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## **A COMPARATIVE STUDY ON HEALTH RELATED PHYSICAL FITNESS AND BMI OF HANDBALL AND VOLLEYBALL INTERCOLLEGIATE MALE AND FEMALE PLAYERS OF RANI CHANNAMMA UNIVERSITY**

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**Abstract:-**The purpose of this study was to find out health related physical fitness of Handball and Volleyball players of Rani Channamma University Intercollegiate male and female players. The subject taken for study was fifty handball and fifty volleyball players of Rani Channamma university intercollegiate male and female players. The age of the subject ranged between 18 to 28. The data collected from these tests were statistically analyzed to find out the deference in health related physical fitness among Rani Channamma university intercollegiate handball and volley ball male and female players. Quality measurement with standard equipment for balance, bent knee sit-up's, push up's, chin-up's/flexed arm hang. The all the five items were tested accordingly to event after the given break.

The significant of mean difference between the Handball and Volleyball players means and standard deviation were analyzed by using the "t" ratio and the analysis of co-variance level. In the past several international norms have been estimate and used international athletes in analyzing this of AAHPER health related physical fitness. This was motivated the investigator to take up a study for estimating the various health related physical fitness components of two groups of students to analyze and compared the fitness level.

**Keywords:**Health Fitness, And Bmi, Volleyball, Handball.

### **INTRODUCTION**

Health related physical fitness could be defined as a scientific body of positive effects regular and vigorous exercises with the prevention of degenerative diseases such a coronary heart diseases, obesity and various musculoskeletal disorders. The following findings of the researchers support the need for habits related physical fitness.

### **COMPONENTS OF HEATH RELATED PHYSICAL FITNESS:**

1. Cardio vascular fitness
2. Body composition
3. Flexibility
4. Muscular strength
5. Muscular endurance

### **BODY MASS INDEX (BMI)**

The body mass index (BMI), or Quetelet index, is a measure for human body shape based on an individual's weight and height. BMI provided a simple numeric measure of a person's thickness or thinness, allowing health professionals to discuss overweight and underweight problems more objectively with their patients. However, BMI has become controversial because many people,

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including physicians, have some to rely on its apparent numerical authority for medical diagnosis, but that was never the BMI's purpose it is meant to be used as a simple means of classifying sedentary (physical inactive) individuals, or rather populations, within an average body composition. For these individuals the current value settings are as follows.

### **HANDBALL**

Hand ball is a dynamic, popular and exciting sport that requires athleticism, strength and stamina, great fitness and most of all, team work. It is a sport where players are encouraged to be athletic, be flamboyant and inventive, and above all, work together as a team, it is one of the most popular sports in the world. Handball is a very fast, dynamic and exciting game that utilizes movements of all the world's sports. Handball is believed to be one of humanity's oldest games. Some historians speculate that it predates soccer since humans have always been better at manipulating objects with their hands than with their feet. There is strong evidence that the ancient Greeks and Romans played games that could be considered precursors to modern handball. The Greek's game was called urania. As depicted in Homer's Odyssey, it employed a ball made out of purple wool. Later the Romans played harpaston, in which competitors threw a ball over a line. There is also evidence that games similar to handball were played in Greenland, Egypt and medieval Europe. One of these sports, played in Germany, was called fangballspiel, which translates to "catch ball game" (Singh, 1984).

### **VOLLEYBALL**

Volleyball, an extremely popular team sport, belongs to a group of receiving sports played on teams. Without coming into direct physical contact with the opposing team, each side tries to put the ball into the opponents' court in such a manner that it falls to the floor or cannot be returned over the net. The ball may be played a maximum of three on each team before it must be played into the opponents' court. Faults result in points being awarded or change in service. The rotation of players clockwise to the next position when they have regained the service is essential; it ensures that each player on a team plays all positions on the floor and prevents specialization in any one position in offence and defence.

The main purpose of the study was to compare the health related fitness of the Rani Channamma University intercollegiate handball and volleyball men and women players. The study was restricted to Rani Channamma University intercollegiate handball and volleyball male and female players. The study was delimited to the 50 handball and 50 volleyball male and female players. The age of the players was limited to 18 to 28. The AAHPER Health related fitness test is selected to assess the fitness of intercollegiate players. The body mass index will be used to measure the body fat condition of the player. The study is confined to the following fitness variables.

- ❖ Balance
- ❖ Muscular Strength
- ❖ Flexibility
- ❖ Body Composition
- ❖ Muscular Endurance
- ❖ Cardio Vascular Endurance

When testing the subjects the meteorological variation such as Air, Temperature, Atmosphere, Pressure, Relative Humidity etc. were not taken. This would be a delimitation for the study. A physiological factor such as Diet, Nutrition, Rest and Practice were not taken into consideration is another constraint of the study. The subjects or players' socio-economic status, habits and family backgrounds were not taken into consideration. This would be a delimitation for the study. It was hypothesized that there is no significant difference between the health related physical fitness of male volleyball and handball players. It was hypothesized that there is no significant difference between the health related physical fitness of female volleyball and handball players. The result of this study will help physical education teachers, coaches & trainers to use the fitness

activities to develop their Volleyball & Handball personality of the players. The study may provide criteria for selecting players to build up a team. This study will help the coaches & physical education teachers to plan examining system and schedule for players. The result and findings of this study provide criteria for selecting potential players of respective games and sports.

