

SELECTED KINTHROPOMETRIC CHARACTERISTICS WITH ACCURACY PERFORMANCE OF HANDBALL PLAYERS

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ABSTRACT

The purpose of the study was to determine the characteristics of kinthropometric and their relation with handball skills .accuracy and also to know how accuracy can be developed among the university level handball players A handball players like other sports also requires of right type of physique and mental make up the player of handball must be good tall and having average height from 5.8' to 6' . In the light of fast growing realization of the imaginations of handball game and its contribution to wellbeing and fitness of human in general the study will helpful to know required and immediate . Kinthropometry variables or traits related for the development of fundamental skill like accuracy . It is in the height of spirits to take up the study . Concering relation with playing ability and kinthropometry variables and accuracy . It is very clear from the results their these measurements have significant contribution to the accuracy performance of players of handball.

KEYWORDS:

INTRODUCTION

The participating competitors in sports at international level bring name, fame and Laurals for their country and also raise their prestige. Now winning the competitions involves the national prestige as each nation strive to win a tournament in which to project the superiority of their political ideology and socio political system through spectacular achievements in the field of sports. They show their excellence by winning the maximum numbers of medals in all the international competitions.In modern days, preparation of a sportsman for competition is carried out through joint efforts between the sports scientists, the practitioner and coach. It is recognised by present day. Coaches that supervisory method of preparing athletes for competition is one which is based on proven scientific principles rather than on trail and error or on empirical judgment. Performance, improvement in most events of games and sports including hand ball observed in recent year is credited to the merger of talents of coaches and scientists. Sports competition in present scenario is forcing performance level of sports men next to higher only which is coming days will be more upward side rather than down word. Therefore it requires highly scientific approach to achieve high level of performance is coming days.

There is no doubt that our sports federations are putting efforts in improving the standards of sports in India, but this has not yielded fruitful result. The media also tries to get attention of millions of viewers and readers in advocating the plight of Indian sports. This has prompted the sports bodies to look for new ways and means to achieve better result. Even in the threshold of modern century we are still using the conventional methods of developing the sports. At present there are very few exports of sports in India, who can lead sportsmen to a decent level of performance. We continue to use useless methods without the backup of scientific techniques, which can, on sure basis, give desired results. India is known for slow and spin bowlers but with the help of scientific physio techniques, physio-experts and professional coach. It was able to give awesome bowling attack in the world cup with the same thin and weak bodies like. Ashish Nehra and Srinath if this can be achieved in cricket, why not in Hockey, Volleyball, Handball, Basketball and other games. Therefore high levels of performance can be achieved with the combined efforts of sports persons, coaches scientists. Doctor's and psychologists etc. Desired results can only be achieved through integrated efforts of leading people of various fields. Who can give valuable inputs for desired performance. In 1926, it is picture was found in Athens town hall, first it was started by Germany's gymnastic coach Connor Cotta. But this game was not popular immediately. After second world war two persons of Germany Dr. Sthlenz and Hirsthman played very important role to make this game very popular. In the beginning it was played by the rules of football. The off side rule of football applied in the game. The international handball, federation was established in 1928 at Amsterdam (11) eleven countries were became the members of this federation and Mr. Brundez was elected its president. The Olympic gave its permission to play the game in Olympic in 1934, 25 countries were affiliated as members of the international handball, federation. At present more than 50 countries are playing this game and the rules of the games are changing very fast. Now 7 players play for the team, its ground is small can also be played in indoor ground. It is a running oriented game. Which has made the game very fast handball come to India in the year 1971. The first national eleven a side handball championship men was held at Rohtak. In 1976 seven a side handball started in India, India toured China in 1979 and Germany in 1982 and participated in Asian games in 1982. At present India is an up coming country in handball and had been participating regularly in international competitions. India handball federation has been organizing national level competition both for men & women, junior and seniors, handball is a game which demands high standard of physical fitness and mastering of techniques and excellent co-ordination. The pleasure and thrill that the game provides have attracted the people of all classes to play handball or witness the game allover the world. The handball has got various fundamental skills like players stance, ball holding, passing dribbling shooting rebounding pivoting, screening and individual defence and accuracy.

