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Evaluation of Agility amongst Cricket and Basketball Players: A Cross-Sectional Study

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Abstract: ***Introduction: Zigzag tests are frequently used in a variety of sports and research studies to determine agility. The zigzag agility test requires the athlete to run a course around cones in the shortest possible time and allows us to calculate the outcomes of the test accordingly. Materials and Method: Hundred (100) subjects were selected for this study from different sports associations, and their age ranged from 15-30 years. 50 players were taken from each sport. 5 cones were placed in a zigzag pattern with 10*16 feet rectangular area. The players were asked to run in a zigzag pattern around the cones 3 times after completing warm-up. The pre-vitals and post-vitals were taken before and after the test, respectively. The timings were measured for all 3 rounds through a stopwatch. The mean and standard deviation of the variables were calculated. The data of the selected variables were analyzed through statistical procedures by using a statistical analysis software. Result: This study showed that there is no significant difference in performance, i.e., the average speed between cricket and basketball players is almost the same. Conclusion: No significant difference in speed suggests that this study shows equal effectiveness in both the sports.***

Keywords: Zigzag agility test, average speed, Cricket players, Basketball players

1. Introduction

To enhance the protection of the neuromuscular system from injury, every sport possesses various levels of sensory motor processes. Basketball and cricket both require upper and lower extremity activities such as dribbling, passing and shooting for basketball and batting, fielding and bowling for cricket.

Agility testing: Agility is the capacity to change course, controlling the direction and position of one's body while maintaining momentum. It is important in all ball games and combat sports. Using the most accepted test for a given sport offers the possibility to compare test results with other players.[1]

Basketball: Basketball is a game played between two teams of five players each, on a rectangular court. Each team tries to score by tossing the ball through the opponent's goal, an elevated horizontal hoop, and net called a basket. Basketball is a dynamic sport that builds stamina from the short sprints required for running up and down the length of the court. Leg muscles are critical for playing basketball. Guards can improve their explosiveness and take a quicker first step by strengthening their calves, hamstrings, and quads. Leg muscles are also important when shooting a basketball. Strong thigh muscles provide the boost needed to power a player off the ground and allowing the player to shoot the ball with proper technique. The calves are critical for rebounding as they provide the initial spring that lifts the toes off the ground. The shoulder, chest, biceps, and triceps are all muscle areas that basketball players use during play.[2]

Agility in basketball: Basketball requires constant changes of direction. Therefore, acceleration is an extremely important aspect of agility. Frequently, the game is played in short bursts of a few feet or less before a change of direction is required. One needs the agility to be able to explode when penetrating to the basket, get into position to take charge, or catch up to an opponent after a turnover in a fast break situation. An individual, or team, who is extremely agile, will excel on fast breaks, defense, and pressing. Agility training will help gain fractions of a second on that first step, and those fractions of a second can be the difference between an uncontested layup and a turnover.

It is recommended to consider the concept of specificity when designing agility training for the basketball program. The footwork encountered by a point guard is going to be different from that of a forward or center. Hence, players should be divided into groups based on their positions on the basketball court. Agility training improves the chances of victory in a game and it also has a very positive psychological effect on the athlete.

Cricket: Cricket is played with a bat and ball and involves two competing sides (teams) of 11 players. As there are 11 players in a team and 2 of them must be the bowler and wicket-keeper, only 9 other positions can be occupied at any one time. Batting, bowling, and fielding are the three main activities in cricket. Depending on the activity, different upper and lower body structures are involved. Since extensive running is involved for all cricket players, a significant focus on the hamstring, quadriceps, and calf muscles must be included in cricket training. In batting, the

upper limb structures, such as the shoulders and chest muscles play a significant role. The hips, buttocks, lower back, and core muscles are also crucial for generating power to hit the ball. Bowling places great deal of stress on the core muscles, particularly the lower back muscles and hips.[3]

Agility in cricket: In modern cricket, the ability to change direction quickly, run between the wickets, catching and chase the ball need agility. It can be observed that agile cricketers excel while fielding or making a run.
Concluding all the above information, both cricket and basketball players need agility for better performance. This is a comparative evidence-based study on the evaluation of agility between cricket and basketball players and the comparison of which sport requires agility as an important factor.

Zigzag Agility Test: The zigzag test is a fitness test of agility. This test requires the athlete to run a course around cones in the shortest possible time.

