EVALUATION OF SELECTED ANTHROPOMETRIC AND PSYCHOMOTOR VARIABLES HIGHLY CORRELATED WITH THROWBALL PLAYING ABILITY OF NATIONAL LEVEL PLAYERS

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Abstract

The aim of this analysis was to evaluate the relationship between selected anthropometric and psychomotor variables with playing ability of throwball players. For that ninety national level throwball players were chosen. The throwball players who represented national level competitions were only selected. The throwball players who are in the age group of twenty two to twenty five years were only chosen. This investigation consists of one criterion, namely throwball playing ability, and eight determinant variables. To interpret the relationship between criterion and determinant variables were established by the method of co-efficient of correlation (Pearson product moment correlation). The multiple correlation were computed to make prediction for the performance in throwball playing ability with chosen determinant variables. The multiple regression equation was computed using step-wise method of multiple regressions, to find out the combined effects for the prediction of playing ability. To test the statistical outcomes 0.05 level of significance was fixed. The result proved that among the selected determinant variables body mass index was significantly correlated with the Throwball playing ability.

Keywords: *Anthropometric and Psychomotor variables and Throwball players*

INTRODUCTION

Players that are capable of winning medals at any stage are neither born nor made. Natural talent is no longer sufficient as a base upon which the carefully nurtured product is molded at any stage. Surprisingly, natural talent is easily recognized, but the "things" that goes into making up the talent is the most difficult to comprehend.

A variety of factors influencing sports performance have been identified based on an extensive review of sport literature and experience-based observation. Some of these variables were discovered to be intrinsic, while others were discovered to be extrinsic. Intrinsic factors were discovered to be internal, while extrinsic factors were discovered to be external. Internal factors are influenced by the player's "interest, will, skill, inherited or acquired attributes" as a result of genetics and climate, while external factors are influenced by the socio-cultural environment in which the player operates.

The object of the game of Throw ball is for one team to defeat their opponents by scoring more points than them in each set, each set being won by the first to 15 points. Win two sets and the game is won. Players in Throw ball attempt to defeat their opponents by throwing the ball into the opposition half, hoping that the other team will

fail to return it, scoring them a point. As a team game, players have to work in unison together and must have a good understanding of each other's game as well as having clear channels of communication. This ensures that there are no confusions over who is going for the ball, potentially giving their opposition a point.

A number of previous anthropometrical studies have shown that morphological features and body structure can influence the selection of athletes in a variety of sports. Cross-sectional anthropometric research have tended to indicate that some physical features, such as physique (somatotype) and body composition (body fat, muscle mass & body mass), have a direct effect on athletic results (Carter, 1984). Information of throw ball players' physical characteristics may provide insight into the individual factors that influence their success in the game. Anthropometric profiles are important for throw ball players because the sport involves physical contact, and certain physiques with a high degree of strength as well as power may have an advantage. Throw ballers' anthropometric features are taken into account when selecting players to carry out the game plan.

In competitive sports, perceptual skills combined with the ability to predict movement and share focus help to achieve success (Mańkowska et al., 2015). Since sports games take place in environments that differ in terms of a fast flow of information, space and time, anticipating opponent movement, focusing, anticipation and the capability to rapidly move across the court under the circumstances of a sports competition are all important aspects (Paul, Garg &, Sandhu, 2012). Therefore psychomotor qualities, together with reaction time can play a major role and direct to triumph (Yuksel & Tunc, 2018).

Previous studies have assessed how anthropometric and physical performance characteristics are important to achieve outstanding levels of performance in team sports such as basketball (Karalejic, Jakovljevic & Macura, 2011), soccer (Buchheit M, Mendez-Villanueva, 2013), rugby (Till et al., 2012) and throw ball (Mohamed et al., 2009; Ingebrigtsen, Jeffreys & Rodahl, 2013). According to these authors, anthropometric, and physical performance characteristics are considered fundamental for talent identification. The present study expanded on these ideas and tried to determine which anthropometric and psychomotor performance variables were most significant at the time of selecting national level throw ball players.

METHODOLOGY

Selection of Subjects

To investigator selected ninety national level throw ball players as subjects. The throw ball players who participated in the national level competitions were only selected as subjects. The throw ball players who are in the age group of twenty two to twenty five years were only chosen.

Selection of Variables

Criterion Variable: The subjective rating of the experts, who were designated to evaluate the handball playing ability of the selected subjects.