KINANTHROPOMETRIC

Its constitutes the earliest form of measurement in physical education as one might surmise as study of the human physique and its proportions began many centuries age. The early beginning can be traced from the remote civilization of India, where a treatise called 'Silpi Sastri' analyzed the out line of the body by dividing it info 480 parts. So kinanthropometry evolved in the quest to determine the ideal body proportions, artists and sculptors directed their study to it as shown by the artwork in

early civilizations. These measurements are for the assessment of physical status was expanded quite naturally to include consideration of body types and the relation of physique to one's health, immunity from disease, postures, physical performance and personality qualities. Hippocrates first realized and classified human being according to two basic physique long and thin or short and thick. Kretshmer the father of modern body or somatotype defined. Three types by adding an in between and referred to them as aesthetic (lean) athletic and Pyknic (Heavy). Presently kinanthropometry considers individuals differences appraises each subject to relative to this structural differences and determines has potentialities in light of these structural characteristics measurement of the body which include in size weight limb length, width and circumference. These specific measurements of the segments reveal the relationship between kinanthropometry and performance. These body segments helps the top athletes perform in aid require for the particular performance. Accordingly, the body segments have a significant place in the field of sports activities and in the field of sports activities and incorrect body proposition may lead to bad performance. The physical fitness parameters such as speed, agility flexibility, stamina and endurance help a sports person to make size and shape of the body to perform high skills of the game. The parameters accommodate the physical proportions and physiological efficiencies. A Hand ball players like other sports person also requires of right type of physique and mental make up. The players of hand ball should have ecto-mesomorphic characteristics of the physique. Which can give the advantages to player for making shooting of the ball to the opponent goal post. Which have approximately 1½ mtr. height of the net. One of the mesomorphic characteristics is the height of the hand ball players. Which should be 5.10" to 6' with weight between 65 to 75 kg. along with the body strength, which dominate any kind of sports and executions of the skills. Human performance is a combination of many variables one of them is the structure of the body. All of the above factors that are age related, what is perfect form for less tall well built, motivated and dedicated players may prove inadequate as they mature into adulthood. As younger players, mature coaches may need to consider and introduce a lightly different techniques which take these changes into account. All in all can be said that in the light of the fast growing realization of the importance of Hand ball game and its contribution to the well being and fitness of human in general. Performance in total sports and further development of participants, especially kinanthropometry and its traits related to hand ball game. It is in the right of the spirit to take up the study concerning relation with playing ability and kinanthropometry variables and accuracy.

ACCURACY

Accuracy has to do with the ability to control one's more movement in relation to a specific target or object. Many physical education activities involving precision of movement for throwing, hitting, shooting, kicking and the like and dependent for success on this factor. Accuracy is no doubt interrelated with other factors such as co-ordination, balance, kinanesthetics and visual perception but it is sufficiently different to make it an entity in it self.

METHODOLOGY

The present study is a survey type study in which the survey were conducted on the hand ball players. Who participated upto intervarsity levels of competitions. To achieve the objective of the study the investigator has planned the entire process of

the work in term of research design which is presented systematically under following way.

SAMPLES OF THE STUDY

In the present study the hand ball players performing at intervarsity level of competitions were taken as subjects of the study where a total of 200 subjects at inter college and intervarsity level were surveyed for the collecting of data. The subject were male in the age group of 17-23 years belong to Haryana State specially studying in colleges affiliated to Kurukshetra University and near by Distt. Coaching Centres. The random sampling techniques was utilized to collect the required data of the subject. The participants were keenly examined and tested.

The data were collected doing the period of Sept. 2010 to Sept. 2011. The players were contacted at their respective colleges at Ambala, Kurukshetra, Panchkula, Kalka, Yamuna Nagar, Kaithal, Jind, Narwana, Hissar and during inter college held at Kurukshetra in the M.M. College Shahabad in the month of Nov. 2011. In this study the investigator has selected 200 male hand ball players as subject of the study. Which was planned to analyse the kinanthropometric variables. The investigator has examined the hand ball players playing abilities of each players with the judges rating scale. After investigation of hand ball ability the players of hand ball appeared for the following kinanthropometric measurement to collect the data.

KINANTHROPOMETRIC VARIABLES

Age, body weight

Liner Measurement

Height, total arm length, total leg length

Body circumference (girth)

Chest, arm, abdominal hip, thigh calf and knee circumferences

Diameters

Elbow, wrist, knee, ankle, shoulder and hip diameters

Skinfold measurement

Biceps, triceps skinfold, sub scapular, superailic, chest, midauxiliary, thigh and calf skinfold.

