Physical and Anthropometric Comparison of Selected Team Games University Players

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Abstract

The purpose of the study was to compare the Anthropometric measurements and physical fitness components among team games. The subject for this study were forty-five ($n = 45$) male players in which fifteen of were handball sports, and remaining fifteen-fifteen were of Basketball and Volleyball sports. The subjects selected for the study were all India university players. The variables selected for the study under Anthropometric measurements were shoulder width, arm length, elbow breadth, waist circumference, calf circumference, and leg length whereas physical fitness components were speed, agility, explosive leg strength, and flexibility. All three selected groups were assessed for the anthropometric measurements as well as the physical variables required for the comparison using standardized procedure recommended by established literature. Data were analyzed using Statistical Package for the Social Sciences and the descriptive statistics were expressed as mean (SD) and standard deviation for each variable, while ANOVA test was applied to compare the groups on the basis of selected parameters. The results showed no significant difference in all selected anthropometric as well as the physical parameters except flexibility ($F = 3.709$; $P = 0.033$) at 0.05 alpha level and the researcher concluded on the basis of results that because of symmetricity in movement patterns in the court as well as the same nature of activity and anthropometric similarity (Height) did not create much difference in all selected anthropometrical and physical performance parameters while comparing handball, basketball, and volleyball players all together.

Keyword: Anthropometric measurements, Physical performance components, Team game sports

Introduction

Fitness is today's world is not a matter of more muscular or physical capacity. A true concept of physical fitness mental, emotional, social positive fitness must mean the optimum development of each of these aspects and emphasize the ability of person to line more effective with in his potentialities. Health-related physical fitness is a series of measures of physical and physiological characteristics that define the risk of premature development of diseases or morbidity and which are associated with a sedentary lifestyle, or are those components of physical fitness that are affected by routine activity and are related to health status. Physical Fitness is an important as the man himself. By physical fitness, we mean fitness is terms of health and skill-based performance. A person can be said to be physically fit if he has the ability to perform physical activities which required strength, flexibility or Endurance. In this fast-pacing life, everyone has a very hectic schedule.

Physical fitness as a term alludes to the aggregate unique physiological condition of the individual extending on a continuum from ideal human execution to serious incapacitation and passing. Competitors would be found toward the upper end of the continuum fluctuating up or down contingent on their condition of preparing while at the other and states of ailment could exist while this term might be acceptable in a spellbinding sense, issues emerge when endeavours are made to characterize the idea in an operational way, that is, the point at which we attempt to gauge or create it.

Anthropometric measurements of body structure are the most seasoned kind of body measurement, known, going back to the start of written history. It was additionally an early sort of testing in physical education. Anthropometric and physical fitness characteristics provides important information about normality of body size, health condition, and body shape.[1,2] In addition, physical activity is an important means to reduce and control weight and

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diverse health risk factors.[3] It is interesting to study some of these characteristics in the students of the faculty of physical education and sports, as they will be the next generation of teachers who will educate the younger generation about having an active life style and good health.[4]

Aim of the Study

The aim of the present work is to analyze the anthropometrical status and physical performance parameters of similar movement pattern team games, that is, volleyball, basketball, and handball and compare their competency in among.

Materials and Methods

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

Study Design

This study includes descriptive comparative research which is used to describe and compare selected anthropometric and selected characteristics among the group.

Study Population

For the purpose of the study, total 55 (*n* = 45) all India inter-university male players were selected purposively in which 15 (*n* = 15) basketball, 15 (*n* = 15) handball, and 15 (*n* = 15) volleyball players were subcategorized, respectively, as three different groups for comparing their physical and Anthropometric competency because all three selected groups indicated symmetricity in nature of sports (tackling ball on court with hand).

Inclusion Criteria

The following criteria were included in the study:
- Age ranged from 18 to 25 years male players were purposely selected.
- All India Interuniversity players represented L.N.I.P.E. were selected in the study.
- The anthropometric and physical fitness measurements were included as performance variables.
- Subjects having five and more years of match experience of tournaments.

Exclusion Criteria

The following criteria were excluded in the study:
- Players did not participate in interuniversity tournament were excluded from the study
- Players which were having any kind of chronic as well as acute injury were opting out from the study.

Procedure

The selected subjects were assembled, and the instructions were given by the researcher regarding procedure and administration of test. To identify the physical parameters of all selected groups, speed assessed by 50 m dash (in seconds), explosive strength of legs assessed by standing Broad Jump test (in cm.), flexibility assessed by sit and reach test (in cm.) and agility assessed by 10 × 4 m shuttle run (in seconds) tests were selected for the present study. On the other hand, sliding caliper and anthropometric rode were used for anthropometrical measurements, that is, height, weight, shoulder width, arm length, elbow width, waist circumference, leg length, calf circumference, and all parameters were measured in cm. Proper warming up was given to the subjects to procure them from the injury. Testers were assigned for each test station with required equipments. The total two trials were given to the subjects for the tests and best trial was considered as final performance for the present study. 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 players who had a curiosity to know for their acknowledgment and invited to ask questions if they wished.

Statistical Technique

Statistical analysis was done with Statistical Package for the Social Sciences. Mean and standard deviation was calculated as a descriptive statistic and to compare the selected anthropometric and physical fitness components among handball, basketball, and volleyball players one-way ANOVA was used as a statistical technique at 0.05 level of significance. The distribution was normally distributed as the Shapiro–Wilk test for normality was insignificant ($P > 0.05$) in case of all three groups.

