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**Emotional intelligence and psychological skills application among female field-hockey players**Nicola Tinkler<sup>1\*</sup>, Julius Jooste<sup>2</sup> and Ankebé Kruger<sup>1</sup>

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**Author Note**

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### Abstract

Emotional intelligence is often associated with higher psychological functioning, leading to an increase in the awareness of psychological skills application in sports. We examined the relationship between emotional intelligence and psychological skills application among a sample of senior-level South African female field-hockey players ( $n = 60$ ). Participants completed the Emotional Intelligence Scale (EIS) and the Psychological Skills Inventory (PSI). We utilised bivariate correlations to assess the relationship between variables and linear regression to predict players' level of psychological skills application from emotional intelligence scores. Results indicated several significant correlations between the dimensions of emotional intelligence and players' psychological skills. Further, emotional intelligence seems to be a significant predictor of mental rehearsal and total psychological skill scores. Emotional intelligence appears to be a potential facilitator of psychological skills application in high level field-hockey participation and performance.

*Keywords:* emotions, hockey, mental skills, psychological demands, psychological skills, sports

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## Introduction

In sports, psychological skills application (e.g. positive self-talk, goal setting, imagery, and self-talk) plays a vital role in achieving optimal performance (Sajjan, 2018). An athlete with an unwavering mindset during competition frequently emerges as the winner, especially when competing against equally skilled athletes (Parveen, 2016). Conversely, athletes with sporadic or fluctuating thoughts and emotions before or during competition often report reduced levels of performance (Sajjan, 2018). Moreover, successful performances in team sports presumes the ability to accurately perceive and anticipate one's own and other players' actions and emotions. Emotional intelligence (EI) refers to the ability to accurately identify one's own and others' emotions, differentiate among them, and apply the information to steer one's thinking and actions (Salovey & Mayer, 1990). EI consists of five distinct features: self-awareness, self-regulation, motivation, empathy, and social skills (Goleman, 2004; Serrat, 2017). In field-hockey, players need to recognise and regulate their own emotions whilst maintaining effective communication with teammates. Additionally, they need to make fast decisions based on opponents' offensive/ defensive play (Perlini & Halverson, 2006). In support of this notion, research suggests that successful field-hockey players are often characterised by their psychological qualities such as demonstrating high motivation, self-confidence, effective anxiety control, quality mental preparation, concentration ability, and goal setting (Elferink-Gemser et al., 2008; Kruger, 2010). We are not aware of any studies that examined the extent to which EI predicts psychological skills among field-hockey players. Therefore, we aimed to address this gap in knowledge by examining the relationship between EI and psychological skills in South African hockey players.

### ***The link between EI and psychological skills in sports***

Earlier investigations into athletes' cognitions, emotions, and behaviour in high-pressure situations implied a strong relationship between EI and psychological skills application in sports (Lane et al., 2009; Soflu et al., 2011). For example, Lane and colleagues (2009) identified a significant positive relationship

between EI and psychological skills among a sample of male student-athletes who competed in team sports (soccer, field-hockey, and rugby). Correspondingly, goal setting, relaxation ability, maintaining confidence, and concentration associated significantly with EI among elite male volleyball players (Bahrololoum et al., 2012). In principle, EI may be inadvertently augmented with psychological skills training in sports (Lane et al., 2009). This notion is based on the belief that psychological skills prime athletes' cognitions, emotions, and behaviours in high-pressure situations.

