Chapter 4

Mental skill levels of South African tertiary institutions male field hockey players in different playing positions

MENTAL SKILL LEVELS OF SOUTH AFRICAN TERTIARY INSTITUTIONS MALE FIELD HOCKEY PLAYERS IN DIFFERENT PLAYING POSITIONS

This article will be submitted for publication in the African Journal for Physical, Health Education, Recreation and Dance (AJPHERD). The article is included in accordance with the specific guidelines of the journal, attached as Appendix A (Guideline for authors).

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ABSTRACT

Previous research highlighted the importance of taking positional differences into consideration when developing a mental skills training (MST) programme, specifically for the sport, due to the different demands required in each playing position. The purpose of this study was to determine the possible positional differences in mental skill levels among 91 South Africa tertiary institution males field hockey players. The participants competed in the University Sport of South Africa (USSA) tournament and were divided into four playing positions (i.e. goalkeepers (n = 12), forwards (n = 24), midfielders (n = 25) and backs (n = 30)). The participants completed a standardized sport psychological questionnaire of the Ottawa Mental Skills Assessment Tool-3 (OMSAT-3) and the results were compared by means of effect sizes (expressed as Cohen's d-value). The results showed that 22 moderate and 13 large practically significant differences. Collectively, these results show that the goalkeepers had the lowest scores for seven of the 12 tested skills, whereas the midfielders outperformed the other positional groups in six of the 12 skills. From the results of the present study it can be concluded that positional demands should be taken into consideration when developing an MST program specific for field hockey players.

KEY WORDS: Mental skills training, Playing positions, Field hockey

INTRODUCTION

A number of research studies have revealed the importance of mental skills training (MST) on players in different playing positions (Kirkcaldy, 1982; Cox & Yoo, 1995; Sewell & Edmondson, 1996; Andrew, Grobbelaar & Potgieter, 2006). In this regard, Cox and Yoo (1995) suggested that in team sports, the requirements with regard to each playing position should be taken into consideration when developing and implementing MST as the players' mental skill levels in the different playing positions may differ from one another. These differences were highlighted by the findings of Kirkcaldy (1982) regarding soccer players, who found that the players in the.

Sewell and Edmondson (1996) also reported significant differences between midfielders and defenders in the sport of soccer regarding their self-confidence levels. Furthermore, the goalkeepers showed significantly higher levels of anxiety and the lowest self-confidence levels compared to the other field positions. Cox and Yoo (1995) reported that in American football players in the offensive positions has a significantly better ability to control their anxiety than the players in the defensive positions. In the sport of rugby union, Andrew *et al.* (2006) found that the hookers and half-backs outperformed the other playing positions in all the tested mental skills. From these findings, it is clear that positional differences do exist with regard to mental skill levels of players in various sports, and thus warrant investigation within the sport of field hockey.

The importance of MST was highlighted by Cox and Yoo (1995) who stated that it prepares the body and mind for optimal performance. MST can be defined as "organized and consistent practice of sport psychological skills for purposes of enhancing performance, increasing enjoyment and achieving greater self-satisfaction in sport" (Weinberg & Gould, 2007). Both coaches and players' opinions regarding the importance of MST in sport and the development of such programmes have increased (Hacker, 2000). MST programmes are therefore regarded as very effective tools for enhanced performance and perceptions in sport settings (Blakeslee & Goff, 2007).

A field hockey team consists of sixteen players (eleven players on the turf with a further five reserves), which is divided into four main positions each with its own specialized demands. It have been reported that the game places immense physical, emotional and mental demands on the players, making well developed physical, physiological, technical, tactical and psychological skills in the various positions of the utmost importance for achieving success in this sport (Elferink-Gemser, Visscher, Lemmink & Mulder, 2004 and Anders, 2008). With regard to the mental skill levels of field hockey players, Grove and Hanharan (1988) noted that hockey players' capacity to maintain self-confidence and their ability to use imagery tends to be very poor during the game. Furthermore, Maynard and Cotton (1993) observed high levels of pre-match anxiety in hockey players and suggested that by implementing specific coping strategies, the players' anxiety levels will decrease, which in turn will lead to enhanced performances.

