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Showkat Mushtaq Teeli

M.Phil Scholar, Mewar
University Chittorgarh
Rajasthan, Rajasthan, India

Dr. Amaresh Kumar

Assistant Professor, Department
of Physical Education and
Sports, Mewar University
Chittorgarh, Rajasthan, India

A comparative study of physical Fitness components of basketball and handball players of Mewar University, Chittorgarh Rajasthan

Showkat Mushtaq Teeli and Dr. Amaresh Kumar

Abstract

General fitness implies the ability of a person to live most effectively with his/her potential, which depend upon the physical, mental, emotional, social and spiritual components of fitness which are highly interrelated. There was no statistically significant effect of strength between basketball and handball players. There was no statistically significant effect of abdominal strength between basketball and handball players. There was statistically significant effect of explosive strength between basketball and handball players. There was no statistically significant effect of endurance between basketball and handball players.

Keywords: Comparative study, physical fitness, basketball, handball, players etc.

Introduction

This is probably the most popular and frequently used term in physical education and to develop physical fitness is the most important objective of physical educators. According to Nixon and Cozens (1964), it was the desire to establish a scientific approach to the development of physical fitness which formed the basis of the first meeting of physical educators in 1885 when the profession of physical education originated. The United States President's Council on Physical Fitness and Sports defined the terms physical fitness as "the ability to carry out daily tasks with vigour and alertness without undue fatigue, with energy to enjoy leisure time pursuits, and to meet unforeseen emergencies" (Clarke, 1971). General fitness implies the ability of a person to live most effectively with his/her potential, which depend upon the physical, mental, emotional, social and spiritual components of fitness which are highly interrelated. The primary components of physical fitness which are highly interrelated. The primary components of physical fitness identified by the president's Council on Physical Fitness and Sports were muscular strength, muscular endurance and cardio respiratory endurance. However, later on the president council also included some other motor performance components namely agility, speed, flexibility and balance in physical fitness. But keeping in view the general opinion of the majority of the researchers. The author has not included the components such as speed, agility, power and balance (which are more important for success in specified sports) as essential components of basic physical fitness. However the author defines physical fitness by the group of five components, namely muscular strength, muscular endurance, cardiovascular endurance, freedom from obesity (proper body composition) and flexibility. It is important to mention here that some of the experts e.g, Clarke and Clarke, 1987, AAHPERD, 1980, 1984) call such fitness tests which include the measurement of percentage body fat, as health-related physical fitness tests. The physicians Kraus and Weber (1961) demonstrated that certain diseases like low back pain, obesity, hypertension, degenerative cardiovascular diseases, abdominal poses, foot problems etc. are the conditions produced by sedentary life style of the affluent and tension producing society. These diseases are the consequent of lack of exercise and are termed as hypokinetic diseases. It has also been reported that sedentary people suffer a higher incidence of coronary heart disease than active persons (Moris *et al.* 173, Parffenbarger and Hale, 1975). Hence, this concept of physical fitness directly conveys a meaning of healthful living. Through the process of factor analysis, Fleishman (1964) and Falls *et al.* (1965) have prescribed specific physical fitness test batteries.

Corresponding Author:

Showkat Mushtaq Teeli

M.Phil Scholar, Mewar
University Chittorgarh
Rajasthan, Rajasthan, India

General physical Fitness (Three Ss) i. Strength 1. Muscular Strength Stamina 2. Muscular endurance ii. 3. Cardio pulmonary Endurance iii. Suppleness 4. Flexibility	Body composition or Freedom from excess fat or obesity	Health Related physical Fitness
Health-related physical Fitness components 1. Muscular Strength 4. Flexibility 2. Muscular Endurance 5. Freedom 3. Cardio-Vascular From obesity Endurance	Motor performance Components 1. Power 4. Flexibility 2. Speed 5. Reaction 3. Agility Time	Motor Fitness (10 components)
Motor Fitness components 1. Muscular Strength 5. Flexibility 2. Muscular Endurance 6. Power 3. Cardio-Vascular 7. Speed Endurance 4. Freedom From 8. Agility Obesity 9. Balance 10. Reaction time	Motor Coordinating or Motor Control 1. Hand eye co-ordination 2. Foot eye co-ordination 3. Whole Body co-ordination	General Moor Ability (GMA) (113 items)
General Motor Ability 13 (items)	Skill ability or motor Educability (sports specific)	Sports Specific Motor Ability

Muscular Strength

Maximal contraction power of the muscles is known as muscular strength. The muscular strength is usually measured with respect to individual group of muscles acting together. Muscular strength is tested with the help of dynamometers and or densitometers which measure the amount of force exerted in a single effort by a particular group of muscles.

Muscular Endurance

The duration for which the muscles groups may perform work maximally is known as muscular endurance Muscular endurance, depending upon the category of muscular work, is also divided in two types. The endurance of isometric muscles (when tenseness of muscle changes without changing the metric length of muscle) is usually referred to as isometric endurance while the working ability (in duration) of isotonic muscles (when same tone tenseness is maintained by changing the length of muscles) is called the isotonic muscular endurance.