TOOL USED

1.To measure kinanthropometric variables complete set of anthropometric rod and other equipments as manufactured by Anand Agencies Pune available at Kurukshetra University Physical Education Deptt. sports science lab. These equipments are standard equipment used by research scholar in India in various bodies.

2.Diameter were taken with the help of Vernies Caliper and anthorpometric campus.

3.The skinfold caliper was used to measure the skinfold thickness.

4.Standard weight machine, steel type etc. approved by Govt. of India for measuring body weight and distance.

5.All the kinanthropometric measurements were taken to the left side (grade) of the individual on the standard techniques described for each measurement by Weiner and Courie (1969).

6.All the measurement were recorded to the nearest of centimeter (1/10) millimeters.

PROCEEDURES

At first personal data regarding name, age participation level, height, weight were recorded with the help of performa prepared by the investigator himself.

In the first phase, the investigator and his panel of judges recorded the over all playing ability of hand ball which was judged in a competitive game situation at different centers. The players were being observed by the panel of judges in the game situations and were recorded by the investigator himself. The investigator with the help of team, colleges coaches and physical educators to measure the selected kinanthropometric measurements in the second phase.

STATISTICAL DESIGN

To determine the correlation between kinanthropometric variables & playing ability product movement method was used.

ANALYSIS AND INTERPRETATION OF DATA

The mass of data collected in accordance with the research methodology. The finding of the study were obtained and analysing and interpretation of data on the basis of main objective of this study were to examine the kinanthropometry variable in relation to their playing ability. For this investigator has taken 200 male hand ball players of Haryana State and their playing ability of hand ball were judged undu the performance situations on the playing ground. The analysis of 200 hand ball players and their analysis and discussion of finding are present in the following lines.

TABLE - 1

Correlations of selected linear kinanthropometry variables with playing ability (fundamental hand ball accuracy) (n-200 df. 244) co-efficient of correlation (e)

Sr. No.	Variables Correlated with playing ability	Df.
1	Height	176**
2	Sitting Height	690
3	Leg Length	186**
4	Lower Length	0.720
5	Thigh Length	125**
6	Trunk Length	0026
7	Arm Length (Total)	0.1271*
8	Upper Arm Length	0.1733**
9	Fore Arm Length	0.944
10	Hand Length	0.1563*
11	Foot Length	0.1063

** Significant 1% level. $R = 0.164$.

* Significant 5% level. $R = 0.125$.

Table 1 clearly indicates that correlations of height (0.178), total leg length (1.56), upper arm length (173) were positive and significant at 1% level. Where as

thigh length (125), total arm length (0.127) and hand length (0.1563) were significant at 5% level with accuracy performance. Other variables i.e. sitting height, lower leg length, trunk length, fore arm length and foot length had no significant correlations with the accuracy performance of hand ball players.

TABLE – 2

Significant correlation of accuracy performance with girth measurement of hand ball players n=200 df. 2.44

Sr. No.	Variables correlated with accuracy performance	Coefficient of Correlation (r)
12	Arm Girth	-1839**
13	Chest Girth	189**
14	Abdomen Girth	0.786
15	Hip Girth	196**
16	Thigh Girth	1.50*
17	Calf Girth	1.352*
18	Knee Girth	0.0002

**** Significant at 1% level. R - 164.**

*** Significant at 5% level. R – 125**

From Table 2 it is observed that chest (189) had positive & significant correlation at 1% level and arm girth (-183) had negative and significant correlation at 1% level. Where as thigh (-150) and calf girth (0.135) had negative and significant correlation at 5% level with accuracy performance. Other variables had no significant correlations with accuracy performance of hand ball players.

TABLE – 3

Significant correlations of accuracy performance with diameter measurement of hand ball players n=200 df. 0.244

Sr. No.	Variables correlated with accuracy performance	Coefficient of Correlation (r)
19	Elbow Diameter	14.29**
20	Wrist Diameter	174**
21	Shoulder Diameter	1832**
22	Hip Diameter	0.651
23	Knee Diameter	0.301
24	Ankle Diameter	05.96

Significant at 1% Level. R = 164

**Significant at 5% level. R = 125*

Table 3 clearly shows that correlation of wrist diameter (174) had positive & significant correlations at 1% level whereas hip, knee and ankle diameters had no correlations with the accuracy performance (hand ball players).

