



DIFFERENT FITNESS ATTRIBUTES OF ADOLESCENT BADMINTON AND VOLLEYBALL PLAYERS - A COMPARATIVE STUDY

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ABSTRACT: The purpose of the study was to compare the physical fitness variable of Badminton and volleyball male Players. To fulfill the objective of the study, (15 Badminton male players and 15 volleyball male players) subjects were selected from south 24 parganas District of West Bengal State who was attending district level competition. The data were collected in different clubs. The age of the selected subjects ranged from 15 to 18 years. (Pull ups, sit ups, 4*10m shuttle run, 50m run, 600m run) were used to measure the selected physical fitness variables of the players. In order to analyze the data t-test was used to analyze the data and investigator observed the significant difference between Badminton and Volleyball Players of muscular strength, muscular endurance, speed, cardio-vascular endurance and significant difference of agility

Keywords: Badminton; Volleyball; Muscular Strength; Muscular endurance; Speed; Agility; Cardio-vascular Endurance.

1. INTRODUCTION

Physical fitness has been of great significance in the lives of human beings from times immemorial. In the pre-historic times, physical fitness was the key element for the survival of a human being. People during those times were confronted with hostile environment and only fit individuals could survive. Hence survival of the fittest was the dictum. Even the civilization of Sparta, Athens and Rome in the history of the world has stressed physical fitness or physical training as an important objective of the educational programme [1].

The complex nature of physical fitness can be best understood in terms of its components such as cardiovascular endurance, strength, flexibility, speed, agility and muscular endurance. In addition to these components of physical fitness there are many other factors which contribute to physical fitness including heredity, living standard, nutrition, hygienic conditions, environmental and climate factors etc. [2].

Physical fitness is, in a very broad sense, determined by the individual's capacity for optional work and motor and sport performance [3]. 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 vigor and alertness without undue fatigue, with ample energy to enjoy leisure time pursuits, and to meet unforeseen emergencies" [4]. 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 component of 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. However, Kansal (1981) defines physical fitness by the group of five components, namely muscular strength, muscular endurance, cardiovascular endurance, freedom from obesity and flexibility. It is important to mention here that some of the experts, Clarke and Clarke (1987) and AAHPERD (1980) call such fitness test which includes the measurement of percentage body fat, as health related physical fitness test [5-7].

Physical fitness is often referred to as organic vigor or vitality the physical elements of behavior that permits the person to be active". The greater the physical fitness, the greater will be physical endurance and the precision of movements. The greater the physical fitness, the longer a person will be able to keep going; he will be able to perform more efficiently and at greater speed and to recover faster from fatigue. Poor health and lowered physical capacity reduce one's ability to perform mental task.

Physical fitness is an inseparable part of sports performance and achievements. The quality of its utilization value is directly proportional to the level of performance. That means the greater the level of fitness, the greater will be the ability of a person to attain higher level of performance. Players are required to have good physical fitness that will enable successful performance at the competitive level. The sport specific technical skills in sports are predominant factors. The physical fitness of a player however can be a decisive determinant of success during competition [8]. A player would need to develop higher levels of the basic physical qualities to be able to compete effectively. Chin et al (1995) recommend that if a player wants to achieve reasonable success in competitions at higher level, improvements in physical fitness needs to be emphasized in addition to skill training. In sport theory and practice, the level of motor abilities is the key factor in majority of sports achievements [9]. The scientists collected the data of athlete physical characteristics and fitness, and based on the data, they provided the profiles of the top- ranked athletes in specific sports events [10-13].

Volleyball players require well-developed muscular strength, power and endurance, speed, agility, and flexibility, and have a high level of jumping ability, fast reaction time and swift movements [14]. Lower body power, speed, and agility are important indicators of volleyball performance [15].

Physical fitness of a player depends on the nature of his game and also external conditions. There are a number of fitness elements that need to be developed. Such as speed, endurance, agility and strength to correct and Main tenance of body weight. Badminton and lawn-tennis both are almost



similar games. A complete badminton player should possess that agility of an acrobat, the power of a race horse, the killer instinct of a panther as well as like a lawn-tennis player. Some of the standards the fit player attain to meet the demands of the games are strength, power, speed etc. fitness components. Court and field games like Badminton, lawntennis, Table-Tennis, Kabaddi Squash, Football, Volleyball help in developing strength and speed of the players while other games like boxing, gymnastic, wrestling etc. developing agility and power of its players better [16-18].

