli, 2007).

Mental skills are then referred to those psychological factors that promote performance, as well as very specific kind of sport-related abilities and techniques (Weinberg, 2007; Cox & R. H., 2007). Such skills are acquired and maintained by regular training and learning (Jean & R, 2010). Peak performance is probably attained when physical and tactical fitness, skill and psychological preparation reach optimal levels (Yun *et al*., 2006; Reza *et al*., 2024). Many have studied the mental abilities of elite performers. For instance, (Orlick & T, 2008) described mental success factors such as commitment, goal setting, imagery, concentration and planning whereas (Gould *et al*., 2002) observed that successful Olympians reported participating in more deep mental practice than less successful athletes. Customized interventions of a structured program including regular exercise, proper diet pattern, and maintaining healthy life style are indispensable to improve the health status (Haq & Rahman, 2025).

Some of the most critical psychological characteristics in elite athletes are confidence, motivation, imagery, and self-talk; each assist the athlete to facilitate preparation and maintain performance at superior levels (Durand-Bush & Salmela, 2002). Self-talk, motivation, imagination, and concentration and psychophysical skills mediate sports performance outcomes (Gucciardi *et al*., 2009; Jones *et al*., 2002; Rongian, 2007). Literature confirms that goal setting, relaxation and mental imagery are important for athletic success (Vealey, 2007; Crust, 2007), and the general purpose of psychological interventions is to establish an ordered mental territory via which athletes may perform (Jean & R, 2010).

Because athletes are usually matched in terms of their physical skill, differences in performance often result from the psychological skills (Van den Heever *et al*., 2008; Khatun *et al*., 2025). Psychological skills development is hence an important element in sports development, as ultimate of success at high levels require preparation physically and mentally (Kremer, 2012; Rahman & Islam, 2021). This mind-body unity has long been appreciated (e.g. ancient Greek athletes incorporated psychological elements into their four-day pre-competition tetrad routine, such as concentration and relaxation; (Kremer, 2012). When mental rehearsal is used in conjunction with physical training, performance returns are optimized thereby highlighting the integration of thought and action in competitive sport (McPherson, 2000; Roy *et al*., 2025).

Field hockey is a fast-paced game that requires excellent physical conditioning and psychological fortitude to perform at a high level under pressure. Physical abilities tend to be comparable between athletes from various levels of competition; however, mental skills may affect the performances. Knowing the mental skill level of field hockey players at national, university and college levels may provide direction about strengths and weaknesses for improvement, inform goal-specific mental-skills training programs and improve performance. Thus, the aim of this study was to investigate the mental skill profiles of field hockey players, with regards to their level of participation.

METHOD

Participants

A team of 44 hockey players were randomly selected from the University of Delhi, India (various colleges). Of these, 9 were national level, 16 were university level, and 19 were college level players. We limited our study group to players who had played at least one of the three last tournaments. A descriptive analysis was carried out on the psychological profiles of field hockey players.

Variables and Criterion Measures

Table 1: Variables of the study

Mental Skill Variables	
Foundation Skills	Self Confidence
	Goal Setting
	Commitment
Psychomotor Skills	Activation Control
	Relaxation
	Fear Control
	Stress Reaction
Cognitive Mental Skills	Mental Practice Ability
	Competition Planning
	Imaginary Ability
	Refocusing Attention
	Focusing Attention

The purpose of this study was to measure the mental skill status of athletes using the Ottawa Mental Skills Assessment Tool-3 (OMSAT-3; (Durand-Bush *et al*., 2001) after informed consent from every player. Forty-four hockey players of University of Delhi were taken as a sample for the study. Advertisement the players were selected from IGIPESS, KMC, SRCC, SLC, SLC (Evening) and SGTB Khalsa College. Their participation was at National, Inter-University Zonal and Inter-College levels. The OMSAT-3 scale consisted of 48 items that were categorized in three sections. The first factor quantified essential mental skills (self-confidence, goal setting and commitment), the second one measured psychomotor mental skills (activation control, relaxation, fear control and stress reaction) and third assessed cognitive mental skills (mental practice ability; competition planning; imagery ability; refocusing attention and focusing attention). They were rated with a 5-point Likert scale.