### **THE DEFINITION AND EXPLANATION OF TERMS**

Health related physical fitness could be defined as a scientific body of positive effects regular and vigorous exercises with the prevention of degenerative diseases such a coronary heart diseases, obesity and various musculoskeletal disorders. The following findings of the researchers support the need for habits related physical fitness. Health related physical fitness for this study is the performance of handball and volleyball players in AAHPER health related physical fitness test.

Cardio Vascular Fitness may be defined as the ability of heart and lungs take in and to transports adequate amount of oxygen to the working muscle for activities that involves large muscle masses, to be performed over a long period of time.

Body Composition is used to describe the percentages of body fat. Because muscular tissue takes up less space in our body than fat tissue, our body composition, as well as our weight, determines leanness. Two people of equal height and body weight may look completely different from each other because they have a different body composition.

Flexibility is the ability of muscle to perform movement with large amplitude (range of motion). It also refers to functional capacity of a joint to move through a normal range of motion. It is specific to a given joint & is actually more dependent upon the musculature surrounding a joint than they actually more dependent upon the musculature surrounding a joint than the actual body structure of the joint itself.

Muscular Strength is the amount of force that can be produced by a muscle in a single contraction.

Muscular Endurance is the muscular endurance may be defined as “the ability of muscle to maintain a certain level of tension or to repeat identical movements or pressure over the maximal period of time with one’s maximal efforts”.

### **METHODOLOGY**

The main purpose of this study was to compare health related fitness of Rani Channamma University Intercollegiate Handball and Volleyball male and female players.

### **SAMPLING TECHNIQUE**

Simple purposive sampling technique was used to collect the data. The subjects were identified for the study was the players playing at Rani Channamma University intercollegiate handball and volleyball tournaments. The players representing their respective colleges in the respective games. The study was intended to know the sportspersons health related physical fitness levels and hence the purposive sampling technique was used to collect the data. The sample size was 25 each in men and women handball and volleyball games. All together 100 samples were taken randomly to assess health related physical fitness of the subjects.

These students were tested their health related physical fitness with the help of following tests and predicted fitness component of each test are given below:

- |                              |   |                                 |
|------------------------------|---|---------------------------------|
| 1. Sit And Reach Test        | - | Trunk and Hip Flexibility       |
| 2. Single leg balance        | - | Balance                         |
| 3. Push up                   | - | Muscular strength and endurance |
| 4. Bent knee sit-up          | - | Abdominal endurance             |
| 5. Pull up / flexed arm hang | - | Muscular endurance              |
| 6. BMI                       | - | Body composition (per cent fat) |

**The descriptions of test are given as follows:**

**1. Sit and Reach Test:-**

**Purpose:** To measure flexibility of lower back and hamstrings by reaching as far as possible with the fingertips.

**Equipment:** This assessment requires a sturdy box approximately 12 inches high (fourfold mat may be stacked to 12 inches in lieu of the box). A measuring scale (meter stick) is placed on top of the box with 23 centimeters at the level of the feet.

**Testing:** The student removes his/her shoes and sits on the floor with knees fully extended, feet shoulder-width apart and soles of feet held flat against the end of the box (or mats) With hands on top of each other, palms down, and legs held flat, the student reaches along the measuring line as far as possible. After three practice reaches, the fourth reach is held while the distance is recorded. The legs must remain straight, soles of feet against the box, and fingertips of both hands should reach evenly along the measuring line.

**Scoring:** Scores are recorded to the nearest centimeter.

**2. Bent Knee Sit-Up:-**

**Purpose:** The curl up test measures abdominal muscular strength and endurance of the abdominals and hip-flexors, important in back support and core stability.

**Equipment required:** flat, clean, cushioned surface, stopwatch, recording sheets, and pen.

**Procedure:** Described here are the commonly used methods and some general guidelines. The subject lies on a cushioned, flat, clean surface with knees flexed, usually at 90 degrees (Figure 3.2). Some techniques may specify how far the feet are from the buttocks, such as about 12 inches. A partner may assist by anchoring the feet to the ground. The position of the hands and arms can affect the difficulty of the test. They are generally not placed behind the head as this encourages the subject to stress the neck and pull the head forward. The hand may be placed by the side of the head, or the arms crossed over the chest, reaching out in front.

Some protocols use curl up strips or other marks on the ground to slide the hands along and indicate how much to curl up. The subject raises the trunk in a smooth motion, keeping the arms in position, curling up the desired amount. The trunk is lowered back to the floor so that the shoulder blades or upper back touch the floor.

**3. The Pushup Test:-**

**Purpose:** Strength and endurance in your chest, shoulders, and triceps.

**Equipment required:** A stop watch or timer that can measure one full minute; a friend to help keep count and time you (optional).

