
Prediction of Kinanthropometric Characteristics of Handball Players in Relation to Their Playing Position

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Abstract: The present was designed to determine the Prediction of Kinanthropometric Characteristics of Handball Players in Relation to Their Playing Position. For this purpose all the seven playing positions of handball team were assessed. Handball players were selected as subjects for the study the study was confined to A total of two hundred eighty (N=280 which includes n=40 from each playing position i.e. goal keepers, left backs, centre backs, right backs, left wingers, right wingers and pivot players respectively) male handball players were selected as subjects. All players were confined to All India Inter University Championship and Senior National level Handball Championship only. kinanthropometric characteristics variables and the tests were selected for the purpose of the study which is presented in the following Kinanthropometric characteristics Height, Weight, Biceps Skin fold, Triceps Skin fold, Sub-scapular Skinfold, Supra- Spinal Skin fold, and Calf Skinfold. The random sampling technique was used to select the required sample. In order to find out the relationship among the kinanthropometric characteristics with playing performance, the Pearson's Product Moment correlation Technique was employed. The level of significance to test the hypothesis was set at 0.05 level. All the statistical procedures were performed by the statistical computer software SPSS (Version 16). Results of the study explicated statistically that there was showed significant relationship with playing performance of different playing positions of hand ball players height, weight, biceps skin fold, triceps skin fold, sub-scapular skin fold, supra spinal skin fold, calf skin fold .

Keywords: *height, weight, biceps skin fold, triceps skin fold, sub-scapular skin fold, supra spinal skin fold, calf skin fold, hockey players and kinanthropometric.*

Introduction:

In many sports, body composition is important for optimal physical performance. Generally, a relatively low body fat is desirable to optimize physical performance in sports requiring jumping and running. A large muscle mass enhances performance in strength and power activities. Because of this performance – related implications, coaches, parents, exercise scientists, sports medicine specialists, and of course the athletes themselves have an interest in body composition. Typically, athletes and physically active individuals are leaner than sedentary individuals, regardless of gender. However, female athletes have relatively greater body fat than male athletes in a given sport, and the average body fatness depends on the type of sport and the athletes' position (Wilmore, 1983).

Anthropometric variables, such as height, weight, body mass index, percent body fat, knee height, length of femur, femur biepicondylar diameter, skeletal mass and back strength, and two performance tests, such as sit and reach test and Slalom sprint and dribble test were measured on 120 Indian inter-university male hockey players aged 18–25 years. Result showed that there was no significant correlations of back strength were found with any of the variables in Indian inter-university male field hockey players. It stated that back strength may not be used as one of the indicating factors for the performance of the field hockey players Koley and Kar (2017).

National level hockey and cycling players of 11-21 years. Variables such as vertical jump, weight, height, trochanterion-height, sum of skin fold thickness, lengths (acromiale-stylion and midstylion-dactylion), breadths (biacromial, biiliocrystal, biepicondylarhumerus and biepicondylar femur), girths (relaxed arm, mid thigh and calf), lower back and hamstring flexibility, grip (left hand grip and right hand) and back strength were measured and evaluated as per International Society for the Advancement of Kinanthropometry (ISAK) procedures. Unpaired-'t'-test was used for comparison between genders. Pearson's correlation and multiple regression analysis were used to evaluate correlates and predictors of vertical jump respectively. The results of the study showed that males had significantly higher vertical jump, height, midstylion-dactylion, biacromial and back strength; but lower sum of skin fold thickness, scromiale-stylion and mid thigh. Vertical jump correlated positively with age, weight, height, midstylion-dactylion, mid thigh, girths, hamstring flexibility and strength among males; but only with weight and left hand grip among females. After controlling gender, trochanterion-height and left hand grip predicted vertical jump significantly with 69% of total variance. Height, sum of skin folds and back strength; and left hand grip were the significant predictors among males and females respectively. Further study concluded

Anthropometric and physiological variables like trochanterion-height, grip, height, skin fold and back strength had major influence on vertical jump Sharma et al.(2017).

This study was done with the aim of kinanthropometric characteristics on handball players. Keeping in the mind the importance of kinanthropometric variables at handball players for attaining for development and enhance the performance of players, the investigators therefore, designed a study to assess the Prediction of kinanthropometric characteristics of Handball Players in Relation to Their Playing Position.