During the evaluation, the questionnaire was collaboratively administered to participants who were given a brief introduction and asked their consent; data was received that included both mobile phone number and e-mail. Demographics Demographic data included the names of the colleges and level of participation by students.

Statistical Analysis

Descriptive statistical analyses were performed because of the nature of the study design. The mean was calculated to assess the three mental skill scales—Foundation, Psychomotor, and Cognitive. Standard deviations were also computed for each of these scales to examine the variability of scores. In addition, a one-way analysis of variance (ANOVA) was performed to assess differences in athletes' sub-skills across each domain. All analyses were performed using IBM SPSS Statistics (Version 27).

RESULT AND DISCUSSION

Table 2: Descriptive statistics of foundation mental skills

Variables	Players	n	Mean	Std. Dev.	Std. Error	Minimum	Maximum
Self Confidence	National	9	4.56	0.33	0.11	4.25	5.00
	University	16	4.52	0.38	0.10	3.75	5.00
	College	19	4.24	0.77	0.18	2.25	5.00
Goal Setting	National	9	4.00	0.65	0.22	2.50	5.00
	University	16	3.98	0.48	0.12	3.25	4.75
	College	19	3.92	0.60	0.14	2.75	5.00
Commitment	National	9	3.78	0.42	0.14	2.75	4.00
	University	16	3.58	0.63	0.16	2.50	5.00
	College	19	3.61	0.72	0.16	2.25	5.00

Table 2 shows the mean scores and standard deviations for self-confidence, goal setting, and commitment among national, university, and college-level players. National-level players had slightly higher scores across all skills, with self-confidence (M = 4.56, SD = 0.33), goal setting (M = 4.00, SD = 0.65), and commitment (M = 3.78, SD = 0.42). Differences between groups were small, and variability was higher among college players, indicating more inconsistency at lower competitive levels.

Table 3: One-way ANOVA of foundation mental skills of hockey players

Variables	Groups	Sum of Squares	df	Mean Square	F-ratio	p-value
Self Confidence	Between Groups	0.94	2	0.47	1.41	0.25
	Within Groups	13.59	41	0.33		
Goal Setting	Between Groups	0.05	2	0.03	0.08	0.92
	Within Groups	13.32	41	0.32		
Commitment	Between Groups	0.25	2	0.13	0.31	0.74
	Within Groups	16.68	41	0.41		

*. Significant at 0.05 level

A one-way ANOVA (Table 2) was conducted to examine differences in foundation mental skills (self-confidence, goal setting, and commitment) among hockey players. The results showed no statistically significant differences between groups for self-confidence, $F(2, 41) = 1.41$, $p = .25$, goal setting, $F(2, 41) = 0.08$, $p = .92$, and commitment, $F(2, 41) = 0.31$, $p = .74$. These results indicate that group membership did not have a significant effect on any of the measured mental skills.

