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Relationship of Psychomotor characteristics and playing ability of hockey players

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Abstract

The purpose of the study is to find out the relationship between psychomotor and playing ability of hockey players (N=20) male University Hockey team players of LNIPE, Gwalior were selected as the subject of the study, age ranging between 18 to 25 years with a mean and SD 20.40 ± 1.47 . The data was obtained by testing sensomotor coordination (S2) - Time in Ideal range (TIR), Visual pursuit test (S2) - No of correct answers (NCA), Reaction test (S10)- Mean reaction time (MRT) and time movement anticipation (S3) - Motion Anticipation- (MA) for psychomotor abilities and Akhil Malhotra objective skill test (Angular passing & receiving test - (APRT); Dodging & goal shooting test - (DGST); & Rolling & passing test (RPT) for playing abilities. The psychomotor abilities were assessed with the Vienna Test System (VTS). The data was analyzed by using Pearson's Product Moment correlation. The overall performance of psychomotor abilities was correlated to the playing ability of Hockey players. The level of significance was set at 0.05 level. The criterion measures chosen for assessing the psychomotor abilities with the Vienna Test System (VTS) are: Sensomotor Coordination (SMK S2), Visual pursuit test (LVT S2), Reaction test (RT S10), Time/movement Anticipation (ZBA S3). After analyzing the data it was found that The correlation of Hockey playing ability (APRT) angular passing & receiving test & psychomotor ability (LVT), of sub factor (NCA) no of correct answers is significantly correlated whereas hockey playing ability is positively correlated with (RT,ZBA) reaction test & time movement anticipation. In psychomotor ability (SMK) & hockey playing ability negatively correlation is found. The correlation of Hockey playing ability (dodging and goal shooting test & Rolling & passing test) & sensomotor coordination, Visual Pursuit Test is negatively correlated & with Reaction test, Time Movement Anticipation is positively correlated.

Keywords: Psychomotor, Playing ability, Time in ideal range (SMK) –TIR, Mean reaction time (RT) – MRT, Motion anticipation (ZBA) –MA, Dodging, goal shooting, Rolling & passing

Introduction

"Psychomotor" development refers to changes in a child's cognitive, emotional, motor, and social capacities from the beginning of life throughout fetal and neonatal periods, infancy, childhood, and adolescence. It occurs in a variety of domains and a wide range of theories makes understanding children's development a challenging undertaking. Different models have tried to interpret the origins of human behavior, the pattern of developmental changes over time, and the individual and contextual factors that could direct child development. No single theory has been able to account for all aspects of child development, but each of them may contribute an important piece to the child development puzzle. Although theories sometimes disagree, much of their information is complementary rather than contradictory. The knowledge of child typical development and related theories and models is greatly useful for clinical practice, leading to recognition of developmental disorders and the ways in which they can be approached and treated. In this chapter, traditional and more modern concepts around functional development of psychomotor abilities are reported, firstly more in general and then specifically in the motor domain (Cioni and Sgandurra, 2013)^[4].

Although physical size is unrelated to success in field hockey, the field hockey, the successful players need to quickly and skilfully execute fundamental and use her intelligence and physical prowess, including proper body balance, core muscular strength, anaerobic endurance, flexibility, exceptional hand - eye coordination and ball-to-foot relationship and agile speedy movement (Elizabeth Anders, 2008).

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Since sport is so visible and influential, psychomotor abilities are receiving considerable attention with an increasing number of individuals wishing to be involved in their explorations. Psychomotor abilities are skills such as hand-eye coordination, balance, and reaction time that arise from a unity of cognitive and physical functions. All healthy people develop some psychomotor abilities during the course of early development, and many people choose to develop those abilities further for work, athletics, or other activities.