Methodology and Procedure

The purpose of this study was to predict the kinanthropometric characteristics of handball players in relation to their playing position. For this purpose all the seven playing positions of handball team were assessed. Handball players were selected as subjects for the study the study was confined to A total of two hundred eighty (N=280 which includes n=40 from each playing position i.e. goal keepers, left backs, centre backs, right backs, left wingers, right wingers and pivot players respectively) male handball players were selected as subjects. All players were confined to All India Inter University Championship and Senior National level Handball Championship only. The random sampling technique was used to select the required sample.

Adopting the above criteria, the following kinanthropometric characteristics variables and the tests were selected for the purpose of the study which is presented in the following.

1. Kinanthropometric characteristics

1. Height
2. Weight
3. Biceps Skin fold
4. Triceps Skin fold
5. Sub-scapular Skinfold
6. Supra- Spinal Skin fold
7. Calf Skinfold

Table - 1
Descriptive statistics of the Kinanthropometric Characteristics Variables and Playing Performance of Right wing handball players

Variables	Mean	Std. Deviation
Height	170.10	4.04
Weight	71.90	3.63
Biceps Skinfold	5.65	.51
Triceps Skinfold	6.38	.45
Sub-scapula Skinfold	10.50	.28
Supra-spinal Skinfold	10.62	.24
Calf Skinfold	3.28	.27

Table 1 shows the Mean and SD values of kinanthropometric characteristics of right wing handball players as follow; Height= 170.10 ±4.04, Weight=71.90± 3.63, Biceps skinfold =5.65±.51, Triceps skinfold =6.38±.45, Sub-scapular skinfold =10.50±.28, Supra-spinal skinfold =10.62 ± .24 and Calf skinfold =3.28 ± .27, respectively. Further Correlation Analysis of Kinanthropometric Characteristics Variables with the Playing Ability of Right Wing Handball Players have been presented in table 2.

Table -2
Correlation Analysis of Kinanthropometric Characteristics Variables with regard to Playing Performance of Right Wing Handball Players

Variables	Pearson Correlation Coefficient (r)	Sig
Height	.366	.010
Weight	.387	.007
Biceps Skinfold	.311	.026
Triceps Skinfold	.342	.015
Sub-scapula Skinfold	.325	.020
Supra spinal Skinfold	.397	.006
Calf Skinfold	.288	.036

Level of Significant at 0.05

Table 2 depicts the correlation analysis of the kinanthropometric characteristics variables with regard to playing performance of right wing handball players. The result of the study shows that there was a significant positive association of height (r=.366, p=.010) and weight

($P=.387$, $P=.007$) with the playing performance of right wing handball players. There was a significant positive association of the playing performance of right wing handball players with biceps ($r=.311$, $p=.026$), triceps ($r=.342$, $p=.015$), sub-scapula ($r=.325$, $p=.020$) supra-spinal ($r=.397$, $p=.006$) and calf skinfold ($r=.288$, $p=.036$) measurements.

Graphical representation of relationship between kinanthropometric characteristics variables with regard to playing performance of right wing handball players has been depicted in figure 1, 2,

Figure 1: Graphical representation of Correlation Analysis of Height and Weight Variables with the Playing Performance of Right Wing Handball Players