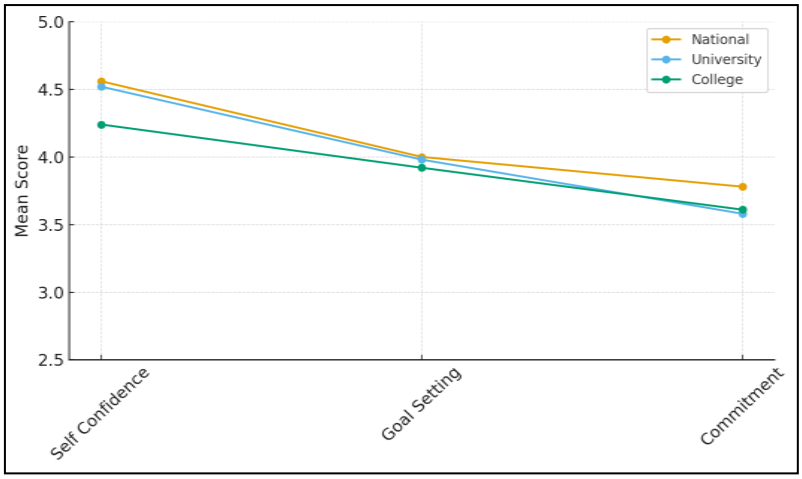

Figure 1: Mean scores of foundation mental skills across groups

Table 4: Descriptive statistics of psychomotor mental skills

Variables	Players	n	Mean	Std. Dev.	Std. Error	Minimum	Maximum
Activation Control	National	9	3.78	0.49	0.16	2.75	4.25
	University	16	3.44	0.46	0.12	2.75	4.25
	College	19	3.47	0.49	0.11	2.25	4.25
Relaxation	National	9	3.53	0.64	0.21	2.50	4.50
	University	16	3.14	0.47	0.12	2.25	4.00
	College	19	3.36	0.58	0.13	2.50	4.25
Fear Control	National	9	3.17	0.81	0.27	1.75	4.25
	University	16	3.03	0.57	0.14	2.00	4.25
	College	19	3.07	0.58	0.13	1.75	4.25
Stress Reaction	National	9	3.03	0.72	0.24	2.00	4.00
	University	16	2.77	0.69	0.17	1.75	3.75
	College	19	2.91	0.68	0.16	2.00	4.25

Table 4 presents the descriptive statistics for psychomotor mental skills—activation control, relaxation, fear control, and stress reaction—among national, university, and college-level players. National-level players generally scored higher across all skills (e.g., activation control: M = 3.78, SD = 0.49; relaxation: M = 3.53, SD = 0.64) compared to university and college players. Differences between groups were small, and variability was more pronounced among college players, indicating some inconsistency in psychomotor mental skills at lower competitive levels.

Table 5: One-way ANOVA of psychomotor mental skills of hockey players

Variables	Groups	Sum of Squares	df	Mean Square	F-ratio	p-value
Activation Control	Between Groups	0.75	2	0.37	1.64	0.21
	Within Groups	9.35	41	0.23		
Relaxation	Between Groups	0.92	2	0.46	1.49	0.24
	Within Groups	12.72	41	0.31		
Fear Control	Between Groups	0.11	2	0.05	0.14	0.87
	Within Groups	16.21	41	0.40		
Stress Reaction	Between Groups	0.42	2	0.21	0.44	0.65
	Within Groups	19.52	41	0.48		

*. Significant at 0.05 level

A one-way ANOVA (table 5) was conducted to evaluate differences in psychomotor mental skills (activation control, relaxation, fear control, and stress reaction) among hockey players. The analysis revealed no statistically significant differences between groups for activation control, $F(2, 41) = 1.64$, $p = .21$, relaxation, $F(2, 41) = 1.49$, $p = .24$, fear control, $F(2, 41) = 0.14$, $p = .87$, and stress reaction, $F(2, 41) = 0.44$, $p = .65$. These findings suggest that group differences did not significantly impact these psychomotor mental skills.