### ***Measures of EI and psychological skills***

The Emotional Intelligence Scale (EIS: Schutte et al., 1998) and the Mayer-Salovey Caruso EI Test (MSCEIT: Mayer et al., 2002) are two of the most commonly used scales in social sciences research. These measures differentiate between adaptive abilities such as appraisal and expression of emotion (perception of emotions); regulation of emotion (managing own and others' emotions); and utilisation of emotions in solving problems (utilisation of emotions: Salovey & Mayer, 1990). In a team-sport setting, perception of emotion would imply athletes' ability to recognise their team members' and opponents' thoughts and feelings prior and/or during competition (Tamminen et al., 2016). Managing one's own emotions refers to the ability to quickly perceive and respond to felt emotions and to better express those emotions to others (Salovey & Mayer, 1990). Utilisation of emotions refers to being able to utilise emotions to remain flexible and creative, especially during problem-solving (Salovey & Mayer, 1990). A person with high EI is presumed to have psychological qualities (i.e. achievement motivation, goal setting, anxiety control, maintaining confidence, concentration, and mental rehearsal) that are important to successful athletes. Of the psychological skill measures in sports, Bull's Mental Skills Questionnaire (BMSQ: Bull et al., 2005) and the Psychological Skills Inventory in Sport (PSIS: Wheaton, 1998) are among the most used for measuring and psychologically profiling athletes.

### ***Sex, EI, and psychological skills***

Regardless of the incremental nature of EI (Goleman, 2001), sex comparison studies have noted that females tend to demonstrate a higher degree of EI compared to males (Joseph & Newman, 2010; Patel, 2017). In comparison, females are also likely to score higher in self-awareness, interpersonal relationship skills, self-regard, and appear to be more emotionally aware and empathetic than males (Meshkat & Nejati, 2017; Palmer et al., 2003). Moreover, female youth athletes are likely to outscore their male counterparts in psychological skills such as goal setting and concentration (Von Guenther & Hammermeister, 2007). However, in an earlier investigation, Elferink-Gemser (2005) reported higher levels of self-confidence, anxiety control, and mental preparation among youth male athletes. This underscores the confounding role sex plays in the psychological make-up of athletes.

### ***Goal of the study***

We aimed to address the following research question: What is the relationship between EI and psychological skills application in female field-hockey players? Findings may inform interventions that aim to improve hockey players' EI, which could optimise psychological skills utilisation and application. Moreover, players, sport psychologists, and coaches could benefit from the dissemination of the findings on how emotional awareness and control influence the concurrent application of psychological skills in sports.

### **Methods**

#### ***Participants and setting***

Participants were a convenient sample of senior-level South African female field-hockey players ( $n = 60$ ; mean age = 21.57 year,  $SD = 3.65$  years). The playing experience of these players varied from 4 to 22 years. The sample consisted of forwards, midfielders, backs, and goalkeepers.

#### ***Measures***

Participants completed the Emotional Intelligence Scale (EIS: Schutte et al., 1998) and the Psychological Skills Inventory (PSI: Wheaton, 1998). They also self-reported their demographic information such as their age, playing position, and years of competitive playing experience.

#### *The Emotional Intelligence Scale*

The EIS consists of 33 items to measure four dimensions: (i) perception of emotion, (ii) managing own emotions, (iii) managing others' emotions, and (iv) utilisation of emotions. Sample items by dimension include "I find it hard to understand non-verbal messages of other people" (perception of emotions); "When I experience a positive emotion, I know how to make it last" (managing emotions); "Other people find it easy to confide in me" (managing other's emotions); and "When I am in a positive mood, solving problems is easy for me" (utilisation of emotions). Items are rated on a 5-point Likert scale ranging from 1 = strongly agree, to 5 = strongly disagree. Reverse scoring applies to items 5, 28, and 33. After reverse scoring, the items are summated to determine a total EI score. Schutte and colleagues (1998) reported an overall Cronbach's alpha of 0.90 for the 33-item scale while the mean alpha across samples was 0.87. In the present study, the Cronbach's alpha values of the EI scale's four dimensions revealed adequate reliability (ranging from 0.64 to 0.75), except for the 'utilisation of emotions' dimension that revealed low to moderate reliability (0.58). Although a value of >0.5 is still considered acceptable (Hinton et al., 2014), caution should be taken in the interpretation of results pertaining players' utilisation of emotions.