Anthropometric Measurements: The following anthropometric variables such as BMI, arm length, leg length, calf girth and thigh girth were chosen as determinant variables.

Psychomotor Qualities: The following psycho-motor abilities namely reaction time, balance and coordination were selected as determinant variables.

Collection of Data

The playing ability of the subjects was assessed by judges rating and the selected motor fitness and psychological variables were measured through standard test and measurements.

Statistical Techniques

In this study one criterion (throwball playing ability) and eight determinant variables were included. Pearson product moment correlation was utilized to verify the association between criterion (Throwball playing ability) and determinant variables. The relationship between criterion and determinant variables as well as inter-correlations among determinant variables was calculated by using Pearson product-moment correlation formula. To test the hypothesis 0.05 level of confidence was fixed.

Result

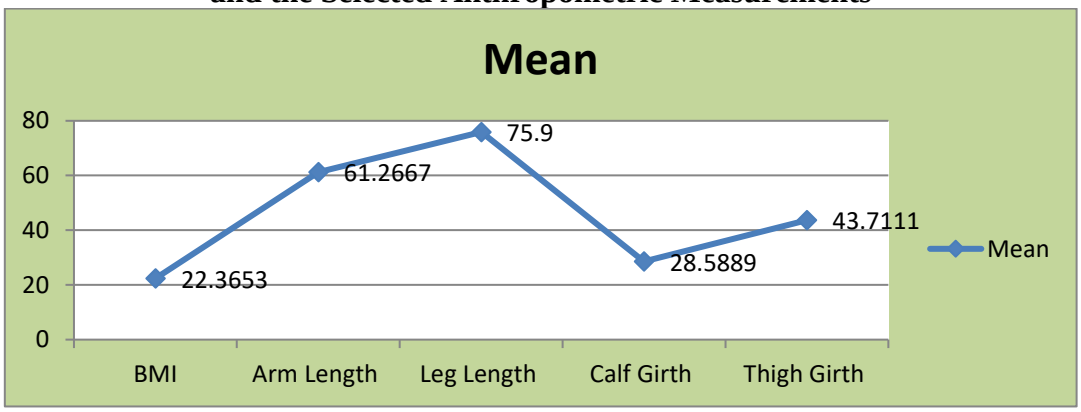
The mean and SD values on selected anthropometric variables were calculated as presented in table-1.

Table-1: **Descriptive Statistics on Throwball Playing Ability and Selected Anthropometric Measurements**

Variables	N	Range	Min.	Max.	Mean	Std. Error	Std. Deviation
BMI	90	11.40	15.20	26.60	22.3653	0.33768	3.20352
Arm Length	90	15.00	54.00	69.00	61.2667	0.44520	4.22353
Leg Length	90	10.00	70.00	80.00	75.9000	0.29053	2.75620
Calf Girth	90	5.00	26.00	31.00	28.5889	0.15634	1.48320
Thigh Girth	90	9.00	39.00	48.00	43.7111	0.27877	2.64467

The mean and standard deviation on throwball playing ability and the chosen anthropometric variables BMI, arm length, leg length, calf girth and thigh girth are 22.3653±3.20352, 61.2667±4.22353, 75.9000±2.7562, 28.5889±1.48320 and 43.7111±2.64467 respectively.

Figure – I: Diagram Showing the Mean Value on Throwball Playing Ability and the Selected Anthropometric Measurements



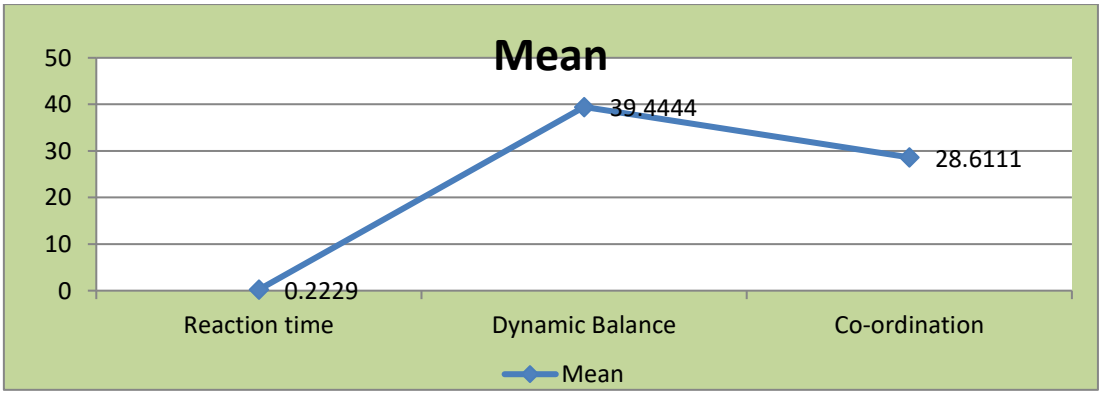
The summary of mean and SD values on selected psycho-motor variables were calculated as presented in table-2.