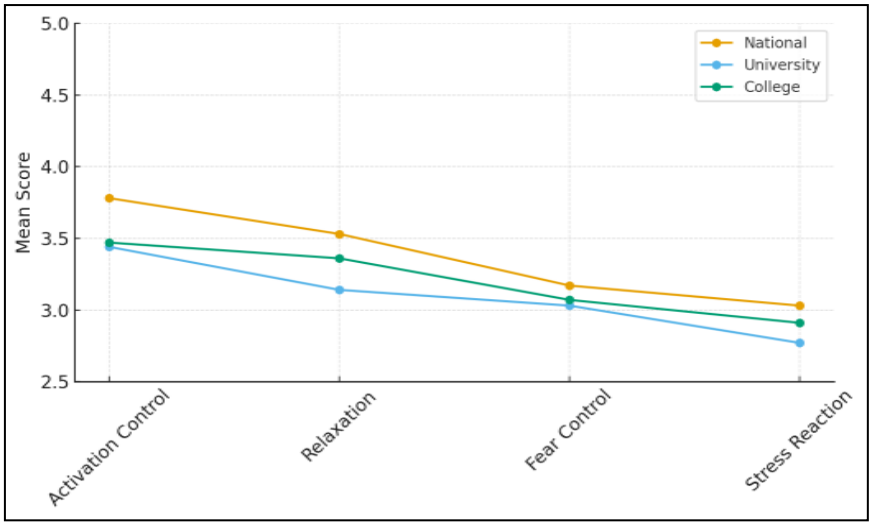

Figure 2: Mean scores of psychomotor mental skills across groups

Table 6: Descriptive statistics of cognitive mental skills

Variables	Players	n	Mean	Std. Dev.	Std. Error	Minimum	Maximum
Mental Practice Ability	National	9	3.97	0.44	0.15	3.50	5.00
	University	16	3.95	0.54	0.14	2.75	4.75
	College	19	3.67	0.66	0.15	2.00	4.75
Competition Planning	National	9	4.11	0.49	0.16	3.50	5.00
	University	16	3.70	0.45	0.11	3.00	4.50
	College	19	3.67	0.57	0.13	2.50	4.50
Imaginary Ability	National	9	3.58	0.57	0.19	2.50	4.50
	University	16	3.66	0.64	0.16	2.25	4.50
	College	19	3.64	0.48	0.11	2.25	4.25
Refocusing Attention	National	9	3.17	0.95	0.32	1.25	4.00
	University	16	3.17	0.52	0.13	2.50	4.25
	College	19	3.42	0.49	0.11	2.25	4.50
Focusing Attention	National	9	2.83	0.96	0.32	1.00	4.00
	University	16	2.64	0.80	0.20	1.50	4.25
	College	19	3.08	0.92	0.21	1.50	4.75

Table 6 shows the descriptive statistics for cognitive mental skills—mental practice ability, competition planning, imaginary ability, refocusing attention, and focusing attention—among national, university, and college-level players. National-level players generally scored higher in mental practice ability (M = 3.97, SD = 0.44) and competition planning (M = 4.11, SD = 0.49), while differences in imaginary ability, refocusing attention, and focusing attention were minimal across groups. Overall, scores were relatively consistent, with slightly higher variability observed among college-level players, suggesting minor differences in cognitive mental skills based on competitive level.

Table 7: One-way ANOVA of cognitive mental skills of hockey players

Variables	Groups	Sum of Squares	df	Mean Square	F-ratio	p-value
Mental Practice Ability	Between Groups	0.90	2	0.45	1.35	0.27
	Within Groups	13.71	41	0.33		
Competition Planning	Between Groups	1.30	2	0.65	2.51	0.09
	Within Groups	10.67	41	0.26		
Imaginary Ability	Between Groups	0.03	2	0.02	0.05	0.95
	Within Groups	13.02	41	0.32		
Refocusing Attention	Between Groups	0.68	2	0.34	0.89	0.42
	Within Groups	15.60	41	0.38		
Focusing Attention	Between Groups	1.68	2	0.84	1.07	0.35
	Within Groups	32.13	41	0.78		

*. Significant at 0.05 level

A one-way ANOVA (table 7) was conducted to explore differences in cognitive mental attention, and focusing attention) among hockey players. The results showed no statistically significant differences between groups for mental practice ability, $F(2, 41) = 1.35$, $p = .27$, competition planning, $F(2, 41) = 2.51$, $p = .09$, imaginary ability, $F(2, 41) = 0.05$, $p = .95$, refocusing attention, $F(2, 41) = 0.89$, $p = .42$, and focusing attention, $F(2, 41) = 1.07$, $p = .35$. These results indicate no significant differences in cognitive mental skills based on group membership skills (mental practice ability, competition planning, imaginary ability, refocusing.