These findings only focus on the overall mental skill levels of hockey players; thus the question remains whether positional differences do exist among male field hockey players.

Research studies which were focused particularly on differences in mental skill levels among players in different playing positional were mainly done on males. For instance; a study in soccer showed that players in the defense position showed higher levels of emotional stability than players in the attacking positions (Kirkcaldy). In another study on American football, Cox and Yoo (1995) found that players in the offense positional ability to control their anxiety are better than the players in the defense. From the literature the aspects of MST were discussed and outlined but there was no evidence could be found on the effect of MST implementation on hockey players by positions, of which such information is important for performance. The purpose of the present study therefore, is to determine whether the mental skill levels of South African tertiary institutions male field hockey players in different playing positions differ significantly from one another.

METHODS

Subjects

Fifteen male field hockey teams who participated in the University Sport of South Africa (USSA) tournament hosted by the North-West University's Hockey Academy in Potchefstroom during 2008 were requested to participate in the research project. For the purpose of this study data used was from the male players who completed all the questionnaires. A total of 91 players, whom are part of six out of the fifteen teams are the participants for this study. The study focused on the different playing positions, which is: Goalkeeping position, back position, midfield position and the forwards position.

Test procedures

Administration of testing

Ethical clearance was obtained from the North-West University Ethics Committee (05K13). Testing took place during the week of the tournament. The coaches and the managers of the different teams were informed about the study and were requested to participate. The players

completed and signed informed consent forms, after having been informed of the nature and purpose of the research project. The subjects were informed that their data would be treated confidentially and that it would only be used for the research project. The participants were free to withdraw their participation in the project at any stage. Thereafter the players completed the demographic, general information questionnaire and one sport psychological questionnaire.

Demographic and general information questionnaire

Demographic information (name, surname, date of birth, test date, age and race) and hockey-playing history (years of playing, playing position(s)) was gathered by means of a questionnaire originally developed by Van den Heever (2006:46-50).

Measuring instruments

The various sport psychological subscales were measured by means of the Ottawa Mental Skills Assessment Tool-3 (OMSAT-3) of Durand-Bush, Salmela & Green-Demers (2001). The OMSAT-3 measures a broad range of mental skill subscales grouped together to form three categories, namely foundation skills (goal-setting, self-confidence and commitment), psychosomatic skills (stress reaction, fear control, relaxation and activation) and cognitive skills (focusing, refocusing, imagery, mental practice and competition planning). Each athlete's response was given on a 7-point Likert type scale ranging from Strongly disagree [1] to Strongly agree [7]. The score is seen as a high value when it is 6 or 7, medium or moderate between 3 to 5 and low if it is 1 or 2. The second-order CFA assessment (comprising 12 items) of the OMSAT demonstrated it to be related to other similar inventories with a Cronbach's Alpha of 0.74, with the individual correlation ranging from 0.69 to 0.79.

Statistical procedures

The collected data was processed by the Mindeval Research Team, while SPSS for Window (Version 17.0) was used for the statistical analysis. Descriptive statistics (mean, minimum and maximum) and frequencies were calculated. Effect sizes (ES) were used to determine the practically significant differences between the various positional groups for each of the twelve psychological skills. ES was calculated by means of the formula described by Thomas, Nelson and Silverman (2005).

$$ES = (M_1 - M_2)/s$$

Here, M_1 = the mean value of the first positional group in the comparison, M_2 = the mean value of the second positional group in the comparison and s = the standard deviation. The pooled standard deviation (Sp) was used in which:

$$s_p = \sqrt{\frac{s_1^2(n_1-1) + s_2^2(n_2-1)}{n_1+n_2-2}}$$

Here, Sp = the pooled standard deviation, S_1^2 = the variance of the subjects in the first positional group, S_2^2 = the variance of the subjects in the second positional group, n_1 = the number of subjects in the first positional group, n_2 = the number of subjects in the second positional group. Effect sizes are expressed as Cohen's *d*-value and can be interpreted as follows: an ES of more or less 0.8 is large, an ES of more or less 0.5 is moderate, and an ES of more or less 0.2 is small (Thomas, Nelson & Silverman, 2005).