#### *The Psychological Skills Inventory*

The PSI comprises 60 items to measure six psychological skill dimensions: (i) achievement motivation, (ii) goal setting, (iii) anxiety control, (iv) maintaining confidence, (v) concentration, and (vi) mental rehearsal. Each skill consists of ten items that are measured on a 5-point Likert scale ranging from 0 = never, to 4 = always. Reverse scoring applies to questions 3, 9, 10, 13, 17, 18, 22, 23, 29, 34, 35, 39, 40, 46, 47, 51, 52, 57, and 59. Sample items include "I can persevere at my sport, even when I am very tired" (achievement motivation); "I set realistic, but challenging goals for my sport" (goal setting); "If I lose confidence during

a competition I know how to recover it” (maintaining confidence); and “During a competition I continue to concentrate well even after making a mistake” (concentration). Good test-retest reliability was reported for the PSI (Wheaton, 1998). In the present study, alpha values for the various sub-scales ranged between 0.75 to 0.88.

### *Procedure*

Approval for the research was granted by the Health Research Ethics Committee (HREC) of North-West University (Ethical number: NWU-00069-18-S1). The players voluntarily and individually provided informed consent. We informed the players about the study aims and procedures. In addition, we explained the potential risks and associated benefits of participation where after the players completed the surveys in a single sitting that lasted between 15 to 20 minutes.

### *Statistical analysis*

We analysed the data utilising IBM’s Statistical Data Processing Package (SPSS) for Windows (Version 26). After screening the data for any irregularities (missing values, outliers, and normality), the relationship between variables was investigated by applying Pearson’s product moment correlation coefficient. To predict psychological skills from EI, we conducted a simple linear regression with total EI entered as the predictor variable (independent) and the psychological skill subscales as the dependent variables. Prior to performing the latter analysis, tests were carried out to ensure no violation of the assumptions of linearity, collinearity, and homoscedasticity. We report effect sizes following the guidelines by Pallant (2007): 0.1 = small; 0.3 = medium; and 0.5 = large.

## **Results**

Table 1 presents the descriptive information for the variables. For EI, the players scored the highest in the perception of emotion subscale ( $M = 36.63$ ,  $SD = 4.97$ ), followed by management of own emotions ( $M = 36.20$ ,  $SD = 3.42$ ), management of others’ emotions ( $M = 30.75$ ,  $SD = 4.35$ ), and utilisation of emotions ( $M$



= 24.50, SD = 2.76). Achievement motivation was the highest reported among players' psychological skills ( $M = 80.58$ ,  $SD = 9.81$ ), followed by goal setting ( $M = 71.63$ ,  $SD = 17.20$ ), and anxiety control ( $M = 62.33$ ,  $SD = 10.95$ ). The maintenance of confidence ( $M = 57.63$ ,  $SD = 17.47$ ) and the application of mental rehearsal ( $M = 57.38$ ,  $SD = 17.47$ ) were similarly scored, with the ability to concentrate recording the lowest score ( $M = 54.13$ ,  $SD = 13.91$ ).

<insert Table 1 here>

Table 2 presents the Pearson's product-moment correlation coefficient analyses of the data. A medium and significant positive correlation between the perception of emotion and concentration ( $r = 0.35$ ,  $p = 0.01$ ) subscales was observed. Similarly, medium and significant positive correlations were noted between managing one's own emotions and the achievement motivation ( $r = 0.39$ ,  $p < 0.01$ ), maintaining confidence ( $r = 0.29$ ,  $p = 0.03$ ), and concentration ( $r = 0.37$ ,  $p < 0.01$ ) subscales of the PSI. Managing one's own emotions also correlated significantly with the players' total PSI ( $r = 0.33$ ,  $p = 0.01$ ) scores. Additionally, we observed a significant positive correlation between managing others' emotions and goal setting ( $r = 0.26$ ,  $p = 0.05$ ), as well as between utilisation of emotions and mental rehearsal ( $r = 0.30$ ,  $p = 0.02$ ). Furthermore, total EI scores proved to be significantly and positively associated with mental rehearsal ( $r = 0.33$ ,  $p = 0.01$ ) and total PSI ( $r = 0.34$ ,  $p = 0.01$ ) with a medium effect size.

