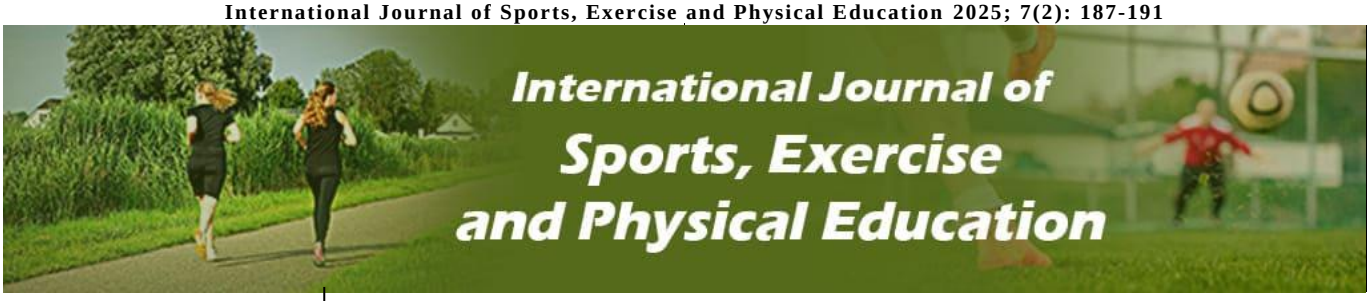

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Comparison of physical fitness variables of volleyball and basketball female players of Uttar Pradesh

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Abstract
In the present study, an attempt has been made to compare strength, power, agility and speed of physical fitness component between college level volleyball and basketball female players of Uttar Pradesh. The study was carried out on total 100 female players (50 from volleyball and 50 from basketball) in the age group of 18-25 years. The subjects were selected from different colleges of Uttar Pradesh. The data was collected by use of various physical fitness tests. The data was analyzed and compared with the help of SPSS in which arithmetic mean, standard deviation, t-test were employed. Volleyball and Basketball female players strength mean value (10 pull ups & 11pull ups) was found not significantly difference. The mean value of Volleyball and Basketball female player regarding power (196cm & 148cm), agility (13.45sec & 11.45sec) and speed (10.23sec & 8.78sec) were found a significantly difference. That shows that volleyball and basketball female player have similar types of strength, volleyball female players have more power compared to basketball female players, basketball female players have more agility and speed compared to volleyball female players.

Keywords: Physical Fitness, Volleyball Female Players, Basketball Female Players, Strength, Power, Agility, Speed

Introduction
Physical fitness is a foundational component of athletic performance, particularly in dynamic and high-intensity sports such as volleyball and basketball. These sports demand a diverse range of physical attributes, including muscular strength, explosive power, agility, and speed, all of which directly influence an athlete's ability to perform at a competitive level. Understanding how these variables vary between sports can provide valuable insights for coaches, trainers, and sports scientists aiming to design sport-specific training regimens and talent identification programs.

Volleyball and basketball, while sharing some similarities as team-based court sports, differ significantly in their physiological and biomechanical demands. Volleyball emphasizes vertical explosiveness for actions such as jumping and spiking, requiring high lower-body power and muscular strength. In contrast, basketball combines vertical jumping with multidirectional movements, requiring a greater emphasis on speed, agility, and both upper- and lower-body strength for sprinting, shooting, and defensive maneuvers. These differing sport-specific demands may lead to the development of distinct physical fitness profiles among athletes.

Despite the increasing participation of female athletes in competitive sports across India, there remains a limited body of region-specific research analyzing the physical fitness attributes of female players. In the context of Uttar Pradesh—a state with growing representation in school and collegiate-level sports—comparing the fitness profiles of female volleyball and basketball players can contribute to a better understanding of athlete development within the region. This comparison is particularly important for identifying strengths and gaps in physical preparation among players, thereby informing more effective training strategies. Therefore, the present study aims to compare selected physical fitness variables—strength, power, agility, and speed—between female volleyball and basketball players from Uttar Pradesh. By highlighting key differences and similarities, this research

seeks to contribute to the body of knowledge on sport-specific fitness profiles and promote evidence-based training practices for female athletes in the state.