RESULTS

Tables 1 to 12 report the mean scores and standard deviations of the 12 psychological skill subscales for each of the four playing positions. The inter-positional comparisons are also reported, with the differences between the playing positions expressed as Cohen's *d*-value.

Table 1 shows that the goalkeepers (5.4 ± 1.07) and forwards (5.3 ± 1.35) respectively had moderate and small practically significant higher *Goal-setting* scores than the midfielders (4.9 ± 1.06) and backs (4.9 ± 1.23).

Table 1: Descriptive statistics and comparisons between the different positional groups for the Goal-setting subscale.

Mean ± S.D.	Positional grouping	Goalkeepers	Forwards	Midfielders	Backs
		Effect sizes (Cohen's d-value)			
5.4 ± 1.07	Goalkeepers (n = 12)		0.08	0.47°	0.42°
5.3 ± 1.35	Forwards (n = 24)			0.33°	0.31°
4.9 ± 1.06	Midfielders (n = 25)				0.00
4.9 ± 1.23	Backs (n = 30)				

° Moderate practical significance (*d* = more or less 0.5)

Table 2: Descriptive statistics and comparisons between the different positional groups for the Self-confidence subscale.

Mean ± S.D.	Positional grouping	Goalkeepers	Forwards	Midfielders	Backs
		Effect sizes (Cohen's d-value)			
4.9 ± 1.30	Goalkeepers (n = 12)		0.57°	0.71°°	0.78°°
5.6 ± 1.20	Forwards (n = 24)			0.09	0.00
5.7 ± 1.04	Midfielders (n = 25)				0.11
5.6 ± 0.69	Backs (n = 30)				

° Moderate practical significance (*d* = more or less 0.5)

°° Large practical significance (*d* = more or less 0.8)

From Table 2 it is clear that the goalkeepers (4.9 ± 1.30) showed practically significant lower *Self-confidence* scores than the forwards (5.6 ± 1.20), midfielders (5.7 ± 1.04) and backs (5.6 ± 0.69). The remaining other positions were not practical significant.

Table 3: Descriptive statistics and comparisons between the different positional groups for the Commitment subscale.

Mean ± S.D.	Positional grouping	Goalkeepers	Forwards	Midfielders	Backs
		Effect sizes (Cohen's d-value)			
5.0 ± 1.34	Goalkeepers (n = 12)		0.65°°	0.22	0.05
5.8 ± 1.08	Forwards (n = 24)			0.48°	0.64°
5.3 ± 1.04	Midfielders (n = 25)				0.18
5.1 ± 1.10	Backs (n = 30)				

° Moderate practical significance (*d* = more or less 0.5)

°° Large practical significance (*d* = more or less 0.8)

Table 3 shows that the forwards (5.8 ± 1.08) had practically significant higher *Commitment* levels than the goalkeepers (5.0 ± 1.34), midfielders (5.3 ± 1.04) and backs (5.1 ± 1.10).

Table 4: Descriptive statistics and comparisons between the different positional groups for the Stress control subscale.

Mean ± S.D.	Positional grouping	Goalkeepers	Forwards	Midfielders	Backs
		Effect sizes (Cohen's d-value)			
4.3 ± 1.28	Goalkeepers (n = 12)		0.17	0.40°	0.29
4.5 ± 1.56	Forwards (n = 24)			0.15	0.07
4.7 ± 1.05	Midfielders (n = 25)				0.09
4.6 ± 1.16	Backs (n = 30)				

° Moderate practical significance (*d* = more or less 0.5)

The goalkeepers (4.3 ± 1.28) showed moderate practically significant lower values for *Stress control* when compared to the players in the midfield (4.7 ± 1.05).