TABLE – 4

Significant correlation of accuracy performance with skinfold measurements of hand ball players N=200 df. 244.

Sr. No.	Variables correlated with accuracy performance	Coefficient of Correlation (r)
25	Biceps Skinfolds	162**
26	Triceps Skinfolds	1748**
27	Sub Scapular Skinfolds	1562**
28	Suprailiac Skinfolds	-6031
29	Chest Skin	897
30	Mid Auxillary Folds	0.415
31	Thigh Skinfolds	0.134*
32	Calf Skinfolds	

***Significant at 1% level. R=162*

****Significant at 5% level. R=123**

From the table 4 it is clear that the biceps R = 162, triceps 1731 had negative & significant correlation at 1% level whereas sub scapular (154) & calf skinfold (-134) had negative significant correlations with accuracy performance at 5% level other skinfold variables of hand ball players.

TABLE - 5

Multiple correlation of selected kinanthropometric variables with accuracy performance of hand ball players (Set-1)

Dependent (Criterion variables YC)	Selected Independent variables for multiple correlation L's	Coefficient of multiple correlation
Accuracy Performed Set-I	Height X₁	0.803493**
	Leg length X₃	
	Total arm length X₇	
	Hand length X₁₀	
	Calf Girth X₁₇	
	Wrist Diameter X₂₀	
	Biceps skinfold X₂₅	
	Triceps skinfold X₂₆	

N = 200 df. 236

**** Significant at 1% level. R = 3067.**

From table 5 it is found that multiple correlation R (803493) of height leg length, total arm length, hand length, calf girth, wrist diameter, biceps skinfold with accuracy performance of hand players was significant at 1% level as the calculate value of R 0.803493 was more than the tabulated value of R 30677. The size of multiple correlations with accuracy performance is significantly large, hence the regression equation of accuracy performance of hand ball can be developed by these kinanthropometric variables i.e. height, leg length total arm length, hand length, calf girth, wrist diameter, biceps skinfold.

TABLE - 6

Multiple correlation for regression equation of selected kinanthropometric measurements with accuracy performance.

Deponent Criterion Variables YC	Selected independent variables for multiple coefficient regression analysis X's	Coefficient of multiple correlation (R)	Multiple coefficient variables towards (R-2)	Percentage contribution of each independent variables PCX
Accuracy Performance	Height (X ₁) 3031 Leg Length (X ₃) 2730 Total Arm Length (X ₇) 2204 Hand Length (X ₁₀) 2730 Calf Girth (X ₁₇) 2656 Wrist diameter (X ₂₀) 2081 Biceps Skinfold (X ₅) 3028 2665 Triceps Skinfold (X ₂₆) 2655	8033494237	645601	9.3112 (Pc X ₁) 7.4555 (Pc X ₃) 4.8565 (Pc X ₇) 7.0528 (Pc X ₁₀) 4.3316(Pc X ₁₇) 7.1022 (Pc X ₂₅) 6.5298 (Pc X ₂₆)

B.O. Content S.E. of Estimate = 1.43214

*PC * - (??? weight) x n x where beta wiehg bx sd of a/sd of yc*

and r = coefficient of correlation between l and YC

From table 6 it is illustrates multiple regression analysis performed to develop equation for accuracy performance of hand ball players on the basis of height at total leg length (X₃), total arm length (X₇), hand length (X₁₀), calf girth (X₁₇), wrist diameter (X₂₀), biceps skinfold (X₂₅), triceps (X₂₆) in the score form is as follows :-

$$YC - B_0 + B_1 X_1 + B_2 X_3 + B_3 X_7 + B_4 X_{10} + B_5 X_{17} + B_6 X_{20} + B_7 X_{25} + B_8 X_{26} + B_9 + X_{27}$$

$$YC = 69.45270 + 0.3051 (\text{height} + 0.2730) (\text{Total leg length}) + 0.2204 (\text{total arm length}) + 0.2656 (\text{Hand Length}) + 0.2081 (\text{calf girth}) + 0.3028 (\text{wrist diameters}) + 0.2665 (\text{Biceps skinfold}) + 0.2555 (\text{triceps skinfold}) + 0.2959 (\text{sub scapular})$$

Where Y, Predicted accuracy of hand ball, players X_1 Height, X_5 = total leg length, X_7 = total arm length X_{10} hand length, X_{17} calf girth X_{20} , wrist diameter, X_{25} , Biceps skinfold, X_{26} , Triceps Skinfold X_{27} (Sub scapular skinfold).