Table-2: Descriptive Statistics on Chosen Psycho-Motor Variables

Variables	N	Range	Min.	Max.	Mean	Std. Error	SD
Reaction time	90	0.10	.17	0.27	0.2229	.00288	0.02732
Dynamic Balance	90	7.00	36.00	43.00	39.4444	.19806	1.87899
Coordination	90	5.00	26.00	31.00	28.6111	.16322	1.54843

The mean and standard deviation on the selected psycho-motor abilities such as reaction time, balance and coordination are 0.2229±0.02732, 39.4444±1.87899 and 28.6111±1.54843 respectively.

Figure –I: Diagram Showing the Mean Value on Chosen Psycho-Motor Variables of Throwball Players



The inter-relationship between selected anthropometric and psychomotor characteristics and playing ability of throwball players was computed by using Pearson product moment correlation and the derived results are exposed in table-3.

Table-3: Pearson Product Moment Correlation Matrix Between and Within the Selected Variables and Playing Ability

	PA	BMI	AL	LL	CG	TG	RT	DB	CO
PA	1	-.873**	.025	-.124	.122	.078	-.123	.039	-.112
BMI		1	-.045	.084	-.120	-.082	.060	.004	.039
AL			1	.005	.007	.000	.007	-.017	-.018
LL				1	.155	-.070	-.054	.002	-.065
CG					1	.038	.093	-.168	-.090
TH						1	.037	-.130	.156
RT							1	.036	-.040
DB								1	.014
CO									1

Required table 'r' value of was 0.207 (0.05 level)

PA	Playing Ability	CG	Calf Girth	CO	Coordination
BMI	Body Mass Index	TH	Thigh Girth		
AL	Arm Length	RT	Reaction Time		
LL	Leg Length	DB	Dynamic Balance		

The result proved that among the selected determinant variables BMI (0.873) was significantly correlated with the Throwball playing ability, since these correlation values are greater.

Discussion

National level throwball players show better values in both anthropometric parameters and physical performance when compared to regional level players. These differences are highly significant in the case of anthropometric parameters (height, arm span, body mass, biacromial breadth, and hand length), even though other authors have also referred to these differences as key to performance levels (Mohamed et al., 2009; Gorostiaga et al., 2005). Mohamed et al., (2009) carried out a cross-sectional study with players (elite vs. non-elite) between the ages of 12 and 16, and concluded that maturation had influenced anthropometric parameters and not physical performance, except in the case of hand-grip. However, a study carried out by Matthys et al., (2011) with players between the ages of 12 to 17 and concluded that maturation was a determining factor in anthropometric and physical performance parameters.

Height contributes significantly in throwball playing ability. The taller Height players will have long stride to approval and run doming the game which player a

significant Ball is offensive and defensive game. Arm length and leg length has greater degree of contribution in playing ability of Throwball. The longer leg length helps to cover more distance is a shooting period and greater arm length gives positive contribution. Throwball players have greater thigh circumference of this because of greater thigh musculature which help in generating greater fore in long strong the shot execution.

Fong, Ng and Chung (2013) discovered that People who participated in this sport had a quicker response time than those who did not. It was also discovered that the degree of eye-hand coordination varied depending on the nature of the sport. According to Grigore et al., (2012) the level of eye-hand coordination in sports people/ players who keep in direct contact with an opponent (throwball, karate &basketball,) is much higher than in sports people/ players who engage in contactless sports (swimming, sprint, dance and gymnastics).

It was also discovered that the degree of eye-hand coordination varied depending on the nature of the sport. Kruger et al., (2014) research showed that the athletes who played on the wings and in the back position had the best jumping skill. During the study of the throwing velocity, a related phenomenon was observed. Throwball matches on the backs and wings had the best results.

Conclusion

The result proved that among the selected determinant variables BMI (0.873) was significantly correlated with the Throwball playing ability. Coaches, physical educators, and trainers may use these study outcomes to pick and test potential throwball players at the national level.

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