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Comparative Study of Selected Physical Fitness Components among Basketball, Handball and Volleyball Players

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Abstract

The purpose of this study was to compare the selected physical fitness components among the basketball, handball and volleyball players. For this study investigator randomly selected ten for each game in volleyball, basketball and handball at the age group of 20 to 25 years from YMCA College of Physical Education, Chennai. The data collected for the selected physical fitness test and were statistically analyzed to find out the purpose of comparison whether there were any significant difference in the various selected components of physical fitness among the volleyball, handball and basketball. The mean was calculated from the obtained data. By computing the F ratio the difference in mean of the volleyball, handball and basketball players were tested for statistical significance. The level of significance was set at 0.05 level. Each dependent variable and the total scores were compared separately and each "f" value was calculated. There were no difference in speed, agility and arm strength among the volleyball, handball and basketball players. In explosive power the volleyball players obtained the highest value when compared to basketball and handball players.

Keywords: Basketball, Handball, Volleyball, Physical Fitness.

Introduction

Physical fitness is very familiar but rather vague term. In board term it involves the ability of individual to perform his usual activities with vigour and alertness, without getting unduly fatigue and also to have enough energy reserve to meet unforeseen emergencies and enjoy leisure time pursuits. "A sound mind in a sound body is a short but full description of a happy state in world. He that has these two, has very little to wish for." Fitness is the capacity of an individual to live and function effectively, purposefully and tastefully and to meet constantly the problems and crises which are among lives expectations. Physical Education emphasizes the importance of physical activities as they are directly related to growth and development; movement is the basis of life and growth. The value of exercise through physical education, sports and games is an enjoyable game and definitely increases the best for life for the child and it is an important educational tool offering endless means for physical fitness. The fundamental aim of children's movement is to provide involvement in physical activity in a way which promoted immediate and long term benefits for the participants. Through play the child learns about himself and the people around him. The children as well as animals have not waited for people to teach them playing. They have done this by themselves in a manner that is serious and full of meaning. Fitness has become a national concern. Basically, fitness means, being a good physical condition and being able to function at one's best level. But perfect fitness for living necessarily involves spiritual, mental, emotional, social and physical qualities.

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Statement of the Problem

The purpose of this study was to compare the selected physical fitness components, namely, speed, power, agility and arm strength of basketball, handball and volleyball players.

Hypothesis

It was hypothesized that there would not be any significant difference among basketball, handball and volleyball player in the selected physical fitness components.

Methodology

This study has been designed to compare the physical fitness components speed, explosive power, strength and agility among basketball, handball and volleyball players. To achieve this purpose ten players were randomly selected from basketball, handball and volleyball teams. The investigator has chosen men players from YMCA College of physical education between the age group of 21 to 25 years based on their

college record.

Selection of Variables

The investigator reviewed the available scientific literatures pertaining to physical fitness from books, periodicals and research papers. According to the discussion with experts, availability of instruments and relevance of the variables to the present study, the following variables were selected.

1. Speed
2. Arm and shoulder strength
3. Explosive power of leg extensor muscles
4. Agility

Analysis of the Data

Selection of Test Items

The following test items were selected to measure the physical fitness components.

S.No	Components	Test items
1	Speed	50 Meters dash
2	Arm and shoulder strength	Pull ups
3	Explosive Power of leg extensor muscles	Standing broad jump
4	Agility	Shuttle Run

Statistical Techniques

The collected data were analyzed statistically to test the various hypothesis formulated

$$\text{F ratio} = \frac{\text{MS (b)}}{\text{MS (w)}}$$

To achieve the purpose the statistical technique ANOVA was used as suggested by Clarke and Clarke.

MS (b) = mean source of variance between the groups.

MS (w) = mean source of variance within the group.

Significant differences if any were tested by scheffe's test.