<insert Table 2 here>

As indicated in Table 3, EI accounted for 11% of the variance in total psychological skills score [ $F(1, 58) = 7.39$ ,  $p < 0.05$ ] and emerged to be a significant predictor of players' overall psychological skills ( $B = 0.26$ ,  $p < 0.01$ ). The series of linear regressions also revealed that EI is a significant predictor [ $F(1, 58) = 6.98$ ,  $p$

< 0.05] of players' use of mental rehearsal ( $B = 0.52, p < 0.05$ ). Although not significant, EI exerted a moderate influence on players' approximations of goal setting and concentration ability accounting for 5% and 6% of the variance in these skills, respectively.

<insert Table 3 here>

## Discussion

This study sought to examine the relationship between EI and psychological skills application among female field-hockey players. The players' perceptions of emotion and managing one's own emotions strongly associated with their concentration ability. Our finding is consistent with that by Bahrololoum and colleagues (2012) who concluded that when athletes recognise and manage their own emotions, the proficiency to organise thoughts and focus on the task at hand automatically improves. Accurate awareness of oneself could enable athletes to eliminate negative emotions and capitalise on thoughts that translate or promote adequate focus on task-relevant cues (Karageorghis & Terry, 2011).

The importance of managing emotions effectively during sport participation has been underscored in earlier investigations (Mowlaie et al., 2011; Pedditzi & Spigno, 2019) and corroborates the positive correlation found between the players' ability to manage their emotions and their levels of achievement motivation, confidence, and total psychological skills scores. Relevant to our findings, Tod and colleagues (2011) observed that athletes who engender positive views about their situation and abilities are more likely to be successful in their sport. This finding may be explained by the fact that psychological strategies would enhance emotional control in athletes (Jones, 2003). Hence, players that display the ability to control and facilitate their own emotions would perform better from application of psychological skills during games. We also observed a significant interaction between management of others' emotions and the players' ability to set effective goals. Evidence supporting our finding indicates that engaging in team

goal setting is an effective tool to harness a connection and inspire mutual feelings among team members (Senecal et al., 2008). Additionally, utilisation of emotions and total EI predicted players' mental rehearsal ability. This finding lends support to previous research that advocates the value emotional responses play when engaging in imagery training to effectively promote skill learning and self-efficacy (Holmes & Collins, 2001; Ramsey et al., 2010). Together, these findings imply that athletes who are adequate in the utilisation of emotions will be more skilled in using mental rehearsal to create mental strategies when dealing with future scenarios.

Lastly, we observed the players' total EI scores significantly predicted their overall psychological skills scores. This finding is consistent with that by Bahrololoum and colleagues (2012), as well as Lane and colleagues (2009) who reported a higher level of EI in relation to the utilisation of psychological skills in sports. This may be explained by the fact that emotionally intelligent athletes are attuned to fleeting thoughts and emotions associated with task performance that demand high self-regulation (Lane et al., 2009). Therefore, it could be that field-hockey players with higher levels of emotional intelligence are more likely to effectively apply psychological skills in training and competition.

### **Implications for research and practice**

This study provides preliminary evidence regarding the potential role EI plays in the approximation of psychological skills application among female field-hockey players. This preliminary evidence suggests that sport psychology practitioners may consider EI interventions as an additional resource to enhance psychological skills application by athletes, thereby optimising their participation and performance. Coaches may also consider including EI as a potential pre-season screening tool to identify player profiles that could be used as charter for guiding athlete-centred training and development goals.

### **Limitations of the study and suggestions for further research**

Despite the encouraging findings, our study is limited by a small sample size. This limits the generalisability of findings. Moreover, we only sampled female field-hockey players and findings may not be true of male

hockey players without further study. Future studies should sample both male and female hockey players and employ larger sample sizes, seeking to replicate the findings from this exploratory study. We did not analyse by playing positions due to the small sample size. Further, we did not analyse the data by age and the level of expertise of players. This was a cross-sectional study and findings may be different with a longitudinal study design. Therefore, we recommend that future research should include evaluations at different times of the season (e.g. pre- or mid-season, end-of-season) to account for any seasonal influences.

### **Conclusion**

The present results suggest that EI influences psychological skills application in high level field-hockey participation. The psychological skills of achievement motivation, concentration, maintaining confidence, goal setting, and mental rehearsal may be modifiable with EI training. Based on this preliminary evidence, athletes and coaches may consider EI interventions as a resource for enhancing psychological skills application among female field-hockey players.