Purpose: To test power, speed, quickness, and body control in multiple planes of movement. The test also assesses lower extremity control, including the ability to perform plant and cut types of movements correctly.

Test results depend on the muscle power and speed of the players and vary according to age, gender and games. Young players aged up to 30 years show more power and speed. Male players are usually more agile than female players.

So, considering this, the group of players aged between 15 to 30 has been taken for the study in both games.

2. Literature Survey

1) **Ankansinha (2020):** Compared agility among state-level players of Kabaddi, Kho-Kho, and Solaimani in Tripura using ANOVA. Significant differences were found between Kabaddi and Solaimani, and Kho-Kho and Solaimani.
2) **Scanlan (2019):** Identified power-related determinants of Modified Agility T-Test in male adolescent basketball players. Results informed training approaches to enhance change-of-direction performance.
3) **Taparia & Shah (2019):** Assessed agility in amateur volleyball and basketball players. Both groups exhibited good agility, with no significant differences between them.
4) **Kumar (2018):** Investigated speed and agility among university players of football, handball, and volleyball. Handball players outperformed others, suggesting targeted conditioning is needed for football and volleyball players.
5) **Dhapola (2017):** Studied the effect of SAQ training on agility and endurance in cricket players. Experimental groups showed significant improvements, highlighting SAQ's effectiveness in enhancing physical conditioning.
6) **Mandal (2017):** Compared speed and agility between university-level cricket and football players. No significant differences were found between the groups.
7) **Boora (2016):** Examined agility differences between batsmen and bowlers. Batsmen showed significantly better agility than bowlers.
8) **Zemková (2014):** Compared agility across athletes of various sports. Racquet sport athletes showed the best agility, followed by combat sports, ball sports, and tactile-response combat sports.
9) **Brown (2012):** Validated the Lane Agility Test (LAT) for collegiate basketball players. LAT was found reliable and strongly correlated with T-Test and Pro Agility Test.
10) **University of Belgrade (2012):** Compared speed and agility of 12- and 14-year-old elite basketball players. Fourteen-year-olds performed better, highlighting the need for age-specific training.

3. Methodology

3.1 Materials and Methods

1) **Study Setting:** Participants were recruited from Lalbhai Contractor Stadium and Ubantu Cricket Academy for cricket and from Gajera Vidhyabhavan and Bhagwan Mahavir Sports Academy for basketball in Surat, Gujarat.
2) **Research Design:** Cross-sectional study.
3) **Study Participants:** Male and female cricket and basketball players aged 15–30 years.
4) **Sample Size:** A total of 100 participants (50 players from each sport).
5) **Sampling Technique:** Convenient sampling method.
6) **Data Collection Procedure:**

3.2 Pretest Preparation:

- **Equipment:** Marker cones, stopwatch, and non-slip surface. Forms for recording results and first-aid equipment were prepared. Testing areas were ensured to be hazard-free.
- **Pretest Measures:** Participants completed health risk screenings, provided informed consent, and filled out a Physical Activity Readiness Questionnaire. Basic information (name, age, gender, height, weight) and vitals (heart rate, respiratory rate, oxygen saturation) were recorded.
- **Athlete Preparation:** Participants removed restrictive accessories and received explanations about the procedure. A standard warm-up routine was followed.
- **Test Procedure:** The Zigzag Agility Test was conducted on a rectangular course (10 × 16 feet) with cones labeled 1 to 4 and a center cone (C). Participants ran the sequence: 1 → C → 2 → 3 → C → 4 → 1, completing the course three times with 10 seconds of rest between trials. The average time was recorded for analysis.

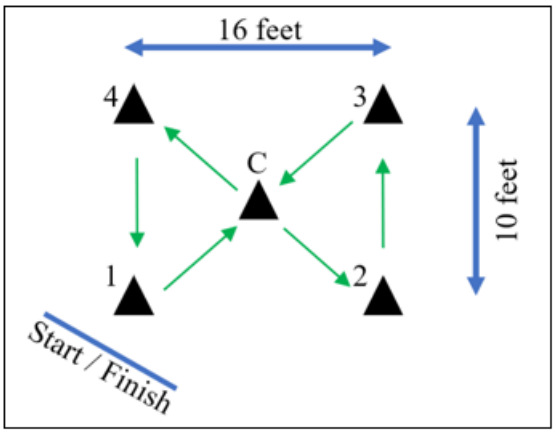

Figure 1: Standard Zigzag Agility Test Course

Modifications: Distance between cones or the number of circuits could be adjusted as needed.