Table I. Comparison of speed among basketball, handball and volleyball players

Source of variation	Sun of squares	Df	Mean squares	Obtained F Ratio	Required F Ratio
Total	29.183	29		1.68*	3.34
Treatment (msb)	3.23	2	1.613		
Error (ms)$_w$	25.955	27	50.96		

*Not significant at 0.05 level of confidence

Table value (0.05) (2, 27) = 3.34

Table I indicate that there were no significant differences in speed strength among basketball, handball and volleyball players. The 'F' value required to be significant at 0.05 level was 3.34. The calculated value 1.68 was less than the required value 3.34 to be significant at 0.05 level. Therefore the null hypothesis was accepted.

Table II. Comparison of strength among basketball, handball and volleyball players

Source of variation	Sun of squares	Df	Mean squares	Obtained F Ratio	Required F Ratio
Total	184.7	29		2.09*	3.34
Treatment (msb)	24.8	2	12.4		
Error (ms)$_w$	159.9	27	5.92		

*Not significant at 0.05 level of confidence

Table value (0.05) (2,27) = 3.34

It would be seen from the above table that there was no significant difference in arm strength among basketball, handball and volleyball players. The 'F' value required to be significant at 0.05 level is 3.34. The calculated value 2.09 was less than the required value 3.34 to be significant at 0.05 level. Therefore the null hypothesis was accepted.

Table III. Comparison of explosive power among basketball, handball and volleyball players

Source of variation	Sun of squares	Df	Mean squares	Obtained F Ratio	Required F Ratio
Total	1.559	29		8.21*	3.34
Treatment (msb)	0.590	2	0.295		
Error $(ms)_w$	0.970	27	0.04		

*Not significant at 0.05 level of confidence
Table value (0.05) (2, 27) = 3.34

It would be seen from the above table that there was no significant difference in explosive power among basketball, handball and volleyball players. The 'F' value required to be significant at 0.05 level was 3.34. The calculated value 8.21was greater than the required value 3.34 to be significant at 0.05 level. Therefore the null hypothesis was rejected.

Table IV. Comparison of agility among basketball, handball and volleyball players

Source of variation	Sun of squares	Df	Mean squares	Obtained F Ratio	Required F Ratio
Total	6.268	29		2.57*	3.34
Treatment (msb)	1.002	2	0.501		
Error $(ms)_w$	5.265	27	0.20		

*Not significant at 0.05 level of confidence
Table value (0.05) (2, 27) = 3.34

Table IV indicate that there were no significant differences in agility strength among basketball, handball and volleyball players. The 'F' value required to be significant at 0.05 level was 3.34. The calculated value 2.57 was less than the required value 3.34 to be significant at 0.05 level. Therefore the null hypothesis was accepted. The adjusted mean value of the three games, basketball, handball and volleyball and their required mean difference as calculated by Scheffe's Test were presented in Table V.

Table V. Ordered adjusted mean for basketball, handball and volleyball players for significance using scheffe's test

Volleyball	Basketball	Handball	Mean	Scheffe's Test
2.52	-	2.22	0.288*	0.21
2.52	2.50	-	0.18*	
-	2.50	2.22	0.306*	

*Significant at 0.05 level

Volleyball players were better in explosive power than handball players ($p < 0.05$). There was no difference between basketball and volleyball players ($p > 0.05$) in explosive power. Basketball players were better than handball players on explosive power ($p < 0.05$).

Discussion on Findings

The game volleyball needs explosive power, strength, agility and speed. Each skill required scientific exercise and training to achieve the above purpose. There were no significant differences in the selected physical fitness component, namely, strength, agility and speed among volleyball, handball, basketball, players at 0.05 level of significance. This shows that the physical fitness

components of volleyball, basketball and handball were same. The data collected on explosive power among volleyball, basketball and handball show that there was a significant difference among the volleyball, basketball and handball players; but there was no significant difference among the volleyball, basketball and handball players in the explosive power at 0.05 level of significant.

Conclusion

The following conclusions were drawn based on the limitations and delimitation of study.

1. There were no difference in speed, agility and arm strength among the volleyball, handball and basketball players.
2. In explosive power the volleyball players obtained the highest value when compared to basketball and handball players.
3. The basketball players obtained a higher score in explosive power than the handball players.

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