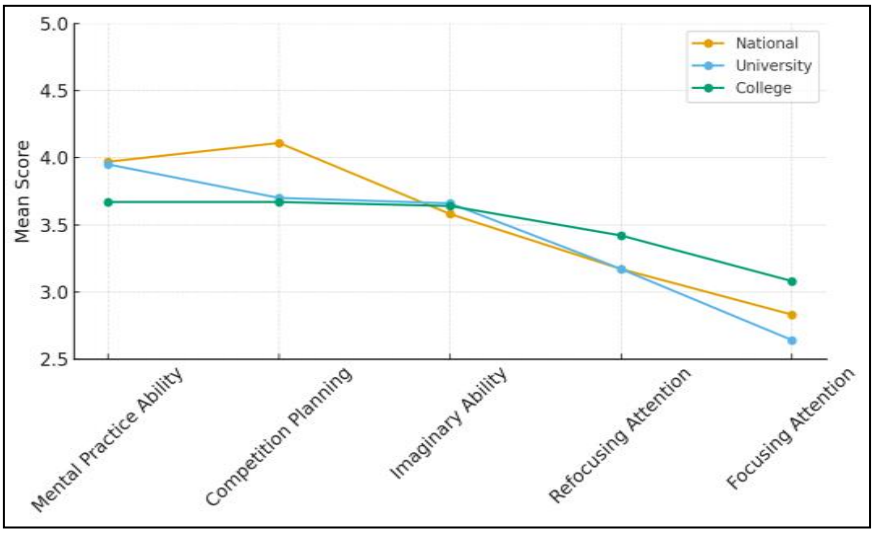

Figure 3: Mean scores of cognitive mental skills across groups

The present study found no statistically significant differences in foundation mental skills (self-confidence, goal setting, and commitment), psychomotor mental skills (activation control, relaxation, fear control, and stress reaction), and cognitive mental skills (mental practice ability, competition planning, imagery ability, refocusing attention, and focusing attention) among hockey players. Similar research on volleyball and hockey players and reported no significant differences in cognitive mental skills; however, significant differences were found in foundation and psychomotor skills since the athletes represented different sports (Muasya & Vincent, 2018). In a study on South African university field hockey players, revealed borderline significant differences in activation control and highlighted the highest scores for self-confidence, commitment, and goal setting, whereas our study found no significant differences in these skills (Eloff *et al*., 2011). Similarly, female university field hockey players and found practical significance in achievement motivation, goal setting, and fear control, while the present study on male players revealed no such differences (Kruger, 2010). Olympic qualifiers scored higher in all subs kills compared to non-qualifiers, but in contrast, the current study found lower scores in all three categories, showing similarities with Olympic non-qualifiers (Íris Mist Magnúsdóttir, 2017). In a study on the Iranian national team at the Asian Games (2006 and 2018), observed a decline in concentration, focusing, refocusing, fear control, stress reaction, and self-confidence in 2018 compared to 2006, while no significant differences were found in goal setting, commitment, and activation, consistent with our findings (Rahmani *et al*., 2020). Likewise, a significant difference between elite and sub-elite basketball players and gymnasts (Rice *et al*., 2016), whereas the present study found no significant differences among hockey players, suggesting sport-specific variations in mental status. Other study found significant differences in psychological skills between athletes in team and individual sports (Kajbafnezhad *et al*., 2011). However, study reported no significant differences in the psychological skills of Iranian elite swimmers, which is consistent with our results (Moghadam *et al*., 2020). A separate study reported similar outcomes in psychomotor and cognitive skills but opposite results in foundation skills when compared with the present study (Zawawi *et al*., 2013). In addition, (Fairouz Azaiez, 2013) revealed mean differences across all skills that were statistically significant, while (Znazen *et al*., 2017) showed significant results for foundation and psychomotor skills but not for cognitive skills, further emphasizing that goal setting, commitment, stress reaction, fear control, imagery, competition planning, and mental practice skills were higher in elite sprinters than in endurance runners. Further evidence also observed significant differences in goal setting, self-confidence, commitment, stress reaction, fear control, activation, relaxation, imagery, mental practice, focusing, and refocusing (Bahmani *et al*., 2016). Contrastingly, found no differences in terms of foundation, psychomotor and cognitive skills but identified a significant difference across focus; however, this only partially corresponds to our findings (Mostafa & Mansour, 2016). Contradictory findings reported elite players scoring significantly higher in all mental attributes than sub-elite (Pashabadi *et al*., 2011), and male hockey players rating better on both goal setting, activation, mental practice and competition planning, the

present study's results oppose these (Dominikus *et al*., 2009).

This study is yielding primary information about foundation, psychomotor and cognitive mental skills of male hockey players. Implications for practitioners are that findings may be used as a guide in the delivery of mental skills training to develop self-confidence, goal setting, commitment and cognitive strategies for performance enhancement and athlete development.

CONCLUSIONS

There were no significant differences in foundation, physical or cognitive mental skills among national, university and college field hockey players. This would imply that level of play did not affect psychological skill status in this group. Nevertheless, mental skills are as important in performance and thus structured psychological training should be offered alongside physical and technical preparation to maximize the potential of athletes.

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