The Vienna test system is a leading computerized psychological assessment tool. VTS the highest possible level of objectivity and precision, including aspects that cannot be measured by traditional paper and pencil tests, the base administrative software: VTS's administration software has a clear user interface from which you can administer tests, score the result and manage clients' data. A wide range of useful function enables you, example, to create test batteries or administer tests. Input devices: specialized input devices allow accurate measurement of performance that cannot be obtained with a mouse or keyboard. These includes a response panel and joysticks, for measuring reaction time, reactive stress tolerance and sensory motor coordination, and a light pen and other auxiliary devices for use with specific tests.

Methodology



Fig 1: VTS machine

All test forms include a preceding instruction and practice phase. Motivation factor was considered while administer the test to create interest among the subject.

At the end of the administration of test, the proper explanation of the nature and the objective of the study was given to the hockey players who had a curiosity to know for their acknowledgement and invited to ask questions if they wished.

Statistical technique: Statistical analysis was done with SPSS (Statistical Package for the Social Sciences, 20.0, USA). Mean and standard deviation was calculated as a descriptive statistics and the data was analyzed by using Pearson's Product Moment correlation. The overall performance of psychomotor abilities was correlated to the playing ability of Hockey players. The level of significance was set at 0.05 level.

Results

The results of the Statistical technique used were descriptive statistics such as mean and standard deviation and to find out the relationship Pearson correlation was applied. The level of

The procedure of this study consist of selection of subjects, selection of variables, criterion measures, testing procedure and the statistical technique employed for analysis of data.

Selection of the Subject: For the purpose of study twenty male (20) University Hockey team players of LNIPE, Gwalior were selected as the subject of the study, age ranging between 18 to 23 years with a mean and SD (20.40 ± 1.47)

Procedure: For the purpose of the present study, the selected subjects [N = 20] (Hockey players) were assembled and the instructions was delivered by the researcher regarding procedure and administration of test. To identified the relationship of psychomotor playing ability of the subjects, the selected parameters i.e. Sensorimotor coordination (test form S2) by Baugher.

Visual pursuit test (LVT test form S2) by Bernd, Biehl Reaction test (test form S10) by G. Schuhfrie, Time movement anticipation (ZBA test form S3) by Herbert Bauer, Giselher Guttmann, Michael Trimmel, Michael Leodolter and Ulrich Leodolte were assessed on VTS machine. The hockey playing ability was tested by Akhil Malhotra objective Skill Test that was.

- One minute angular passing and receiving test.
- Dodging and goal shooting test.
- Rolling and passing test.

significance was set at 0.05. SPSS 20 was used.

Table 1: Descriptive result of Psychomotor Variables for Angular Passing & Receiving Test

Name of Variables	Mean	Std. Deviation	N
APRT	24.00	2.36	20
TIR	6.45	3.89	20
NCA	35.20	4.81	20
MRT	200.75	55.89	20
MA	37.65	16.20	20

Table 1 presents the mean and SD of angular passing and receiving test (APRT) i.e. 24.00 ± 2.36 . The mean and SD scores of the psychomotor variables of time in ideal range (TIR) in sensorimotor coordination, number of correct answers (NCA) in visual pursuit test, mean reaction time (MRT) in reaction time and motion anticipation (MA) in time movement anticipation is 6.45 ± 3.89 ; 35.20 ± 4.81 ; 200.75 ± 55.89 , and 37.65 ± 16.20 respectively.

Table 2: Pearson Correlation for Psychomotor Variables and Angular Passing and Receiving Skill Test

Name of Variables		APRT	TIR	NCA	MRT	MA
APRT	Pearson Correlation	1	-.046	.569*	.007	.109
	Sig. (2-tailed)		.848	.009	.977	.649
	N	20	20	20	20	20
TIR	Pearson Correlation		1	.202	.185	-.276
	Sig. (2-tailed)			.393	.435	.238
	N		20	20	20	20
NCA	Pearson Correlation			1	.069	.180
	Sig. (2-tailed)				.773	.447
	N			20	20	20
MRT	Pearson Correlation				1	.299
	Sig. (2-tailed)					.200
	N				20	20
MA	Pearson Correlation					1
	N					20

*Significant at 0.05level (2-tailed)

Table 2 shows the correlation of number of correct answers (NCA) in visual pursuit test and angular passing test has significant relationship as the p value of 0.009 < 0.05, so it is positively correlated.