Cardiovascular Endurance (Cardiopulmonary or Circulatory– Respiratory endurance)

The ability to performance muscular work at sub maximal level by moderate contractions for a long time. Is known as cardiovascular endurance. The direct testing of cardiopulmonary endurance is made by measuring one's aerobic power or maximum oxygen uptake capacity while indirectly it is measured with the help of long duration activities like middle/long distance running, cycling of swimming.

Flexibility

The range of movement in a joint or sequence of joints, is known as flexibility. For example, touching of fingers to toes while sitting or standing without bending knees.

Freedom from obesity i.e. proper body composition

Obesity refers to the excess accumulation of fat in the body which is related to may health problems like coronary heart disease, high blood pressure, diabetes. Respiratory problems etc. freedom from obesity is measured by finding body fat content (adipose tissue) with respect to one's body weight.

Additional Five components of motor performance included in motorfitness

Muscular Power

Ability to release maximum muscular force rapidly in an explosive manner in the shortest duration, is known as muscular power, for example standing broad jump or vertical jump performance

Agility

The speed with which an individual may change his body positions or fastness in changing directions while moving is known as agility. For example, shuttle run etc.

Speed

The rapidity of muscle movement or the rate of change of body movement is known as muscular speed. Literality speed is measured by dividing distance by time in short run. However, in sports, time of sprint of 60 yd. dash itself is considered as a measure of one's speed instead of converting it in meters per second it is recorded as seconds per 60 yard or per 30 M etc.

Balance

The ability to hole the body position in comparatively less stable positions, is known as body balance. Balance is of two types static balance and dynamic balance.

Reaction Time

The interval between presentation of stimulus and the first response is called Reaction Time. In other word it is the time taken in responding to a visual or auditory stimulus. It may also be divided into two categories. Visual Reaction Time and Auditory Reaction Time.

Definations

1. Physical Fitness

It is the ability to carry out daily task with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies.

2. Strength

Strength is defined as the capacity to exert force or as the ability to do work against resistance.

3. Arm Strength

Arm strength will be defined as the capacity of a person to exert muscular force of the arm.

4. Shoulder Strength

Shoulder Strength may be defined as the capacity of a person to exert muscular force of the shoulder.

5. Agility

The ability to perform a series of explosive power moment in rapids succession in opposite direction

6. Speed

It is defined as the capacity of the individual to perform successive moment of the same pattern of a fast rate.

7. Endurance

It is the ability to allow the muscle to exert rapidly a force or static contraction over a period of time ^[3].

Objectives of the study

The allied objectives of the study are as follows:

1. To assess the physical fitness of Basketball and Handball players of Mewar University, Chittorgarh Rajasthan.
2. To compare the physical fitness of Basketball and Handball players of Mewar University, Chittorgarh Rajasthan.

Methodology

Sampling Method

The simple random sampling was applied to select the subjects for this study

Source of Data

The data pertaining to this study were collected from the players participating in Selection trial in

Selection of Subject

The researcher was select the 30 subjects 15 from each game.

Criterion Measures

The following criterion measures were chosen for testing the hypothesis.

Physical Fitness Variables measures were

- i) Strength: Arm and Shoulder strength was measured with the help of pull- ups
- ii) Abdominal Strength: Abdominal Strength was measured with the help of sit-ups
- iii) Explosive strength: Explosive strength was measured with the help of standing broad jump.
- iv) Endurance: Endurance was measured with the help of 600 yard run/walk.

A. Pull Ups

Purpose: To measure the shoulder strength

Equipments: Bar- Chalk-Powder

B. Sit ups

Purpose: To measure the abdominal strength.

Equipment: Stop watch, Mat, clean floor.

Scoring

The tester starts counting. After 60 seconds, the timer stops

the stopwatch, while the tester records the no. of correctly executed sit-ups performed by the subject in 60 seconds.

C. Standing Broad Jump

Purpose: Measure the explosive leg strength.

Equipment: Floor, long jump pit, measuring tape, marking tape.

Scoring: The distance between the starting line and the nearest point of landing provide the score of the test. The best (Maximum distance) trial is used as the finale score of the test.

D. 4. 600 Yard Run and Walk

Purpose: to measure the endurance.

Equipments: Track or marked area and stopwatch

Scoring: The time taken to run 600 yards recorded in minutes and seconds is the score of this test 600 Yard Run and Walk.

Collection of Data

The data pertaining to the study was collected by administering the tests for the selected variables.

Before Collection of data, the subjects was given a chance to practice the prescribed tests so that they should become familiar with the tests and know exactly what is to be done to ensure uniform testing condition the subjects was tested during morning and data was collected.

Statistical Method: For the analysis of data mean, standard deviation and t- ratio were used to compare the physical fitness components of Basketball and handball players, the level of significant was setup at 0.05.