Objectives

To compare physical fitness variables (i.e. strength, power. agility and speed) of volleyball and basketball female players.

Hypotheses

1. There will be significant difference in strength between volleyball and basketball female players.
2. There will be significant difference in power between volleyball and basketball female players.
3. There will be significant difference in agility between volleyball and basketball female players.
4. There will be significant difference in speed between volleyball and basketball female players.

Methodology

Selection of the Subjects

One hundred college level female players were randomly selected as a subject (50 from volleyball female players and 50 from basketball female players) from Uttar Pradesh. The age group of subjects between 18 to 25 years.

Selection of the Variables

1. Strength
2. Power
3. Agility
4. Speed

Administration of the test

Strength (Pull-Ups)

Purpose: This test is used to measure the muscular strength of shoulder.

Equipment's: A wooden or metal bar approximately 1.5 inches in diameter.

Procedure: The height of the bar should be such that when the subject hangs from it with fully extends arms; his feet do not touch the ground. The subject was asked to use on overhand grasp with the palms facing away from, the body. from the hanging position, the pupil raises the body by the arms until the chain can be placed over the bar and then lower the body to a full extension hang and repeat the pull ups as many times as possible.

Scoring: The maximum number of completed pull-ups was the score of the subject.

Power (Standing Broad Jump)

Purpose: This test measures the power of legs.

Equipment's: Floor, mat or long jump pit, measuring tape.

Procedure: The subject stands behind the starting line with the feet parallel to each other. Subjects were asked to jump as farthest as possible by bending knees and swinging arms to take off for the broad jump in the forward direction. Three trials were given to each subject.

Scoring: The distance between the starting line and nearest point of landing. The best trail was used as final score.

Agility (Shuttle Run)

Purpose: This test item is used to measure the speed and coordinative ability

Equipment's: Two block of wood (2" *2" * 4") stop watch marketing powder.

Procedure: Two parallel lines were marked on the floor 10 yards or parts. The subjects were asked to start from behind one line. On the single go the stop watch was started. The subject was asked to run towards the blocks and asked to pickup one of the block and come back to the starting line. And placed the block behind the starting line, runs back and pick up the second block to be carried back across the starting line till the timer stops the watch and record that time.

Scoring: Two trails were given to each subject. The time of the better of the two trials is recorded to the nearest 10th of a second.

Speed (50 Yard dash)

Purpose: This test item is used to measure the speed of subject.

Equipment's: Stop watch, with spilt second time.

Procedure: Two lines were marked on the floor 50 yards (4 S-meter) one line act as starting line and other as the finish line. On the signal Go the subject started running at their best to reach finish line as earliest as possible or in minimum time. The signal Go was accompanied with the down word sweep of the starter's arm to give the visual signal to the timer/timers who stands at the finish line.

Scoring: The interval between the starting signal and instant subject crosses the finish line was recorded correct up to tenth of a second.