**Procedure:** Men will assume a traditional pushup position and females can use the modified pushup position (on knees). When the pushups start, so does the clock! Press yourself up with arms fully extended and lower yourself back until your chest is three inches from the floor (but do not touch your body to the floor). Repeat as many times as you can in one minute. You may rest only in the “up” position if necessary.

**4. Balance Test:-**

**Purpose:** To measure the balance

**Equipment required:** Flat, non-slip surface, stopwatch

**Procedure:** the person stands on one leg for as long as possible. Give the subject a minute to practice their balancing before starting the test. The timing stops when the elevated foot touches the ground or the person hops or otherwise loses their balance position. The best of three attempts is recorded. Repeat the test on the other leg.

**Scoring:** Time the total length of time person can stay in the balance position.

#### 5. Pull up / chin up test:-

**Purpose:** This test measures upper body muscle strength and endurance.

**Equipment required:** Horizontal overhead bar, at an adequate height so that the participants can hang from with arms fully extended and feet not touching the floor. (See pull-up bars).

**Procedure:** Grasp the overhead bar using either an overhand grip (palms facing away from body) or underhand grip (palms facing toward body), with the arms fully extended. The subject then raises the body until the chin clears the top of the bar, then lowers again to a position with the arms fully extended. The pull-ups should be done in a smooth motion. Jerky motion, swinging the body, and kicking or bending the legs is not permitted. As many full pull-ups as possible are performed.

**Scoring:** The total number of correctly completed pull-ups is recorded. The type of grip should also be recorded with the results.

#### 6. Body mass index:-

**Purpose:** to measure body fat percentage

**Equipment required:** scales and stadiometer as for weight and height.

**Procedure:** BMI is calculated from body mass (M) and height (H).  $BMI = M / (H \times H)$ , where M = body mass in kilograms and H = height in meters. The higher the score usually indicating higher levels of body fat.

**Scoring:** Use the table below to determine your BMI rating. The table shows the World Health Organization BMI classification system. The rating scale is the same for males and females. You can also use the reverse lookup BMI table for determining your ideal weight based on height.

| Category                              | BMI range – kg/m <sup>2</sup> |
|---------------------------------------|-------------------------------|
| Very severely underweight             | less than 15                  |
| Severely underweight                  | from 15.0 to 16.0             |
| Underweight                           | from 16.0 to 18.5             |
| Normal (healthy weight)               | from 18.5 to 25               |
| Overweight                            | from 25 to 30                 |
| Obese Class I (Moderately obese)      | from 30 to 35                 |
| Obese Class II (Severely obese)       | from 35 to 40                 |
| Obese Class III (Very severely obese) | over 40                       |

**THE DATA:-**

The data collected was analyzed with the help of t- test to know the difference between the male and female handball and volleyball players mean scores. The graphical representations of differences in mean scores were also provided for clarity of the reader.

**Table 1.1 COMPARISONS OF HEIGHT, WEIGHT AND BODY MASS INDEX OF HANDBALL AND VOLLEYBALL MALE PLAYERS**

| <b>Variables</b> | <b>Correlation</b> |
|------------------|--------------------|
| Height           | 0.00               |
| Weight           | 0.24               |
| Body Mass Index  | 0.08               |

The above table shows that there is no correlation in height but when compared to weight and body mass index there is little correlation between handball and volleyball male players.

**Table 1.2. COMPARISON OF HEIGHT, WEIGHT AND BODY MASS INDEX OF HANDBALL AND VOLLEYBALL FEMALE PLAYERS**

| <b>Variables</b> | <b>Correlation</b> |
|------------------|--------------------|
| Height           | 0.07               |
| Weight           | 0.27               |
| Body Mass Index  | 0.94               |

The above table shows that in height and weight there is little correlation between handball and volleyball female players. The body mass index had almost perfect correlation (.94) between female players. This speaks of equal body weight and height between these players

**TOTAL FITNESS**

A careful examination of table's show the total health related physical fitness of each component of Handball and Volleyball male and female players such as Balance, Push Up's, Pull Up's Or Flexed Arm Hang, Bent Knee Sit Up's, Sit and Reach. Among the health related physical fitness components the hand ball players superior in male and volley ball players superior in female players.

**CONCLUSIONS:-**

The following conclusions may be drawn from the result presented in the previous chapters, on the basis of the finding of the study. The male handball players had better health, related, physical, and fitness. Whereas the female the volley ball players had better fitness. The balance variable was significant in respect of male volleyball players than handball players. The muscular endurance variable was significant in respect of female volleyball players than handball players. The BMI was significant correlation between female handball and volleyball players.

The total fitness between handball players and volleyball players were significant become and the fact that both the players will not differ much in their performance level. The samples drawn from the study indicates only handball male players got better performance in pull-ups, pushups, sit

and reach when compared to volley ball players. In female the volley ball players got better performance in balance, pushups, bent knee sit ups, sit and reach test when compared to hand ball players.

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