Formula for mean, standard deviation and t- ratio are as below.

$$M = \frac{\sum fX}{N}$$

$$S.D = \sqrt{\frac{\sum fX^2}{N}}$$

$$T\text{-Test} = \frac{x_1 - x_2}{\sqrt{\frac{(SD_1)^2}{n_1 - 1} + \frac{(SD_2)^2}{n_2 - 1}}}$$

Analysis of the data and results of the study

The purpose of this study was to compare the physical fitness components and their relationship with performance of Basket ball and hand ball players.

The data collected quantitatively on differed test of physical fitness variables by AAHPER test. To find out the significant difference among the selected variables of basketball and Handball players as the subjects were selected thirty 15 from each game by applying random sampling method

Level of Significance

To test the hypothesis, the level of significant was set at 0.05 level of confidence which was considered adequate and reliable for the purpose of this study.

Finding

The data collected on 30 subjects was Analyzed by Applying 't' test to compare physical fitness components of basket ball and hand ball players with their performance.

Table 1: Showing Comparison between Basket Ball and Hand Ball Players in Pull-ups

Group	Mean	SD	T-ratio
Handball	14.46	2.06	1.92
Basketball	16	2.19	

N = 30

From the above table it is observed that the mean of handball and basketball is 14.46 and 16 and the t-ratio was statistically analyzed as ($t = 1.92$). Which was not significant at 0.05 level of significance, value is (2.160).

Table 2: Showing Comparison between Basket Ball and Hand Ball Players in sit-ups

Group	Mean	SD	T-ratio
Handball	25.93	3.51	0.78
Basketball	25.06	2.26	

N = 30

From the above table it is observed that the mean of handball and basketball is 25.93 and 25.06 and the t-ratio was statistically analyzed as ($t = 0.78$). Which was not significant at 0.05 level of significance, value is (2.160). Thus the hypothesis was rejected.

Table 3: Showing Comparison between Basket Ball and Hand Ball Players in standing broad jump

Group	Mean	SD	T-ratio
Handball	1.48	0.16	4.4
Basketball	1.7	0.11	

N = 30

From the above table it is observed that the mean of handball and basketball is 1.48 and 1.7 and the t-ratio was statistically analyzed as ($t = 4.4$). Which was significant at 0.05 level of significance, value is (2.160). Thus the hypothesis was accepted.

Table 4: Showing Comparison between Basket Ball and Hand Ball Players in 600/yard run and walk

Group	Mean	SD	T-ratio
Handball	2.52	1.36	0.13
Basketball	2.57	0.32	

N = 30

From the above table it is observed that the mean of handball and basketball is 2.52 and 2.57 and the t-ratio was statistically analyzed as ($t = 0.13$). Which was not significant at 0.05 level of significance, value is (2.160). Thus the hypothesis was rejected.

Discussion and findings

The present study deals with the comparative study of selected physical fitness components of Basketball and Handball players. Their range of age is between 18-28 years.

- The hypothesis of the present study was that there would be significant difference in strength between basketball and handball players, as t test is calculated as 1.92 and the level of significance was 0.05. Which was not significant so the hypothesis was rejected.
- The hypothesis of the present study was that there would be significant difference in abdomen strength between basketball and handball players, as t test is calculated as 0.78 and the level of significance was 0.05. Which was not significant so the hypothesis was rejected.
- The hypothesis of the present study was that there would

be significant difference in explosive strength between basketball and handball players, as t test is calculated as 4.4 and the level of significance was 0.05. Which was significant so the hypothesis was accepted.

- The hypothesis of the present study was that there would be significant difference in endurance between basketball and handball players, as t test is calculated as 0.13 and the level of significance was 0.05. Which was not significant so the hypothesis was rejected.

The present study deals with comparison of physical fitness between Handball and Basketball players.

Summary

- Physical Fitness:** It is the ability to carry out daily task with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies.
- Strength:** Strength is defined as the capacity to exert force or as the ability to do work against resistance.
- Arm Strength:** Arm strength will be defined as the capacity of a person to exert muscular force of the arm.
- Shoulder Strength:** Shoulder Strength may be defined as the capacity of a person to exert muscular force of the shoulder.
- Agility:** The ability to perform a series of explosive power moment in rapids succession in opposite direction.
- Speed:** It is defined as the capacity of the individual to perform successive moment of the same pattern of a fast rate.
- Endurance:** It is the ability to allow the muscle to exert rapidly a force or static contraction over a period of time.

Conclusion

The following conclusions drawn from the study

- There was no statistically significant effect of strength between basketball and handball players.
- There was no statistically significant effect of abdominal strength between basketball and handball players.
- There was statistically significant effect of explosive strength between basketball and handball players.
- There was no statistically significant effect of endurance between basketball and handball players.

Recommendations

It is recommended that:

- A similar study could be done with subjects belonging to different age group other than those employed in this study.
- A similar study could be investigated among the students at two different universities.
- A comparative study could be done among other educational faculties.
- A similar study could be done at higher-level like state, National.

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