Table 5: Descriptive statistics and comparisons between the different positional groups for the Fear control subscale.

Mean ± S.D.	Positional grouping	Goalkeepers	Forwards	Midfielders	Backs
		Effect sizes (Cohen's d-value)			
4.7 ± 1.33	Goalkeepers (n = 12)		0.11	0.43°	0.09
4.6 ± 1.30	Forwards (n = 24)			0.08	0.28
4.5 ± 1.04	Midfielders (n = 25)				0.48°
4.9 ± 0.89	Backs (n = 30)				

° Moderate practical significance (*d* = more or less 0.5)

From table 5 it is clear that the midfielders (4.5 ± 1.04) had moderate practically significant lower *Fear control* values than the backs (4.9 ± 0.89) and goalkeepers (4.7 ± 1.33).

Table 6: Descriptive statistics and comparisons between the different positional groups for the Relaxation subscale.

Mean ± S.D.	Positional grouping	Goalkeepers	Forwards	Midfielders	Backs
		Effect sizes (Cohen's d-value)			
4.1 ± 0.79	Goalkeepers (n = 12)		0.65°°	0.53°	0.70°°
4.9 ± 1.43	Forwards (n = 24)			0.24	0.08
4.6 ± 1.06	Midfielders (n = 25)				0.18
4.8 ± 1.11	Backs (n = 30)				

° Moderate practical significance (*d* = more or less 0.5)

°° Large practical significance (*d* = more or less 0.8)

Table 6 presents the players' results regarding their *Relaxation* skills. The goalkeepers (4.1 ± 0.79) showed practically significant weaker scores in *Relaxation* than the three remaining positional groups (i.e., forwards (4.9 ± 1.43), midfielders (4.6 ± 1.06) and backs (4.8 ± 1.11)).

From Table 7 it is evident that the goalkeepers (4.4 ± 1.08) also had large practically significant weaker *Activation* scores than the players in the other playing positions (forwards (5.2 ± 1.17), midfielders (5.1 ± 1.04) and backs (5.0 ± 0.70).

Table 7: Descriptive statistics and comparisons between the different positional groups for the Activation subscale.

Mean ± S.D.	Positional grouping	Goalkeepers	Forwards	Midfielders	Backs
		Effect sizes (Cohen's d-value)			
4.4 ± 1.08	Goalkeepers (n = 12)		0.72°°	0.68°°	0.75°°
5.2 ± 1.17	Forwards (n = 24)			0.09	0.21
5.1 ± 1.04	Midfielders (n = 25)				0.11
5.0 ± 0.70	Backs (n = 30)				

° Moderate practical significance (*d* = more or less 0.5)

°° Large practical significance (*d* = more or less 0.8)

Table 8 shows that the goalkeepers (3.9 ± 1.00) had practical significantly weaker *Focusing* scores than the forwards (4.4 ± 1.54), midfielders (4.8 ± 1.05) and backs (4.5 ± 1.01). In addition, the midfielders had moderate practical significant better focusing scores than the forwards.

Table 8: Descriptive statistics and comparisons between the different positional groups for the Focusing subscale.

Mean ± S.D.	Positional grouping	Goalkeepers	Forwards	Midfielders	Backs
		Effect sizes (Cohen's d-value)			
3.9 ± 1.00	Goalkeepers (n = 12)		0.35°	0.85°°	0.58°
4.4 ± 1.54	Forwards (n = 24)			0.31°	0.08
4.8 ± 1.05	Midfielders (n = 25)				0.29
4.5 ± 1.01	Backs (n = 30)				

° Moderate practical significance (*d* = more or less 0.5)

°° Large practical significance (*d* = more or less 0.8)

Table 9: Descriptive statistics and comparisons between the different positional groups for the Refocusing subscale.