- **Posttest Procedure:**

Vitals (heart rate, respiratory rate, oxygen saturation) were measured post-testing.

- **Data Analysis**

The results were analyzed to compare participant performance. Improvements in agility and speed were assessed based on training progress and previous test results.

4. Results

- Total 100 numbers of male participants were included in this study. Out of 100 participants, 50 participants were cricket players and 50 were basketball players.
- Table 1 shows the Mean and SD value of age, weight, height, and BMI of cricket players, and Table 2 shows the Mean and SD value of age, weight, height, and BMI of basketball players.

Table 1: Demographic details of Cricket Players

No.	Demographic Details	Mean (SD)
1.	Age	17.33 (2.42)
2.	Weight	65.62 (12.73)
3.	Height	1.68 (0.06)
4.	BMI	23.18 (4.79)

Table 2: Demographic details of Basketball Players

No.	Demographic Details	Mean (SD)
1.	Age	21.35 (3.77)
2.	Weight	65.09 (9.36)
3.	Height	1.71 (0.07)
4.	BMI	22.26 (3.89)

Table 3: Pre and post zigzag test vital measurements

No.	Vitals	Cricket Players		Basketball Players	
		Pretest Mean (SD)	Posttest Mean (SD)	Pretest Mean (SD)	Posttest Mean (SD)
1.	Heart rate (beats/min)	104.73 (16.73)	158.15 (17.33)	104.38 (16.97)	157.95 (15.57)
2.	Respiratory rate (breaths/min)	15.29 (1.95)	42.52 (8.84)	15.33 (2.51)	47.62 (7.01)
3.	SpO_2 (%)	97.82 (1.19)	96.82 (1.94)	97.04 (1.75)	96.16 (2.45)

Table 4: Details of zigzag agility test

No.	Zigzag Agility Test	Cricket Players Mean (SD)	Basketball Players Mean (SD)
1.	Time to complete test (seconds)	7.82 (0.54)	8.56 0.67)

5. Discussion

The present study examined the agility amongst cricket players and basketball players, as these abilities are considered critical to success in both sports. In this, the study has been conducted on amateur players who lack efficient training to improve agility. Amateur players are not consistent with the hours of play and almost end up playing the game without any prior conditioning. This, in consequence, results in no significant differences amongst players of both the sports and amongst each other. There was no significant difference in agility between cricket and basketball players. In both the sports, this component is omnipotent and in both cases, moves are moreover the same, hence, it could be one of the potential reasons that this present study finds no significant difference between cricket and basketball.

In cricket and basketball horizontal and diagonal movement with jump or horizontal jump and agility are there and both the sports players need quality of agility. Both the games require a high degree of running maneuverability and total body agility so that the players are able to gain good court positions and compete with their opponents on both offensive and defensive maneuvers. Also, it requires a fast acceleration in order to be able to sprint to an advantageous position while playing.

As we have seen that Table 4 shows the comparison of the mean agility skill of cricket and basketball players on the Zigzag Agility Test where the difference of SD of cricket and basketball players $p = 0.13$ and hence, the test is not significant as $p > 0.05$ but it reveals that the agility of cricket players (7.82) was higher than basketball players (8.56).

6. Conclusion

Within the limitations of the study, the study may be concluded that the mean performance in the agility of cricket players was to some extent better than that of the basketball players, but not significant. And both games require agility as an important factor in their performance. No significant difference suggests their same fitness routine or game strategy.

7. Future Scope

The future scope of this study includes:

- Expanding the sample size to include athletes from different skill levels and regions for broader generalization.
- Longitudinal studies could be conducted to assess how agility improves over time with consistent training.
- The study could explore gender differences in agility performance.
- Advanced agility tests could be used to identify which test best measures performance in cricket and basketball.
- A position-based study could examine how different roles in each sport impact agility.

8. Limitations

- The small sample size of amateur players limits the generalizability of the results.
- The varying training levels of participants may have influenced the findings.
- The controlled test environment may not accurately reflect real-game conditions.
- The study's age range of 15-30 years excludes other age groups, limiting its applicability.
- Manual timing introduces potential errors in the results.
- External factors, such as diet and sleep, were not controlled.
- The short duration of the test may not account for fatigue effects.

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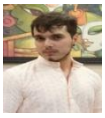

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