Whereas the sub factors of mean reaction time (MRT) in reaction time, motion anticipation (MA) in time movement anticipation and angular Passing & receiving test (APRT) is

positively correlated but not significant as P value is 0.977 & 0.649 > 0.05 respectively.

Further angular passing & receiving test (APRT) is negatively correlated with time in ideal range (TIR) in sensorimotor coordination and not significant as the P value is 0.848 > 0.05.

Table 3: Descriptive result of Psychomotor Variables for Dodging & Goal Shooting Test

Name of Variables	Mean	Std. Deviation	N
DGST	11.85	2.94	20
TIR	6.45	3.89	20
NCA	35.20	4.81	20
MRT	200.75	55.89	20
MA	37.65	16.20	20

Table 3 presents the mean and SD of dodging & goal shooting test (DGST) i.e. 11.85±2.94. The mean and SD scores of the psychomotor variables of time in ideal range (TIR) in sensorimotor coordination, number of correct answers (NCA) in visual pursuit test, mean reaction time (MRT) in reaction time and motion anticipation (MA) in time movement anticipation is 6.45±3.89; 35.20±4.81; 200.75±55.89, and

37.65±16.20 respectively.

Table 4 given below showing the correlation of the sub factors of mean reaction time (MRT) in reaction time, motion anticipation (MA) in time movement anticipation and dodging & goal shooting test (DGST) is positively correlated but not significant as P value is 0.293 & 0.357 > 0.05 respectively.

Table 4: Pearson Correlation for Psychomotor Variables and Dodging and Shooting Skill Test

Name of Variables		DGST	TIR	NCA	MRT	TIR
DGST	Pearson Correlation	1	-.278	-.027	.247	.217
	Sig. (2-tailed)		.235	.908	.293	.357
	N	20	20	20	20	20
TIR	Pearson Correlation		1	.202	.185	-.276
	Sig. (2-tailed)			.393	.435	.238
	N		20	20	20	20
NCA	Pearson Correlation			1	.069	.180
	Sig. (2-tailed)				.773	.447
	N			20	20	20
MRT	Pearson Correlation				1	.299
	Sig. (2-tailed)					.200
	N				20	20
TIR	Pearson Correlation					1
	N					20

*Significant at 0.05 level (2-tailed).

Whereas dodging & goal shooting test (DGST) is negatively correlated with time in ideal range (TIR) in sensorimotor coordination & number of correct answers (NCA) in visual pursuit test and not significant as the P value is 0.235&0.908> 0.05 respectively.

Table 5 presents the mean and SD of rolling & passing test (RPT) is 8.75±1.83. The mean and SD scores of the

psychomotor variables of time in ideal range (TIR) in sensorimotor coordination, number of correct answers (NCA) in visual pursuit test, mean reaction time (MRT) in reaction time and motion anticipation (MA) in time movement anticipation is 6.45±3.89; 35.20±4.81; 200.75±55.89, and 37.65±16.20 respectively.

Table 5: Descriptive result of Psychomotor Variables for Rolling and Passing Skill test

Name of variables	Mean	Std. Deviation	N
RPT	8.75	1.83	20
TIR	6.45	3.89	20
NCA	35.20	4.81	20
MRT	200.75	55.89	20
MA	37.65	16.20	20

Table 6 shows the correlation of the sub factors of mean reaction time (MRT) in reaction time, motion anticipation (MA) in time movement anticipation and rolling & passing

test (RPT) that is positively correlated but not significant as P value is 0.158& 0.092 > 0.05 respectively.

