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Prediction of Playing Ability of Tamil Nadu Handball Players in Relation to their Motor Ability and Kinthropometric Variables of Handball Players

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Abstract--The purpose of the study is to find out the Prediction of playing ability of Tamil Nadu handball players in relation to their motor ability and kinthropometric Variables of handball players. Total 120 subjects are selected randomly from Tamil Nadu. In the modern world. The individual characteristics may include any think pertaining to the need of the game and in case of handball the motor ability and anthropometric variables have no place and match for higher a many the individual characteristics each individual or team which participate in any sports events wants to win because society attract great significance of winning. Handball being a running dribbled game and the game gained popularly and spread all over the world and having a various fundamental skills needs the factors which relate to the development of health and increase functional capacity of the body and its contributes in the successful performance of fundamentals skills in handball . This will also helpful in general develop means of handball players and the game of handball. The results of the study set a general trend of the improvements in overall handball playing ability according to their level of competitions

Keywords--Kinthropometric Variables, Fundamentals Skills, Motor Ability and Anthropometric Variables

I. INTRODUCTION

Handball is one of the most popular sports in the world in terms of spectator sports and players participation. It is one of the fastest games in the world involving continuous movement and actions. These ingredients make it challenging in many ways for the participant and a thrilling experience for the spectator. This game is usually played indoors and occasionally outdoors. It is played as an inter-school, inter-collegiate, inter- university and professional sport.

The game is contested between two teams. Each team comprises of twelve players, among them six players and a goal keeper play inside and remaining five players will be the substitutes. The game is played for 60 minutes with two halves of 30 minutes each. Each team has its own Goal at opposite ends of a court. The size of the court is 40metersx20 meters. In this game all the seven players make aggressive, concentrated and fast movement to meet the defensive and offensive situation of the game, E.g., quick start, quick passes, quick and accurate throw, abrupt changes of places, sudden changes of direction and vigorous jumps for shooting.

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Hand Ball

In 1928, Olympic committee gave its permission to play this game in Olympics for the first time in 1934. Twenty five countries were affiliated members of the International Hand Ball Federation. Now a days, more than 50 countries are playing this game. In present time, rules of this game are changing very fast. This game has become very fast. Now 7 players play in a team. Its ground is small and can also be played in door ground.

The formal shape of this game was given by Prof. Vactor Karas in 1905, who gave the formal rules of Handball which were similar to what were introduced by Prof. Hedger Neilson in 1896. In 1907, Neilson organized competitions and elaborated the rules of the game and he also recommended the formation of its Federation. The first international competition for men and women was held in 1925 and 1930 in Vienna & Austria respectively. As the game gained popularity and spread all over the country, girls also looked up with almost same enthusiasm and gusto as boys did. The pleasure and thrill that the gam provides have attracted the people of all classes to play Handball or witness the game all over the world.

The Handball has got various fundamental skills like player's stance and ball holding, passing, dribbling, shooting, rebounding, pivoting, screening and individual defense.

II. METHODOLOGY

In the present investigation 120 male hand ball players belonging Tamil Nadu were selected as subjects of the study. Which was planned to analyze the motor ability (Motor fitness) an thropometric variables (Physique) and the status of playing ability. The investigator has tried to find out the relationship among these variables and playing ability. In this study the playing ability is a dependent variables anthropometric measurements and motor fitness are the factors which effect the performance of hand ball players became the independent variables of the study and relationship among these variables with performance. The investigator has also tried to find out the combined effect of these variables on the playing ability of male hand ball players. The investigator has examined the playing ability of each players by the judges rating scale. After rating observation all the players appeared for following anthropometric measurements and motor ability test applied to collect data.

Selection of variables and test

After a thorough review of literature related to the game of Handball in books, journals, periodicals and research articles besides detailed discussion with the experts and keeping in view of the feasibility of the study in terms of availability of equipment and the relevance of the variables to the present study, the following variables were selected.

Anthropometric Variables

Age, Weight of body
Linear Measurements (Girth)
Upper arm, fore arm, thigh and calf circumferences
Bone Diameters
Elbow, wrist, knee, ankle

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Skinfold Measurements

Biceps, triceps, sub scapular, suprailic, thigh and calf skinfold.