### **Authors' note**

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**Table 1.** Cronbach's alpha and descriptive statistics of female field-hockey players ( $n = 60$ )

Subscales	Min	Max	<i>M</i>	<i>SD</i>	$\alpha$
Age	17.00	29.00	21.57	3.65	
Emotional Intelligence Scale (EIS)					
Perception of emotion	24.00	47.00	36.63	4.97	0.75
Managing own emotions	28.00	44.00	36.20	3.42	0.64
Managing other's emotions	17.00	40.00	30.75	4.35	0.71
Utilisation of emotions	19.00	30.00	24.50	2.76	0.58
Total Emotional Intelligence score	105.00	157.00	128.08	11.02	0.67
Psychological skills inventory (PSI)					
Achievement motivation	57.50	100.00	80.58	9.81	0.80
Goal setting	27.50	100.00	71.63	17.20	0.80
Anxiety control	35.00	82.50	62.33	10.95	0.81
Maintaining confidence	32.50	75.00	57.63	17.47	0.81
Concentration	30.00	87.50	54.13	13.91	0.80
Mental rehearsal	5.00	92.50	57.38	17.47	0.88
Total Psychological Skills score	43.75	87.92	63.94	8.35	0.75

Min = minimum; Max = maximum; *M* = mean; *SD* = standard deviation;  $\alpha$  = Cronbach's alpha

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**Table 2.** *Pearson product-moment correlations between emotional intelligence and psychological skill subscales*

Emotional Intelligence subscales		Psychological Skills						Total PSI
		Achievement motivation	Goal setting	Anxiety control	Maintaining confidence	Concentration	Mental rehearsal	
Perception of emotion	Coefficient	0.05	0.11	0.09	-0.04	0.35 <sup>##</sup>	0.22	0.23
	Sig. (2-tailed)	0.72	0.41	0.51	0.76	0.01	0.09	0.08
Managing own emotions	Coefficient	0.39 <sup>##</sup>	0.08	0.04	0.29 <sup>#</sup>	0.37 <sup>##</sup>	0.18	0.33 <sup>##</sup>
	Sig. (2-tailed)	<0 .01	0.53	0.75	0.03	<0 .01	0.16	0.01
Managing others' emotions	Coefficient	0.06	0.26 <sup>#</sup>	0.23	-0.19	0.06	0.24	0.22
	Sig. (2-tailed)	0.64	0.05	0.07	0.06	0.67	0.06	0.09
Utilisation of emotions	Coefficient	-0.03	0.22	0.24	-0.05	-0.18	0.30 <sup>##</sup>	0.17
	Sig. (2-tailed)	0.82	0.10	0.06	0.72	0.18	0.02	0.20
Total Emotional intelligence score	Coefficient	0.16	0.23	0.21	-0.02	0.25	0.33 <sup>##</sup>	0.34 <sup>##</sup>
	Sig. (2-tailed)	0.22	0.08	0.12	0.91	0.05	0.01	0.01

Note. \* $p \leq .05$ ; \*\* $p < .01$ ; # Small effect size; ## Medium effect size

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**Table 3.** Summary of simple linear regression analyses for the impact of emotional intelligence on psychological skills

Variable	R <sup>2</sup>	R	Std. error of B	$\beta$	Sig.
Achievement motivation	0.03	0.16	0.12	0.16	0.22
Goal setting	0.05	0.23	0.20	0.23	0.08
Anxiety control	0.04	0.21	0.13	0.21	0.17
Maintaining confidence	0.00	0.02	0.11	-0.02	0.91
Concentration	0.06	0.25	0.16	0.25	0.05
Mental rehearsal	0.11	0.33	0.20	0.33	0.01*
Total Psychological Skills Score	0.11	0.34	0.09	0.34	0.01**

\*Statistically significant at  $p < .05$ ; \*\*Statistically significant at  $p < .01$ ; B = Beta of unstandardized coefficients;  $\beta$  = Beta of standardized coefficients

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