Statistical Technique

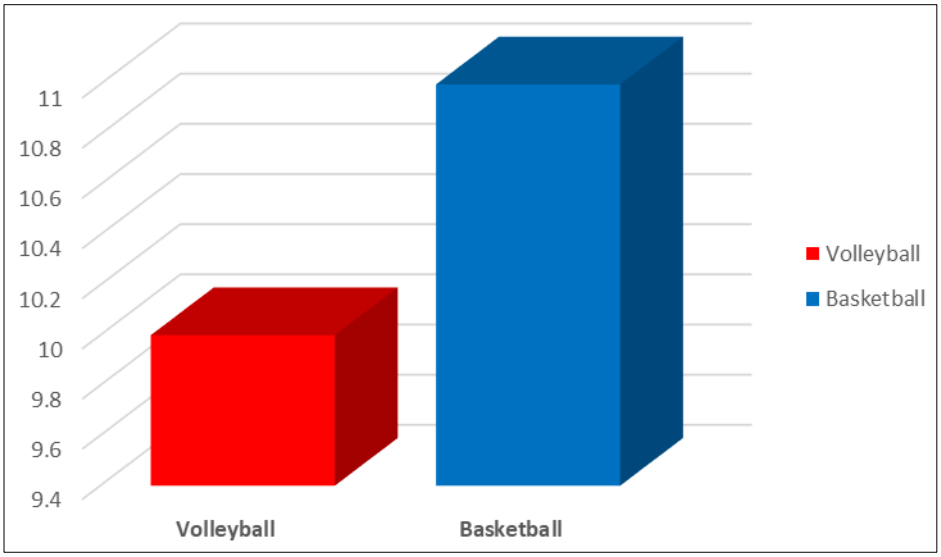
In this study, the researcher aimed to compare selected physical variables between volleyball and basketball female players. The analysis was conducted using the 't'-test with the help of SPSS, version 23. The significance of the study at 0.05 level of significant.

Analysis of Data & Result of the Study

Table 1: Comparison of Mean Values Between Volleyball and Basketball Female Players Regarding Strength (No. of Pull Ups)

Players	N	Mean	Std. Dev.	D.F.	S.E.D.	't'-Ratio	p-value
Volleyball	50	10	1.84	98	0.245	0.782	0.435 (NS)
Basketball	50	11	1.91				

(NS) = Not Significant at level of 0.05



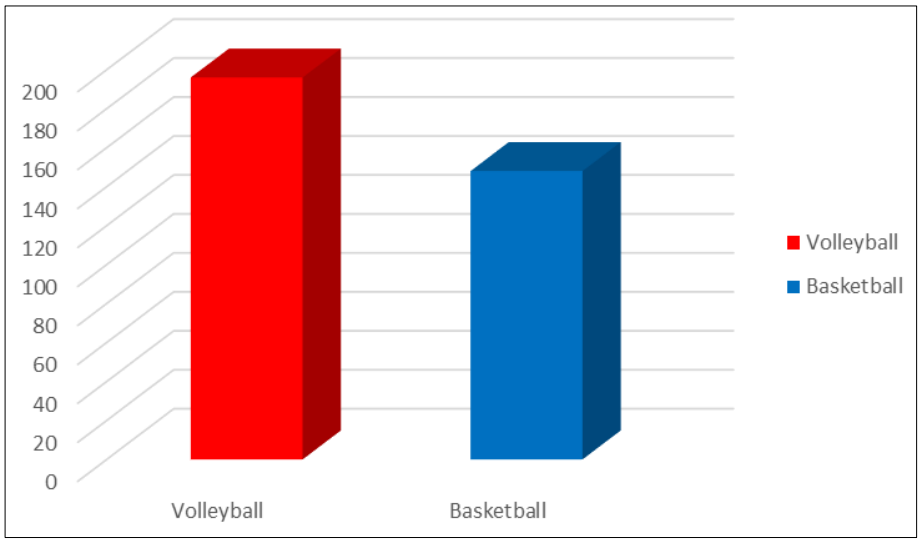
Mean Value of Strength in No. of Pull Ups

Table 1 reveals the significance of the mean difference of Volleyball and Basketball female players regarding their strength. The mean value of Volleyball and Basketball female players regarding strength were 10 and 11, respectively. The calculated 't'-value is 0.782, which is not significant at the 0.05 level of significance. So there is no significance difference in strength between Volleyball and Basketball female players. No significance difference shows that Volleyball and Basketball female players almost have same type of strength.

Table 2: Comparison of Mean Values Between Volleyball and Basketball Female Players Regarding Power (Cm.)