Motor Fitness Components

Speed, strength, endurance, agility abdominal strength, explosive power.

To examine the combined effect, the investigators has visited 120 male hand ball players intofour groups according to their level of performance i.e. inter college, state inter varsity and national.Thegrouping was made after examine the performance level given on the prescribe perform ance and whichwas duly verified from the record of colleges, universities and district as well as state hand balla ssociation.

All the anthropometric measurement were taken to the left side of the individual on thestandard techniq ues described by each measurements by Weiner and Lauire (1969). All the measurementwere recorded to the ne arest of centimeter, milimeter and 1/10 of the seconds.

In addition to above instrument the following tests used to measure motor fitness :-

1. 100 yard dash run for measuring speed.
2. Bent knee sit ups for measure abdominal muscular strength.
3. Hold half push for meaning endurance.
4. Shuttle run for measuring agility.
5. Medicine ball put (5 pond) for measuring muscular strength.
6. Sergeant jump for measuring explosive power.

statistical design

The study has been divided in two parts and in these parts analyse. The relevant data the investigator has collected and has used the following techniques of statistical tools :

To interpret the relationship between anthropometric variable and motor fitness componentswere established f or method of co-efficient of correlation.

The multiple correlation were computed to make prediction for the performance in hand ballplaying ability with anthropometric measurement and motor fitness. The multiple regression equati onwere competitor using Wherry Doo little method to find out the combined effects for the prediction ofplaying ability.

To confirm the combined effect of two independent variables ones the dependent variables, thesubject w as divided into four groups and their data of anthropometric measurements, and motor abilitytest were compute

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d and applied. The technique of analysis of variance (Anova) were applied to knowthe combined effects on the h and ball players. The level of significance to check the relationship andcombined effect was set or 0.01 level. Which was considered appropriate for the purpose of this study because the present research process did not invoice highly statistical equipment's demanding the application of the move stringent level of significance.

Analysis and Interpretation of Data

The mass of data collected in accordance with the research methodology presented in earlier photographs, the findings of the study were obtained after analyzing and interpretation of data. The main objectives of this study were to examine the anthropometric variable and motor ability. For this the investigator has taken 120 hand ball players of Haryana and their playing ability were judged under the game situations and to find out the relationship of playing ability to anthropometric variables and motor ability component. The study was divided in to two sections. In section, the motor fitness components and performance in hand ball game multiple correlation and regression equation were computed to make prediction for the performance in handball, playing ability of male handball players of Haryana.

In the second section the investigator has to examine the combined effect of anthropometric variables and motor fitness components on playing ability of male handball players. The players were divided into the four groups on the basis of their previous performance as recorded by the investigator the mean, SD and analysis of variance (Anova) techniques to find out the combined effects on the performance of handball players. The analysis of data on 120 male handball players and their analysis, discussion of findings and testing of hypothesis are presented below:

Part-I

Playing ability of male handball players & different levels of performance. The present section 2 deals with analysis of data based on playing ability, anthropometric variables and motor fitness components of handball players male at four level of their participation i.e. inter college state, intervarsity and national level. The playing ability of each players was obtained through the panel of three judges on their rating scale doing game situations at the different places. The data collected were interpreted while applying the statistical tools viz mean scores and standard deviations placed in table 2.1.

Hand Ball playing ability of different groups

Table 1: Hand ball playing ability of different groups

Sr. No.	Groups	Mean	Standard Deviation
1	Inter college	2.10	1.54
2	State Level	2.70	1.68
3	Intervarsity	4.03	1.10
4	National Level	5.03	0.46

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Table 1 shows the mean score and S.D. value of each group. The table further reveals that level of performance also increased the playing ability. The mean scores and standard deviation indicate that homogeneity increase playing ability as increase the level of performance. The increasing level of performance also increase the playing ability of male handball players and also gives variations among the groups i.e. inter college, state, inter varsity and national respectively. Further to find out the significant difference among the groups the statistical treatment through analysis of variance (anova) was applied. The result of one way analysis are presented in table 1

***TABLE 2:** Anova of male handball players for hand ball playing ability*

Score of variance	**Df.**	**Sum of squares**	**Mean score of squares**	**F. ratio**
Between group	3	179.8	59.93	
Within group	116	220.4	1.84	31.54**

***Significant at 0.01 tabulated value 2.78.*

Table 2 high lights that there exists significant difference between the male handball players of different level in their playing ability the calculated f ratio 31.54 was found to be on the higher side of tabulated value 2.78 at 0.01 level of significant within the 3 and 116 degree of freedom.