OBSERVATIONS AND RESULTS

The present study was designed to compare anthropometric measurements and physical fitness components between handball, basketball, and volleyball players. The results of the descriptive statistics (mean ± standard deviation) as well as the comparative statistics ANOVA (f value) to compare the selected anthropometric measurements and physical components, one way ANOVA with 0.05 level of significance has been employed to assess the result of the comparison among them and the outcomes has been shown below in Table 1.

Table 1 showed the descriptive and comparative statistics of handball, basketball, and volleyball players which includes mean and standard deviation of all selected physical and anthropometrical variables and the result indicating negligible difference when comparing all three selected groups on the basis of its mean value which can be effectively observed in Figure 1 as graphical representation. ANOVA statistics, on the other hand also showed the insignificant difference as the *P* value was more than 0.05 alpha level ($P > 0.05$) in case of all selected physical and anthropometrical variables except flexibility (F = 3.709; P = 0.033) concluding that the null hypothesis failed to rejected in all selected physical and anthropometrical variables except flexibility.

DISCUSSION

The present study indicates the anthropometric and physical profile of volleyball, basketball, and handball followed by compare these parameters in among because of their same nature of activity, and the results of the study revealed the insignificant difference in almost anthropometric and physical performance components among handball, basketball, and volleyball players which significantly probes its strong dominancy for preparing and describing a athlete in sport performance in any sports or all levels
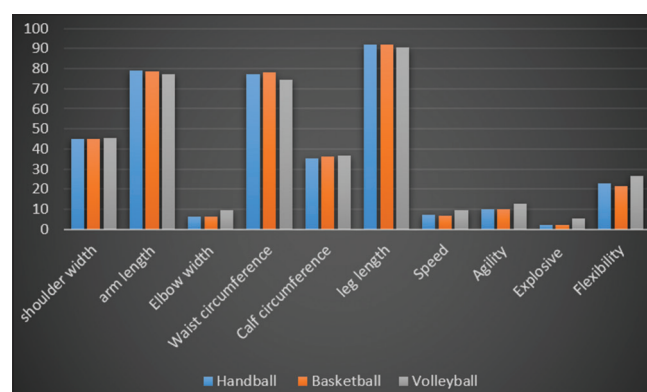

Figure 1: Graphical representation of selected physical and anthropometrical variables

Table 1: Outcomes of selected anthropometric and physical parameters of all selected groups

Variable n=15/Group	Mean Handball basketball volleyball			Standard Deviation Handball basketball volleyball			ANOVA Statistics
Shoulder width	45.26	45.13	45.66	.96	1.24	1.34	F=0.809 Sig.=0.452
Arm length	79.13	78.73	77.26	2.16	1.94	8.26	F=0.566 Sig.=0.572
Elbow width	6.63	6.59	9.50	.22	.27	10.65	F=1.100 Sig.=0.343
Waist circumference	77.26	78.00	74.46	2.76	3.25	8.21	F=1.824 Sig.=0.174
Calf circumference	35.23	36.44	36.77	1.25	1.58	3.22	F=2.045 Sig.=0.142
Leg length	91.83	91.84	90.73	3.03	2.56	12.00	F=0.115 Sig.=0.892
Seed	7.25	7.06	9.81	.45	.42	10.56	F=0.948 Sig. =0.396
Agility	10.09	10.30	12.77	.30	.55	9.75	F=1.049 Sig. =0.359
Explosive	2.33	2.36	5.55	.12	.10	11.74	F=1.114 Sig. =0.338
Flexibility	22.93	21.46	26.53	5.13	3.46	6.64	F=3.709 Sig=0.033*

*$P<0.05$ is significant

of competitions.[5,6] The same outcomes also reported by the Pasa *et al*. in 2019 in which the compare junior basketball and volleyball payers in their anthropometric characteristics and found no any significant difference.[7]

It is very important to remember that athletes from the sports such as handball and basketball involved same movement patterns in court such as dribbling, tackling, blocking, and dodging that is why no difference in competencies were expected primarily. Combining volleyball with both these sports, these are sports in which taller players have an edge in defence and attack since they can easily complete the basic movements of the game. Height helps players in saving the ball and blocking attacks in both basketball and handball, and it is also advantageous because a higher player is closer to the ring or goal post which leads for the successful attempt toward the target to score point.[8] On the other hand, height helps to prevent the opponent's attack in volleyball, the smash allows the attacker to strike the ball from a higher height and thus acquire a better angle for the attack and a greater chance of deciding where the ball will be placed on the opponent's field[9] and these symmetricities in all three selected sports demands equal anthropometric characterises as well as the physical preparation to perform well.

Flexibility was the only variable which showed significance difference (f = 3.709; $P = 0.033$) among the groups and further, the pairwise comparison was conducted to find the sports with greater flexibility among all three groups. The volleyball group reported the greater flexibility ($t = 5.06$; $P = 0.011$) in comparison to basketball groups whereas results also reported that the flexibility of handball and basketball group were equally poor ($t = 1.46$; $P = 0.448$) as compare to volleyball groups.

CONCLUSION

On the basis of finding, the researchers came to conclude that there was no any significant difference reported in all anthropometric parameters, that is, shoulder width, arm

length, elbow width, wrist circumference, leg length and calf circumference whereas, agility, explosive leg strength and speed were the physical related performance parameters those also did not show any significant difference among all three selected groups. On the other hand, the research also concluded that the flexibility was only the variable reported the significant difference among basketball, handball, and volleyball players.

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