Players	N	Mean	Std. Dev.	D.F.	S.E.D.	't'-Ratio	p-value
Volleyball	50	196	5.45	98	0.512	2.036	0.021*
Basketball	50	148	4.92				

*Significant at 0.05 level of significance



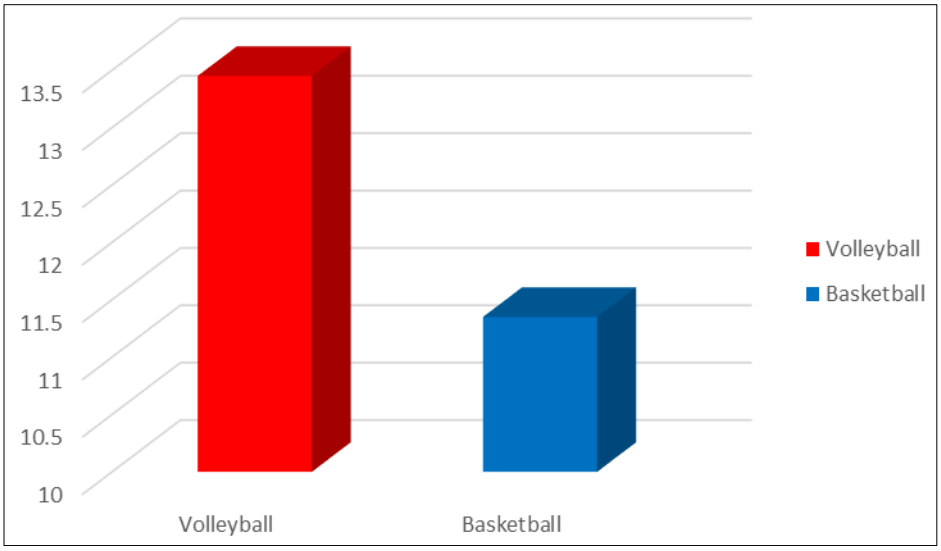
Mean value of Power in Cm.

Table 2 reveals the significance of the mean difference of Volleyball and Basketball female players regarding their power. The mean value of Volleyball and Basketball female players regarding power were 196 and 148, respectively. The calculated 't'-value is 2.036, which is significant at the 0.05 level of significance. So there is significance difference in power between Volleyball and Basketball female players. The higher mean score shows that the power of Volleyball female players is higher as compared with the power of Basketball female players.

Table 3: Comparison of Mean Values Between Volleyball and Basketball Female Players Regarding Agility (Sec.)

Players	N	Mean	Std. Dev.	D.F.	S.E.D.	't'-Ratio	p-value
Volleyball	50	13.45	3.10	98	0.378	-2.021	0.043*
Basketball	50	11.35	2.12				

*Significant at 0.05 level of significance



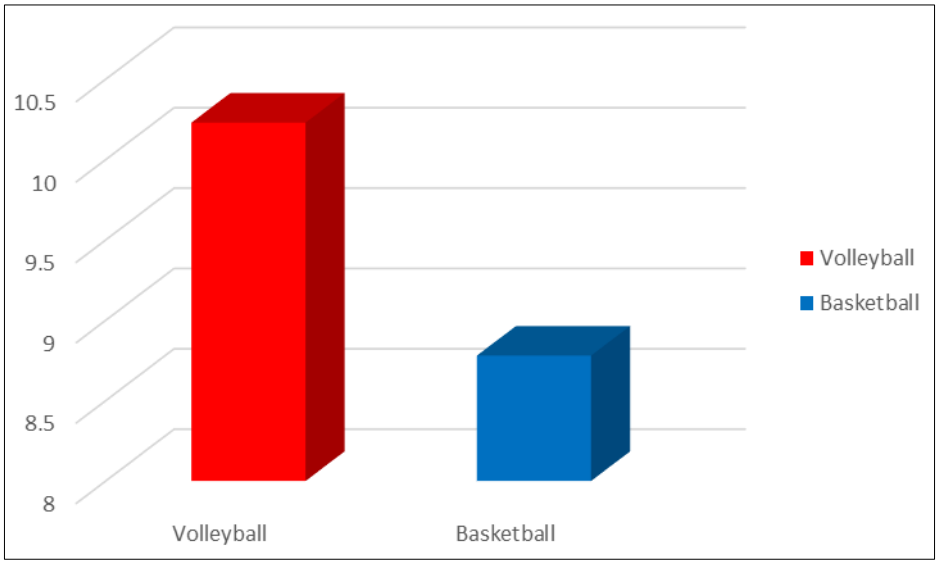
Mean Value of Agility in Sec.

