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A study of selected physical fitness components of Punjab basketball players

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Abstract
A basketball player needs to maintain both physical and mental well-being to participate in the sport, which engages both the mind and body. Research indicates that athletic performance in basketball is largely influenced by physical characteristics, including overall and specific fitness, skill in the game, tactical understanding, and competitive capability. The study involved sixty participants and aimed to evaluate the physical fitness levels of different groups of basketball players from Punjab schools, both in urban and rural settings. The ages of the players fell between 16 and 19 years. Data analysis was performed using the t-test at a significance level of 0.05. The results showed that players from rural areas exhibited higher levels of physical fitness compared to their urban counterparts.

Keywords: Punjab basketball players, urban counterparts, physical fitness components

Introduction
The Amateur Basketball Federation of India (A.B.F.I.) introduced basketball to India in 1972 for men, women, boys, and girls. A variety of factors influence performance in sports, including physique, body composition, physiology, and psychology. Among these, physique and body composition are particularly significant. Numerous studies on basketball have indicated that a player's performance is reliant on factors such as their physique, overall physical fitness, specific physical fitness, skills required for the game, tactical knowledge, and competitive ability. These studies suggest that physique, body composition, and physical fitness are crucial for achieving high levels of performance in basketball across different participation levels. Since physique and body composition serve as a necessary foundation for sports, investing substantial time and money on basketball players who do not possess the appropriate size, shape, and body composition is futile for their conditioning and training programs.

Basketball is an intensely demanding sport that poses significant physical challenges. It is recognized for its combination of both fundamental and specific skills. To master these skills, whether defensively or offensively, basketball players must enhance their physical attributes, which allow them to fulfill their roles throughout the game. Specialized physical training in basketball serves as a crucial foundation for players to meet the unique demands of the sport, including physical, technical, and tactical aspects.

This study's significance comes from highlighting a vital element of specialized training and competition preparation, as the outcomes of matches reveal that many players struggle with essential skills like passing, dribbling, and shooting. This observation allows the author to identify the key issues within this research, aiming to scientifically examine and compare the physical fitness variables of rural and urban national-level women basketball players from Punjab, with the goal of enhancing basketball performance. A deeper understanding of the selected physical fitness components associated with successful basketball players can lead to improved selection and training practices.

Procedure and Methods
For this study, a total of sixty female school basketball players (N=60), aged between 16 and 19 years, were selected as participants. The subjects were chosen randomly, and the tests took place at Government Senior Secondary Girls School on Mall Road in Amritsar.

The participants were divided into two groups: Group-A (N=30) as the Rural group and Group-B (N=30) as the Urban group. During the data collection period, the participants were prohibited from taking part in any competitions.

Physical Fitness

In order to fulfill the goals of the current research, which involves comparing the physical fitness of basketball players from urban and rural areas, the following fitness components were selected:

- **Cardio:** Respiratory endurance-Cooper 12-minute run-walk
- **Explosive strength:** Vertical jump
- **Speed:** 50-meter dash
- **Flexibility:** Sit and reach test
- **Agility:** Shuttle run

- **Cooper 12 min run-walk:** Set markers at regular intervals around the track to help measure the total distance. When the signal for ready/go is given, the participant should cover as much distance as possible within 12 minutes. If the track or running area has been divided into sections every 200 meters, the tester can keep track of the number of completed laps along with the distance of any additional incomplete lap covered during the 12 minutes. While it is important for the tester to motivate all students to run for the full duration of 12 minutes, walking is permitted, and the total distance achieved in exactly 12 minutes will be noted.
- **Vertical jump:** The athlete positions themselves sideways next to a wall and extends the hand closest to the wall upwards. With their feet flat on the ground, they mark or record the point reached by their fingertips. This measurement is referred to as the standing reach height. Next, the athlete steps away from the wall and performs a vertical jump, using both arms and legs to help propel themselves upward. They then try to touch the wall at the apex of their jump. Scoring: The score is determined by the difference in height between the standing reach and the jump height. The best result out of three attempts is noted. The score is calculated by measuring the difference between the standing reach height and the jump height. The best result from three attempts was documented.
- **50 m dash:** The assessment consisted of executing a single maximum sprint covering 50 meters, with the time being noted. A comprehensive warm-up was conducted, which included some practice runs and accelerations. The individual began from a stationary position, with one foot in front of the other; the forward foot was positioned behind the starting line. After confirming the subject was prepared and still, the starter announced "set" followed by "go." The tester offered tips for optimizing performance, and the participants were urged not to ease up until they had crossed the finish line. Two attempts were permitted, and the fastest time from the two runs was recorded to the nearest second decimal.
- **Sit and reach test:** The test required participants to sit on the floor with their legs extended straight in front of them. The soles of their feet were placed flat against a box. Both knees were kept straight and pressed firmly against the floor, with the tester helping to hold down the knees. With palms facing downward and hands either stacked or placed side by side, the participant was directed to lean forward along the measuring line/scale as far as they could, ensuring that neither hand extended further than the other. After practicing, the subjects reached forward and maintained that position for one to two seconds while the distance was measured. It was important to avoid any sudden movements. The score was noted to the nearest centimeter or half inch, representing the distance reached by the hand. The best result from three attempts was recorded.
- **Shuttle Run:** This test involved having the individual sprint back and forth between two parallel lines as quickly as possible. A set of cones was arranged 30 feet apart, with two blocks of wood or a similar object positioned behind one of the lines. Beginning at the line that was opposite the blocks, on the command "Ready? Go!" the participant dashed to the other line, picked up a block, and returned it to place behind the starting line, then went back to retrieve the second block before sprinting across the line again. The timer was stopped for time recording as soon as the second block was set down on the ground. Participants were allowed two attempts with a short rest in between. The quicker time of the two trials was recorded to the nearest tenth of a second as the final score.