The value of determination of multiple correlation $R^2 = 0.645603$ indicates that 64.56 percent of the variance by nine kinanthropometric variables i.e. height, total leg length total arm length hand length calf girth, wrist diameter, biceps, triceps, skinfold and sub scapular skinfold. While the remaining 35.44 percent of variance still to be accounted for their variables.

Further the determination of multiple correlation (R^2) can be evaluated which shows that height, total leg length, arm length, hand length, calf girth, wrist diameters biceps, triceps and sub scapular skin fold contribute 9.3112, 7.4555, 4.6565, 7.0528, 4.3316, 9.1665, 7.1022, 6.5298 and 8.7542 percent respectively towards various performance score independently.

The standard error S.E. of estimate 1.43214 as shown in the table 7 that 64.56 percent of obtained accuracy performance scores lies within ± 1.43214 of the performance score.

The multiple correlations obtained is of sufficient size of the equation developed could not put into the equation for the prediction of the accuracy performance of hand ball players with this degree of accuracy.

DISCUSSION OF THE RESULT ACCURACY (Main findings)

1. It is very clear from the results that linear measurements i.e. height, leg length, thigh length, total arm length, upper arm length and hand length correlation hand significant and positive as shown in tables. These variables contribute the accuracy performance of players since length of bones and diameter of bones act as lever of the body.
2. Correlation of girth i.e. arm girth, chest, hip, thigh and calf girth as shown in table 2 has positive and significant correlation.
3. Correlation of diameters i.e. elbow, wrist, shoulder diameter also shown as positive and significant correlations multiple correlation of various variables i.e. height leg arm total length, hand length, calf girth, wrist diameter, biceps, triceps and subscapular skinfold taken together have significant correlation with accuracy. Performance of hand ball players and this multiple correlation was very high and hence the regression equation developed by these variables could be used for the prediction of the accuracy performance of hand ball players.

The results of the present are complete agreement with studies conducted by other scientist. Such as A.N. Dey (1991) Bola Gurdeep (2003), Subash Kumar (1995), Murlidhar

(1989), Nitin (2007), Parmada Devi (1987), Chuhan Ms. (1988), V.P. Sharma & J.C. Sharma (1987).

The study shows that there would be exist significant correlation between kinanthropometry and performance of hand ball special in accuracy is total accepted.

CONCLUTION ACCURACY

1. It is very clear from the results that liner measurements i.e. height, leg length, thigh length, total arm length, upper arm length, hand length correlation have significant and positive as shown in tables. These variables contribute to the accuracy performance of players since length of bones and diameters of bones act as liver in the body which assist in the execution of playing skill of handball players.
2. Correlation of girth i.e. arm girth, chest girth, hip girth, thigh girth, & calf girth as shown in the tables have positive and significant correlations which shows the growth of various girths help in generating more force and hence increase the performance of the handball players,
3. Correlation of diameters i.e. elbow diameter, wrist diameter, & shoulder diameter as shown in results have positive and Significant correlation which shows that growth of various diameters of the joints help in making large & strong leverage which help in producing more force and hence increase the throwing performance of the players.
4. Multiple correlation of various variables i.e. height, leg length, total arm length, hand length, calf girth, wrist diameter, biceps skinfold, speed & muscular strength, taken together have significant correlation with accuracy performance of hand ball players and this multiple correlation is very high and hence the regression equation developed by this variables could be used for the prediction of the accuracy performance.

SUGGESTION & RECOMMENDATIONS

On the basis of results it is suggested and recommendation that :

1. The result of the study are very useful for selecting the talent hunt of the hand ball players.
2. The result of the study are also helpful to coaches & physical education teachers to construct the training schedule for the preparation of hand ball players for better performance in competitions.
- 3 The similar studies may be conducted on other games and sports to develop the motor fitness and anthropometric norms for better performance of the players.

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