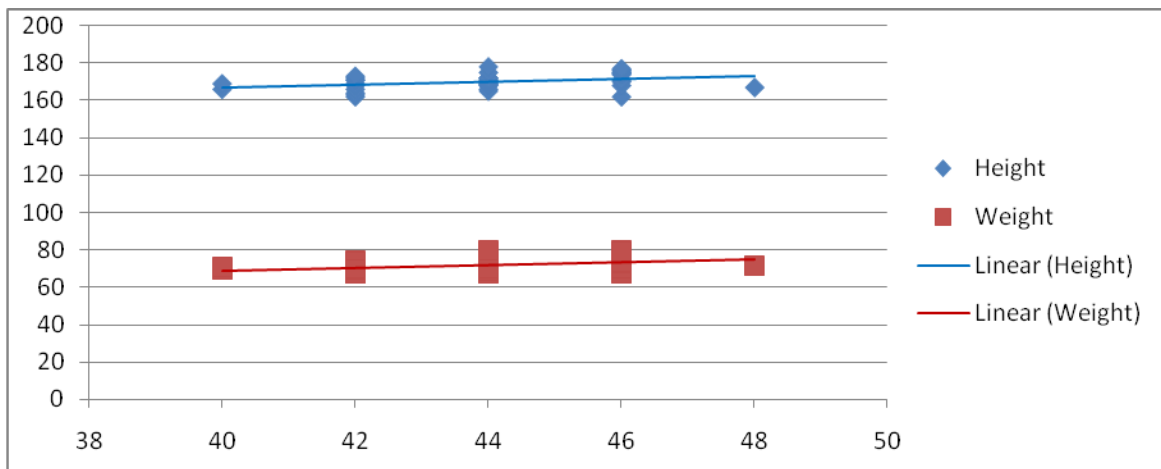
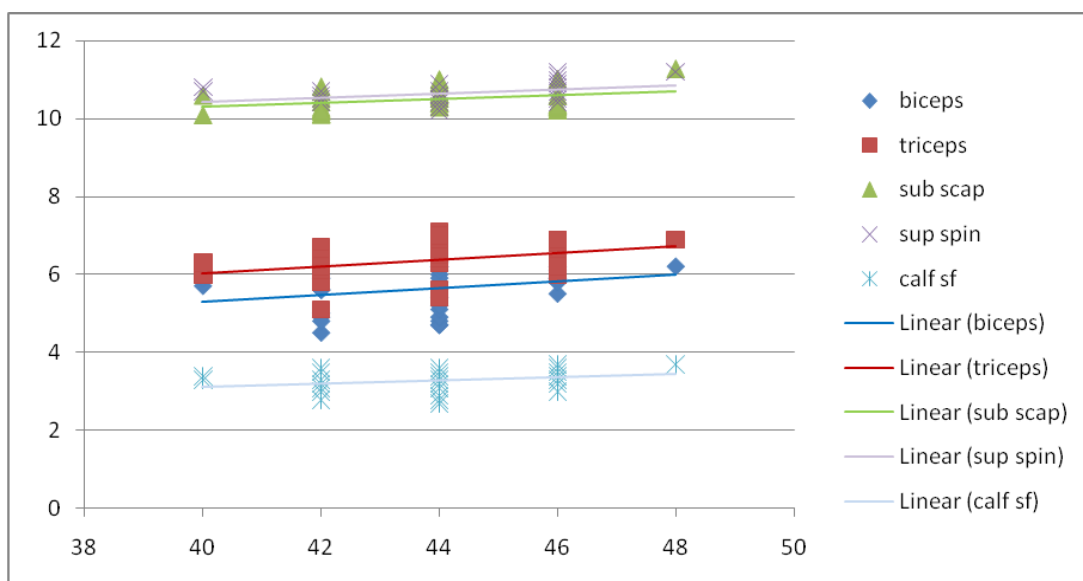


Figure 2: Graphical representation of Correlation Analysis of biceps, triceps, sub-scapular, supra spinal and Calf skinfold Variables with the Playing Performance of Right Wing Handball Players



Discussion

The objective of the study was to assess the kinanthropometric characteristics and motor ability components male handball ball players of different playing positions. The associations of kinanthropometric characteristics and motor ability components with the playing performance of male handball players were also studied. The playing performance male handball players of different playing positions were predicted through kinanthropometric variables and motor ability components. There were seven different playing positions in handball such as goal keepers, left backs, centre backs, right backs, left wingers, right wingers and pivot players.

Therefore, the playing performances of these seven different playing positions were analyzed separately. Anthropometric variables namely supra-spinal, triceps, biceps skinfold, arm girth and knee width were contributing significantly for explaining the performance of the left wing, right wing, left back, centre back, right back and pivot handball players. Various skinfolds were key predictor in explaining the performance of the handball players. It may be attributed to the fact that body composition such as better muscle mass empowers the athlete to produce more vigorous and proficient movements for long duration without compromise the quality of skills. Arm girth on the other hand related with the muscle cross section, therefore, it enabled the player to shoot the ball with greater force and velocity. In order to support superior muscle mass, larger knee width is related with superior skeleton structure which prerequisite for muscular attachments. In relation to goalkeepers anthropometric variables namely supra-spinal skinfold, arm length, wrist width, knee width and leg length were the predictors. Superior arm and leg length provided the goalkeepers additional reach to stop the balls away from their body while protecting the goals. Skinfold measurement and width of joints were associated superior body structure and muscle mass that facilitate the explosive and fast body movements. These findings were similar to the results of study conducted by Tanwar (2013), Singh and Ram, (2013).

Conclusion of the Study

On the basis of above findings of present study, the following conclusion have been drawn. It is concluded that kinanthropometry characteristics i.e. height, weight, biceps skin fold, triceps skin fold, sub-scapular skin fold, supra spinal skin fold, calf skin fold, elbow width, knee width, wrist width, arm girth, calf girth, arm length and leg length showed significant relationship with playing performance of different playing positions of hand ball players.

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