Table 3 reveals the significance of the mean difference of Volleyball and Basketball female players regarding their agility. The mean value of Volleyball and Basketball female players regarding agility were 13.45 and 11.35, respectively. The calculated 't'-value is -2.021, which is significant at the 0.05 level of significance. So there is significance difference in agility between Volleyball and Basketball female players. The lower mean score shows that the agility of Basketball female players is higher as compared with the agility of Volleyball female players.

Table 4: Comparison of Mean Values Between Volleyball and Basketball Female Players Regarding Speed (Sec.)

Players	N	Mean	Std. Dev.	D.F.	S.E.D.	't'-Ratio	p-value
Volleyball	50	10.23	4.09	98	0.456	-2.039	0.027*
Basketball	50	8.78	3.07				

*Significant at 0.05 level of significance



Mean Value of Speed in Sec.

Table 4 reveals the significance of the mean difference of Volleyball and Basketball female players regarding their speed. The mean value of Volleyball and Basketball female players regarding speed were 10.23 and 8.78, respectively. The calculated 't'-value is -2.039, which is significant at the 0.05 level of significance. So there is significance difference in speed between Volleyball and Basketball female players. The lower mean score shows that the speed of Basketball female players is higher as compared with the speed of Volleyball female players.

Testing of Hypotheses

From the results

1. There will be significant difference in strength between volleyball and basketball female players, is rejected.
2. There will be significant difference in power between volleyball and basketball female players, is accepted.
3. There will be significant difference in agility between volleyball and basketball female players, is accepted.
4. There will be significant difference in speed between volleyball and basketball female players, is accepted.

Discussion of the Results

The present study compared the physical fitness components of female volleyball and basketball players with respect to strength, power, agility, and speed. The findings indicated that there was no significant difference in strength between the two groups, as both volleyball and basketball players recorded similar mean values. This suggests that upper-body strength development is relatively comparable across both sports, possibly due to the common training methods that emphasize general conditioning.

In terms of power (standing broad jump), volleyball players exhibited a significantly higher mean score than basketball players. This outcome reflects the sport-specific demands of volleyball, where explosive leg power is essential for spiking, blocking, and vertical jumping actions.

With regard to agility (shuttle run test), basketball players outperformed volleyball players, showing a significant difference in performance. This can be explained by the dynamic nature of basketball, which requires rapid changes of direction, quick lateral movements, and continuous defensive and offensive transitions.

Similarly, in speed (50 m dash test), basketball players demonstrated significantly better results compared to volleyball players. The faster sprint times highlight the importance of repeated high-intensity sprints in basketball for fast breaks, defensive recoveries, and transition play.

Overall, these findings confirm that while both groups develop strength similarly, volleyball players are more specialized in explosive power, whereas basketball players excel in agility and speed due to the movement patterns and physiological demands of their respective sports.

Conclusion

The study concludes that:

- **Strength:** No significant difference exists between female volleyball and basketball players.
- **Power:** Volleyball players possess significantly greater explosive leg power than basketball players.
- **Agility and Speed:** Basketball players demonstrate significantly higher agility and sprinting ability compared to volleyball players.

These results highlight the sport-specific adaptations of athletes: volleyball emphasizes vertical explosiveness, while basketball prioritizes multidirectional movement and sprint performance. Coaches and trainers can use this information to design targeted conditioning programs, such as agility and sprint training for volleyball players, and plyometric/power development for basketball players, to balance and optimize their physical performance.

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