Mean ± S.D.	Positional grouping	Goalkeepers	Forwards	Midfielders	Backs
		Effect sizes (Cohen's d-value)			
3.2 ± 1.50	Goalkeepers (n = 12)		0.23	0.92°°	0.71°°
3.5 ± 1.26	Forwards (n = 24)			0.69°°	0.49°
4.3 ± 1.06	Midfielders (n = 25)				0.18
4.1 ± 1.20	Backs (n = 30)				

° Moderate practical significance (*d* = more or less 0.5)

°° Large practical significance (*d* = more or less 0.8)

Table 9 indicates that the midfielders (4.3 ± 1.06) and backs (4.5 ± 0.98) respectively had practical significant better *Refocusing* scores (*d*=0.08) than the goalkeepers (3.2 ± 1.50) and forwards (3.5 ± 1.26) and backs (4.1±1.20).

Table 10: Descriptive statistics and comparisons between the different positional groups for the Imagery subscale.

Mean ± S.D.	Positional grouping	Goalkeepers	Forwards	Midfielders	Backs
		Effect sizes (Cohen's d-value)			
5.0 ± 1.18	Goalkeepers (n = 12)		0.14	0.13	0.52°
5.2 ± 1.13	Forwards (n = 24)			0.28	0.35°
4.9 ± 1.05	Midfielders (n = 25)				0.39°
4.5 ± 0.98	Backs (n = 30)				

° Moderate practical significance (*d* = more or less 0.5)

From Table 10 it is clear that the backs (4.5 ± 0.98) showed moderate practically significant weaker *Imagery* scores than the goalkeepers (5.0 ± 1.18), forwards (5.2 ± 1.13) and midfielders (4.9 ± 1.05).

Table 11: Descriptive statistics and comparisons between the different positional groups for the Mental practice subscale.

Mean ± S.D.	Positional grouping	Goalkeepers	Forwards	Midfielders	Backs
		Effect sizes (Cohen's d-value)			
4.3 ± 1.00	Goalkeepers (n = 12)		0.24	0.03	0.12
4.6 ± 1.20	Forwards (n = 24)			0.27	0.35°
4.3 ± 1.06	Midfielders (n = 25)				0.09
4.2 ± 1.09	Backs (n = 30)				

° Moderate practical significance (*d* = more or less 0.5)

Table 11 shows that the forwards (4.6 ± 1.20) showed moderate practically significant higher *Mental practice* values than the backs (4.2 ± 1.09).

Table 12: Descriptive statistics and comparisons between the different positional groups for the Competition planning subscale.

Mean ± S.D.	Positional grouping	Goalkeepers	Forwards	Midfielders	Backs
		Effect sizes (Cohen's d-value)			
5.0 ± 1.10	Goalkeepers (n = 12)		0.12	0.52°	0.67°°
4.8 ± 1.44	Forwards (n = 24)			0.32°	0.51°
4.4 ± 1.06	Midfielders (n = 25)				0.25
4.1 ± 1.34	Backs (n = 30)				

° Moderate practical significance (*d* = more or less 0.5)

°° Large practical significance (*d* = more or less 0.8)

Table 12 shows that the backs (4.1 ± 1.34) scored weaker practically significant values for *Competition planning* than the goalkeepers (5.0 ± 1.10) and weaker moderate practically significant values than the forwards (4.8 ± 1.44). The midfielders (4.4 ± 1.06) also showed moderate practically significant lower values than the goalkeepers (5.0 ± 1.10) and forwards (4.8 ± 1.44).