It was clear from the result of handball playing ability that national level male hand ballplayers appeared to be significant between the inter college, state and intervarsity level male handball players. This indicates that the national level players have more experience of playing handball in the competitions these results may be denoted that the national level players are better in handball playing skills because of their experience and participation in the competitions.

***Table 3:** Anova of hand ball players of different levels of performance and anthropomeric measurements d.f. 3, between group and within group 116*

Sr. No.	**Variables**	**Sum of squares**	**Mean sum of square**	**F. fario**
1	Age	50.57 113.50	16.89 0.96	17.16**
2	Weight	690.05 770.74	230.02 6.64	34.65**
3	Height	1425.52 1464.25	475.18 11.06	122.58**
4	Arm Length	241.30 707.06	80.34 6.90	13.02**
5	Leg Length	154.69 568.79	51.23 7.94	6.58**

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6	Upper Arm Length circumference	411.73 21.75	137.12 18.95	7.73**
7	Forearm Circumference	182.30 225.04	60.67 1.39	31.84**
8	Thigh Circumference	42.61 1784.85	15.93	0.921 N.S.
9	Calf Circumference	61.61 373.48	20.38 3.22	6.23**
10	Elbow diameter	9.22 5.40	3.70 0.40	76.57**
11	Wrist Diameter	8.71 1.45	2.07 0.10	2.70**
12	Knee diameter	12.58 16.48	4.82 0.41	30.75**
13	Ankle Diameter	13.20 11.69	4.04 0.01	4.4**
14	Biceps Skinfold	72.31 24.88	24.40 0.21	114.74**
15	Triceps Skinfold	76.70 164.39	25.53 1.24	11.58**
16	Sub Scapular Skinfold	85.63 17.92	28.54 0.41	203.12
17	Superaillic skinfold	96.51 45.50	32.71 0.83	84.56**
18	Thigh Skinfold	103.22 12.81	34.04 0.10	3.44**
19	Calf Skinfold	92.97 39.59	30.39 0.43	90.79**

Data given in table 3 depict that there were significant difference in anthropometric variables amongs the different level of handball players as calculated f. value of most of variables were found higher than tabulated value 2.78 with 3 and 116 degree of freedom only thigh circumference at Sr. No. 9 are not found significant even at 0.05 or 0.01 level.

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Table 4: *Correlations of motor fitness components with playing ability of Hand Ball Players N =20*

Sr. No.	**Variables correlation with playing ability**	**Co-efficient of correlation (r)**
1	X_{20} Speed	265**
2	X_{21} Muscular Abdominal Strength	572**
3	X_{22} Endurance	453**
4	X_{23} Agility	514**
5	X_{24} Strength	140 N.S.
6	X_{25} Explosive ???	447**

N = 120, ***Significant at 1% r= 238 df. 118, *Significant at 5% 184.*

Table 4 indicates that speed muscular strength endurance, agility and expletive power have positive and significant correlations at 1% and 5% level of significant. The table also indicate that strength has no significant correlation with the performance of playing ability.

Table 5: *Multiple correlation and regression equation of selected Anthropometric variables and selected motor fitness components to playing ability of hand ball players*

Sr. No.	**Dependent variables**	**Selected independent variables**	**Regression coefficient**	**Multiple correlation**	**Determinant of multiple correlation**
	YC	**X**	**BX**	**R**	**R**
1		Height	0.007		
2		Body weight	0.099		
3		Leg length	0.030		
4		Upper arm circumference	0.101		

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5	Handball playing ability	Calf circum. Wrist diameter	0.092	06678	04456
6		Wrist diameter	1.427		
7		Muscular abdominal	0.786		
8		Exploitive power (leg)	0.064		

Beta coefficient 12.452, SE 1.33186

Table 5 shows clearly that multiple correlation R 0.675 of height, body weight, leg length, upper arm circumference wrist diameter, muscular abdominal strength and explosive power taken together with hand ball playing ability are significant at 1%. It also shows that the component effect of these variables taken together contribute to improve the playing ability of male hand ball players. The multiple correlation is a sufficient si?? Hence, these variables could be put into the regression prediction equation of the playing ability of hand ball players.