Data Analysis and Results

The statistical analysis indicated significant differences between the urban and rural groups concerning four out of the five fitness components listed, specifically the Cooper 12-minute run/walk, vertical jump, 50-meter dash, and Sit and Reach, for female basketball players from Punjab, with the exception of agility. The agility fitness component was found to be statistically superior among rural school national basketball players, attributed to their more strenuous daily routines.

Table 1: Mean and SD of physical fitness variables

Variables	Urban		Rural		T-Test
	Mean	SD	Mean	SD	
Endurance	2.24	0.12	2.16	0.11	2.680*
Strength	1.68	0.17	1.74	0.05	3.43*
Speed	7.76	0.08	7.65	0.02	2.19*
Flexibility	27.13	0.97	27.90	0.30	2.59*
Agility	8.90	1.02	8.51	0.29	1.35

* Significance level: 0.05 (2.00)

Table 1 presents the average (± SD) results of the Cooper 12-minute run/walk, vertical jump, 50-meter dash, sit and reach, and shuttle run for female basketball players from Punjab competing at the national level. The Urban group's mean values and standard deviations for the Cooper 12-minute run/walk were 2.24 & 0.12, for vertical jump 1.68 & 0.17, for the 50-meter dash 7.76 & 0.08, for sit and reach 27.13 & 0.97, and for the shuttle run 8.90 & 1.02. In contrast, the Rural group's mean values and standard deviations for the Cooper 12-minute run/walk were 2.16 & 0.11, for vertical jump 1.74 & 0.05, for the 50-meter dash 7.65 & 0.02, for sit and reach 27.90 & 0.30, and for the shuttle run 8.51 & 0.29.

The analysis of the data revealed notable disparities between the Rural and Urban groups, as indicated by the computed ‘t’ values for the Cooper 12-minute run-walk test (2.68**),

the 50 m dash (2.19*), the vertical jump (3.43**), the sit and reach (2.59*), and the shuttle run (1.35). The table further illustrates that there are significant differences between the Rural and Urban groups in four fitness variables, specifically the Cooper 12-minute run-walk, the 50 m dash, the vertical jump, and the sit and reach among the five tests that were administered.

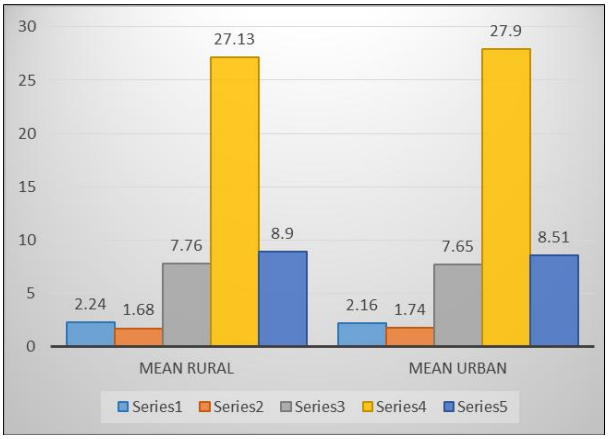

Fig 1: Mean of physical fitness variables

Conclusion

The analysis showed that there were notable differences in the fitness levels between urban and rural women basketball players. The physical fitness of the rural players was observed to be greater than that of the urban players, attributed to their rigorous work routines and balanced diets.

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