DISCUSSION

The results show that the goalkeepers compared to the other positions scored the lowest values in seven of the 12 tested psychological subscales (Self-confidence, Commitment, Stress control, Relaxation, Activation, Focusing and Refocusing). These poor results may be related to the fact that goalkeepers are the last players who can prevent the opponents from scoring goals and is the only position in which the use of any part of the body legally allowed to prevent an opponent to score a goal (Anders, 2008). Goalkeepers subsequently have a huge influence on the outcome of the game and experience increased anxiety levels as a result of being the last line of defense. In

fact, Maynard and Cotton (1993) stated that due to the strenuous demands of field hockey, the players generally experience high levels of pre-match anxiety, with the goalkeepers experiencing the highest anxiety levels of players in all the positions. Furthermore, their results showed that field hockey goalkeepers had the lowest levels of self-confidence when compared to the other playing positions. The current results (and that of Maynard and Cotton's research) are also in line with those of Sewell and Edmondson (1996) who reported that soccer goalkeepers had the highest anxiety levels and lowest self-confidence levels compared to the players in the remaining positions.

A plausible reason for the observed Focus and Refocus shortcomings and the lack of Self-confidence among the players as compared to the goalkeepers is that they required to deliver short periods of high intensity work followed by periods of rest Andrew *et al.* (2006). They could therefore, face similar challenges experienced by wings and fullbacks in the game of rugby union. In this regard Andrew *et al.* (2006) found that such periods of inactivity gave players in these positions more time during matches to ponder over past mistakes. Goldberg (1997) calls this phenomenon "time-travelling", i.e. when the player is not focusing on the "here-and-now". Preoccupation about past events have been linked to a decreased ability to Focus and Refocus as well as to lowered Self-confidence levels, especially when there is an excessive concern with the outcome (result) instead of focussing on the process (Potgieter, 2006).

Another positional group that has a very strong influence on the match outcome is the forwards. The main responsibility of the players in this position is to score goals (Naik, 2010), which may contribute to their high Commitment levels observed in the present study. The results also show that the forwards outperformed the rest of the playing positions in Relaxation, Activation, Imagery and Mental practice. The results show that these players tend to struggle with the skill of refocusing their attention. Failure to score goals, should the opportunity present itself, may have severe consequences for the final match outcome. Similar to the possible "time-travelling" problems (Goldberg, 1997) experienced by goalkeepers, the forwards may also end up pondering over the missed opportunities, rather than refocusing on the task at hand. Because their main objective is to score goals (Naik, 2010), forwards might lose interest in the game if the game

plan demands a more defensive style of playing and may struggle to Refocus when the game plan changes to attacking.

The midfielders showed the highest scores for Self-confidence, Stress Control, Focusing and Refocusing and the lowest score for Fear control. According to Naik (2010), players in this position play an important supportive role, since they have to create opportunities for the forwards to score goals and fall back to support the backs when the team needs to defend. This may suggest that these players do not have time during the game to ponder over past mistakes and thus do not lose their focus easily. This is further highlighted by Collins and Williams (2008) who stated that these players should have extraordinary game attentiveness. The fact that players in the midfield position contribute to scoring goals and prevent the opposition from getting the ball into the goal box might contribute to high levels of Self-confidence, which is in line with the findings of Andrew, Grobbelaar and Potgieter (2007), namely that half-backs in rugby union (who are regarded as the play-makers) have high levels of self confidence.

The players in the back position scored the lowest values in the skills of Goal-setting, Imagery, Mental practice and Competition planning when compared to the other playing positions. The main role of these players is to prevent the opposing team from creating any scoring opportunities (Naik, 2010) and furthermore have to supply quality ball for the midfielders and forwards to create attacking opportunities (Collins & Williamson, 2008). The backs defend typically and react to the movement of the oppositional forwards and therefore tend to be more reactive than pro-active and do not make use of visual images. The nature of their play might contribute to the poor Imagery, Mental practice, Goal-setting and Competition planning scores.

It is important to note that the present study has some limitations: The results of this study cannot be generalized to all field hockey players due to the fact that the study was limited to tertiary institutions male field hockey players. In addition, the small number of participants might have affected the results, which warrants caution when interpreting the results. Despite these limitations, the study contributes to the existing knowledge regarding mental skills training in this sport.

CONCLUSION

From the present results it can be concluded that the observed differences in the mental skills levels between the different playing positions emphasise the fact that when developing an MST programme for hockey, the demands of the different playing positions should be taken into consideration.

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