1.2 Purpose of the study

Purpose of this study was to compare the selected physical fitness variables between Badminton and Volleyball players.

2. METHODOLOGY

2.1 Selection of subject

Total 30 subjects were selected for this study. 15 Badminton and 15 Volleyball players from various club in south 24 parganas, west Bengal, India, were taken as sample. They were participated in district level competition. Their age ranged between 15-18 years.

2.2 Selection of variables and their criterion measures

Table 1 represents the components physical fitness variables which were selected for the present study and were measured.

Table-1

| Sl. no | variables | units | Criterion measures |
|--------|-----------|-------------------|---------------------------|
| 1. | Pull ups | Max. performed | muscular strength |
| 2. | Sit ups | Scores/60 seconds | muscular endurance |
| 3. | agility | seconds | agility |
| 4. | 50m run | seconds | speed |
| 5. | 600m run | seconds | cardio-vascular endurance |



2.3 Statistical procedure

The data was analyzed and compared with the help of descriptive statistics and independent, "t" test. The level of significance to the test, "t" ratio was fixed at 0.05 levels which was considered to be appropriate for the purpose of the study.

3. RESULT AND DISCUSSION

Table: 02 : Describe mean and standard deviation of the study population –

| Sl. no | components | units | Badminton | Volleyball |
|--------|---------------------------|-------------------|------------|-------------|
| 1. | Muscular strength | Max. performed | 6.73 ±1.03 | 7.53 ±1.06 |
| 2. | Muscular endurance | Scores/60 seconds | 40.8 ±2.83 | 39.33 ±2.28 |
| 3. | agility | seconds | 9.51±0.40 | 9.95±0.37 |
| 4. | speed | seconds | 7.03±0.40 | 7.26±0.39 |
| 5. | Cardio-vascular endurance | seconds | 1.53 ±0.03 | 1.55 ±0.02 |

Table 2 depicts that the mean and standard deviation values of Badminton and Volleyball players. There values were recorded as Badminton player's muscular strength 6.73 ±1.03, muscular endurance 40.8 ±2.83, agility 9.51±0.40, speed 7.03±0.40, cardio-vascular endurance 1.53 ±0.03 and muscular strength 7.53 ±1.06, muscular endurance 39.33 ±2.28, agility 9.95±0.37, speed 7.26±0.39, cardio-vascular endurance 1.55 ±0.02 and respectively

Comparison analysis of physical fitness variables between Badminton and Volleyball players

Table 3: Comparison analysis of muscular strength between Badminton and Volleyball players

| Group | Number | Mean | SD | "t" Value |
|------------|--------|------|------|-----------|
| Badminton | 15 | 6.73 | 1.03 | 1.15 |
| Volleyball | 15 | 7.53 | 1.06 | |

t 0.05 (df=28) 2.04 . Not significant at 0.05 level

Table 4: Comparison analysis of muscular endurance between Badminton and Volleyball players

| Group | Number | Mean | SD | "t" Value |
|------------|--------|-------|------|-----------|
| Badminton | 15 | 40.8 | 2.83 | 1.56 |
| Volleyball | 15 | 39.33 | 2.28 | |

t 0.05 (df=28) 2.04 Not significant at 0.05 level



Table 5: Comparison analysis of agility between Badminton and Volleyball players

| Group | Number | Mean | SD | "t" Value |
|------------|--------|------|------|-----------|
| Badminton | 15 | 9.51 | 0.40 | 2.39* |
| Volleyball | 15 | 9.95 | 0.37 | |

t 0.05 (df=28) 2.04 * significant at 0.05 level

Table 6: Comparison analysis of speed between Badminton and Volleyball players

| Group | Number | Mean | SD | "t" Value |
|------------|--------|------|------|-----------|
| Badminton | 15 | 7.03 | 0.40 | 1.15 |
| Volleyball | 15 | 7.26 | 0.39 | |