Table 6: Pearson Correlation for Psychomotor Variables and Rolling & Passing Skill Test

Name of Variables		RPT	TIR	NCA	MRT	MA
RPT	Pearson Correlation	1	-.050	-.006	.328	.387
	Sig. (2-tailed)		.835	.980	.158	.092
	N	20	20	20	20	20
TIR	Pearson Correlation		1	.202	.185	-.276
	Sig. (2-tailed)			.393	.435	.238
	N		20	20	20	20
NCA	Pearson Correlation			1	.069	.180
	Sig. (2-tailed)				.773	.447
	N			20	20	20
MRT	Pearson Correlation				1	.299
	Sig. (2-tailed)					.200
	N				20	20
MA	Pearson Correlation					1
	N					20

*Significant at 0.05 level (2-tailed).

Whereas rolling & passing test (RPT) in table 6 also showed negatively correlated with time in ideal range (TIR) in sensorimotor coordination & number of correct answers (NCA) in visual pursuit test and not significant as the P value is 0.835 & 0.980 > 0.05 respectively.

Discussion of findings

As shown by the results, hockey playing ability of angular passing & receiving test (APRT) had significant relationship with visual pursuit test (LVT) no. of correct answers (NCA) and it might be because of the factor that is in every competitive sports like football, hockey, volleyball, basketball there is a demand of having good visual pursuit ability, precisely for hockey because of the smaller size of the ball and a large play field.

The visual pursuit test is used to measure the ability of concentration, ability to imagine, and perceiving things and team mates in advance or during the play. It is very important to keep the view on the crowd rather than concentrating on one things. Tolerance and the associated ability to react. The test requires the respondent to use his cognitive skills to distinguish different memories the relevant characteristics of stimulus configurations, response buttons and as assignment rules, and to select the relevant responses according to the assignment rules laid down in the instructions and/or learned in the course of the test and the similar conditions are also present in sports like hockey i.e. a player have to decide with

his/her own cognitive ability to distinguish between the team mate and the opponent. Sometimes, the player uses his hearing skill to pass the ball to his team mate while they ask for the ball; at the same time the player need to hear referees whistle sound when there is any fouls and misconduct inside the field of play. The player need to respond to various conditions like passing the ball, receiving the ball and dribbling etc, which takes place during a match with quick response.

There is a positive correlation in the hockey playing ability of angular passing & receiving test (APRT). When it comes to psychological ability of reaction time and time movement anticipation as they are the key factor which helps them to react and anticipate every move in different situation and anticipate the movement of the ball as well as other players related to both passing as well as receiving in the game. It also helps them to understand the next moves of the opponents.

The results also says, hockey playing ability of angular passing & receiving (APRT)) had no significant relationship with sensomotor coordination and it might be because of the factor i.e.; in every competitive sports like hockey there is a demand of having good sensomotor coordination but here the result is negative. The present finding may be attributed to the reason that the subjects are not habitual to perform on computerized based test or they may be more interested in real match of Hockey. Other possible factors are the age group, timing of test etc.

The results of relationship among playing ability of dodging & goal shooting ; rolling & passing test & psychomotor ability of reaction test, and time movement anticipation is positively related but not significant. The psychomotor ability of reaction time and time movement anticipation are the key factors in the game of hockey. It is essential to react and anticipate every move in different situation and anticipate the movement of the ball as well as other players related to both passing as well as receiving in the game. It also helps them to understand the next moves of the opponents. It also help in perception part of the players which helps them in real game situation.

Conclusion

Within the limits and limitations of the study and on the basis of obtained results, the following conclusions have been drawn:

1. The correlation of Hockey playing ability (APRT) angular passing & receiving test & psychomotor ability (LVT) visual pursuit test, of sub factor (NCA) no. of correct answers is significantly correlated whereas hockey playing ability is positively correlated with (RT,ZBA) reaction test & time movement anticipation. In psychomotor ability (SMK) & hockey playing ability negatively correlation is found.
2. The correlation of Hockey playing ability (dodging and goal shooting test) & sensomotor coordination, Visual Pursuit Test is negatively correlated & with Reaction test, Time Movement Anticipation is positively correlated.
3. The correlation of Hockey playing ability (Rolling & passing test) & sensomotor coordination, Visual Pursuit Test is negatively correlated & with Reaction test, Time Movement anticipation, is positively correlated.

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