Table 5 further illustrates the multiple regression analyses performed to develop equation for the prediction of playing ability of players on the basis of X_2 X_3 X_5 X_6 X_9 X_{11} X_{21} and X_{25} anthropometric variables and motor fitness components. The resulted multiple regression equation in score from is:

$YC\ B_0 + B_1X_2 + B_2X_3 + B_3X_5 + B_4X_6 + B_5X_9 + B_6X_{11} + B_7X_{21} + B_8X_{25}$

Where

YC predicted playing ability

X_2 Body weight X_3 weight X_5 leg length X_6 upper arm circumference X_9 calf circumference X_{11} wrist diameter X_{21} muscular strength X_{25} explosive power more over the value of multiple coefficient of determinant R_2 = 0.4456 suggests that 44.56 of variance of playing ability of male handball players could be predicted on the basis of regression equation developed by these eight variables. The remaining variances of playing ability score 55.44% are due to other factors hence the developed regression equation could be put into the prediction of playing ability of handball players. Combined contribution of anthropometric variables and motor fitness components in handball playing ability.

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The findings of the study declare that the anthropometric variables and motor fitness components contribute significantly towards. The playing ability in handball. The multiple correlation C = 0.66747 of nineteen selected anthropometric variables and six motor.

Motor fitness of Hand Ball players at different levels of performance

For testing of motor fitness components, the Hand Ball Players subjects appeared in a few silted motor fitness components vir speed, strength, endured, Agility and explosive power for area of the stranded test terms to measure the performance in each of the components. The investigator has made all possible efforts to find out the difference is selected variables among all the for level of performance of Hand Ball players on measurability by competing once way analysis where the different found significant.

***Table 6:** Anova of Hand Ball for different levels of performance and motor fitness components*

Sr. No.	**Variable of variance**	**Source of square**	**Df.**	**Sam of squares**	**Men squares**	**F. ratio**
1	100 mt ba sh speed	Between granges	3 116	730 2462	2.40 0.19	11.14**
2	Bent ness sq. upt strength	do	do	2860.37 1278.30	953.09 11.21	82.17**
3	Endurance Hold half push	do	do	1160.16 370.303	368.50 11.11	34.71**
4	Agility	do	do	420.19 239.31	134.40 1.09	64.02**
5	5 found Me dicine Ball past exclusi ve power	do	do	21192.28 43452.17	7063.26 374.55	18.65**
6	Vertical jump	do	do	8580.09 103.35.30	28.92.78 8.96	31.15

Table 6 indicate that motor fitness the national and intervenes level players are farad better in their motor fitness as compared with state and Inter College Level Hand Ball Players as calculated F. ratio in all the variables were

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formed Higher that the Tabulated value 2.78 with degree freedom 3 and 116 significant at 0.01 level.

III. CONCLUSION

The basis of main findings with in the limiting scope of the study the following conclusion were drawn and appeared to be justified as per result obtained.

1. In anthropomeric measurement the results of the study indicate that higher level of handball players appear to be older in age, taller in height, having better and leg length, body weight, diameters, circumference and skin folds etc. The national and intervarsity level groups were found significantly better statistically in all the selected anthropometric measurement than the lower groups of hand ball players.
2. On the basis of results. It is found that general trend of the improvement in overall handball playing ability of the male player from inter college to state, state to inter varsity and national belonging to Haryana State and its Universities. The gradual increase shows that player have a better playing ability according to the higher level of competition.
3. The results also reveals that higher level male hand ball players belonging to national and intervarsity had motor fitness parameter like speed muscular strength, endeavour, agility & flexibility strength and explosive power in total motor fitness than the power level groups.

The national level hand ball players appear to have more experienced and having a better playing ability and fundamental skill them other three groups.

Any different selected independent parameter, the anthropometric measurements and ability component appears to be more contributing factors in order for priority for better handball players.

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