t 0.05 (df=98) 2.04 Not significant at 0.05 level

Table 7: Comparison analysis of cardio-vascular endurance between Badminton and Volleyball players

| Group | Number | Mean | SD | "t" Value |
|------------|--------|------|------|-----------|
| Badminton | 15 | 1.53 | 0.03 | 0.15 |
| Volleyball | 15 | 1.55 | 0.02 | |

t 0.05 (df=28) 2.04 Not significant at 0.05 level

The perusal of table 3 indicates that the mean and standard deviation values for muscular strength of Badminton and Volleyball players were recorded as 6.73 ± 1.03 and 7.53 ± 1.06 respectively. There have found no significance difference between badminton and volleyball players in muscular strength. Mean values shows that volleyball players are slightly better than badminton players in muscular strength.

The analysis of table 4 shows that the mean and standard deviation value for muscular endurance of Badminton and Volleyball players were recorded as 40.8 ± 2.83 and 39.33 ± 2.28 respectively. There have found no significance difference between badminton and volleyball players in muscular endurance. Mean value indicates that badminton players are slightly better than volleyball players.

The analysis of the table 5 indicates that the mean and standard deviation values for agility of Badminton and Volleyball players were recorded as 9.51 ± 0.40 and 9.95 ± 0.37 respectively. There have found significance difference between badminton and volleyball players in agility. Mean shows that badminton players are better than volleyball players.

Perusal of the table 6 shows that the mean and standard deviation values for speed of Badminton and Volleyball players were recorded as 7.03 ± 0.40 and 7.26 ± 0.39 respectively. There have found no significance difference between badminton and volleyball players. Mean indicates that badminton players are slightly better than volleyball players.

The analysis of the table 7 indicates that the mean and standard deviation values for cardio-vascular endurance of Badminton and Volleyball players were recorded as 1.53 ± 0.03 and 1.55 ± 0.02 respectively. There have found no significance difference between Badminton and Volleyball players. Mean values shows that badminton players have better than volleyball players.

This study was aimed to the find out comparative relationship of physical fitness variables between district level Badminton and Volleyball players. There are various factors that influence of physical fitness. The results of this study showed that the Volleyball players are slightly better than Badminton players of muscular strength. Badminton players are slightly better than Volleyball players of muscular endurance. Badminton players are better than Volleyball players of agility. Badminton players are slightly better than Volleyball players of speed. Badminton players are slightly better than Volleyball players of cardiovascular endurance

Graphical representation of deference in mean for Badminton players and Volleyball players in physical fitness

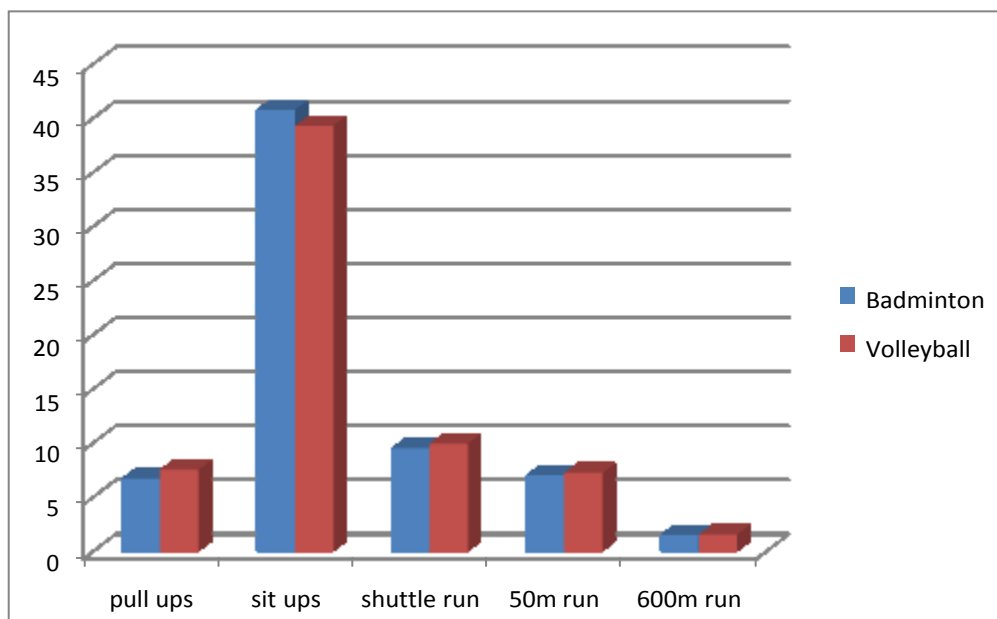


Fig.1



4. CONCLUSION:

According to the findings of this study, it can be concluded that-

- Volleyball players are slightly better than Badminton players of muscular strength.
- Badminton players are slightly better than Volleyball players of muscular endurance.
- Badminton players are better than Volleyball players of agility..
- Badminton players are slightly better than Volleyball players of speed.
- Badminton players are slightly better than Volleyball players of cardiovascular endurance.

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REFERENCES

1. J.E. Nixon, A.E. Jewett, and E.W. Nixon, (1969) An introduction of physical education. Philadelphia: W.B, Saunders Company, 196.
2. J.F. Sallies, M.F. Hovel, and C.R. Hofstadter, Predictors of adoption and maintenance of vigorous physical activity in men and women, *Preventive Medicine*, 21 (1992) 237- 251.
3. P.O. Astrand and K. Rodahle (1986) Textbook of work physiology: Physiological basis of exercise (3 ed.). New York: Macmillan.
4. D.H. Clarke (1971) Physical motor tests in the Medford boys- growth study Prentice- Hall Englewood Cliffs- New Jersey, U.S.S
5. D.K. Kensal, (1981) A study of age changes in physique and body composition in males of two communities of Punjab, Ph.D. thesis, Punjabi university, Patiala.
6. D.H. Clarke and H.H. Clarke (1987) Application of measurement to physical education. Prentice- Hall Englewood Cliffs- New Jersey, U.S.S.
7. American Alliance for Health, Physical Education, Recreation and Dance (1980) Health related physical fitness test manual. AAHPERD, Reston, VA, U.S.A.
8. G. Smekal, S.P. von Duvillard, C. Rihacek, R. Pokan, P. Hofmann, R. Baron, H. Tschan, N. Bachl, A physiological profile of tennis match play. *Medicine and Science in Sports and Exercise*, 33 (2001) 999-1005.
9. J. Kasha, (2003) Diagnostics of motor prerequisites, Trenching university Alexandria, Institute of natural and humane sciences, 127-128.
10. S.J. Fleck, Body Composition of elite American athletes, *The American Journal of Sports Medicine*, 11 (1983) 396-403.
11. J. Pull, S. Case, S. Fleck and P.V. Handel, Physical and physiological characteristics of



- elite volleyball players, *Research Quarterly*, 53 (1982) 257-262.
12. J.C. Yang, and C.W. Lee, Physique, physical characteristics, body composition analyses in various sport athletes - focusing 88 Olympics national team athletes, *Korean Journal of Physical Education*, 27 (1988) 285-312.
 13. T.G. William, G.O. Johnson, T.G. Fagot, G.D. Tharp and R. W. Hammer, Body composition and somatotype characteristics of junior Olympic athletes, *Medicine and Science in Sports*, 13 (1981) 332-338.
 14. M.K. She, Influence of the new competition rule on volleyball and development of techniques and tactics, *Fujian Sports Science and Technology*, (1999) 18-20.
 15. J.D. Vescovi, and M.R. McGuigan, Relationships between sprinting, agility, and jump ability in female athletes, *Journal of Sports Sciences*, 26 (2008) 97-107.
 16. D.K. Kensal, (2008) Applied measurement, evaluation and sports selection. Sport and Spiritual Science Publication. Jeeves Park, New Delhi.
 17. J.P. Vera (2011) Statistical Methods for Sports and Physical Education (Tata McGraw Hill Education Private Ltd).
 18. C.E. Will goose, (1969) The Curriculum in Physical Education, Englewood Cliffs, N.J: Prentice hall Inc., 26.
