Correlation of the Speed, Agility and Vertical Jump with the Shooting Precision in Recreational Basketball Players.

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***Abstract*- The Recreational Sports have become incredibly popular in recent decades with the aim of fitness and enjoyment. Basketball is considered to be one of the most popular Recreational Sports with the rise in non-professional League participation; athletes from different nations find it appealing. In Basketball, Shooting Precision is one of the key abilities that are determined by various factors. This study aimed to investigate the correlation between Speed, Agility, Vertical Jump, and Shooting Precision in Recreational Basketball Players. A total of 68 Recreational Basketball Players were approached out of which 60 Players of age group 18-35 (mean 22.5+-2.096) years, fulfilling inclusive criteria (males=46, females=14) were recruited for the study. The Players were evaluated for the Speed using 20-meter Sprint test, for Agility using Agility-T test, and for Vertical Jump using the Vertical Jump test. The Shooting Precision was evaluated based on the number of successful shots made in 10 consecutive shoots. The study showed high correlation between Speeds (0.948), Agility (-0.833) and Vertical Jump (0.821) with the Shooting Precision (p= <0.0001)**

Keywords: **Correlation, Speed, Agility, Vertical Jump, Shooting Precision, Recreational Basketball Players.**

INTRODUCTION:

The Recreational Sports have become incredibly popular in recent decades with the aim of fitness, enjoyment and some change in their lifestyle and busy schedule. Additionally, sports have become an integral element of human life, a tendency that is expected to continue in the future[1]

Basketball is considered to be one of the most popular Recreational Sports with the rise in non-professional League participation; athletes from different nations find it appealing. Basketball is one of the fastest team sports game which requires mastery over fundamental skills like dribbling, passing, shooting and rebound defense etc. The Players have to deal with variety of unstable balancing scenarios, such as boxing out, dribbling, accelerations and decelerations with the changes in direction, and penetrations into the defensive perimeter along with recovering from defensive position, that are unique to basketball. These activities frequently take place in very small spaces and call for extremely quick movements, excellent coordination, and the necessary strength. [234]

In Basketball, Shooting Precision is one of the key abilities that determine the Player's performance. The Shooting Precision depends on multiple factors such as anthropometry and physical fitness in addition to the technical, tactical, and psychological expertise.[25] The Physical fitness components of the Basketball player comprise of the factors such as Speed, Agility, and Vertical Jump. In basketball, agility and speed are examples of complex psychomotor skills. They both entail moving the body as quickly as possible, but agility also involves changing directions.[67]

Basketball places a unique emphasis on agility due to the large number of irregular game circumstances that call for several rapid changes in direction inside the relatively constrained space of the court[8]. One of the actions that basketball players most frequently undertake is the Vertical Jump. Basketball players perform offensive and defensive moves during practices and games that include jumping[9].

There exists lack of research work evaluating factors associated with Performance in Recreational Basketball Players. Therefore the aim of the study was to investigate the correlation between Speed, Agility, Vertical Jump, and Shooting Performance in Recreational Basketball Players. It was hypothesized that, **yes** there is a high correlation between Speed, Agility and Vertical Jump with the Shooting Precision in Recreational Basketball Players.

MATERIALS AND METHODS:

The study was reviewed and permission was obtained from the Institutional Ethical Committee at Tilak Maharashtra Vidyapeeth, Pune.

Sampling and Participants Recruitment*:* Around 68 Recreational Basketball Players across Pune city, Maharashtra India, were approached. The aim and purpose along of the study was thoroughly explained and the players were screened for Inclusion & Exclusion criteria. The Player with the Age ranged between 18 to 35 years, both males and females were included for the study whereas the players demonstrating any recent musculoskeletal injury in past 1 year and those unwilling to participate in the study were excluded.

Data Collection: Finally 60 Players (males=46, females=14) with mean age mean 22.5±2.096 years were recruited for the study.

Speed: For speed, the 20 m sprint test was used. Players were at the start line of a 20 m long track and asked to run down the track as fast as possible. Time taken by the players to complete down the 20 m track as fast as possible was noted in seconds.

Agility: For agility, agility T test was used. Four cones are placed in a T-shaped as in the distance between 1st and 2nd cone werev10 m and 3rd and 4th cone were placed 5 m apart from the 2nd cone on left and right respectively eventually the distance between 3rd

and 4th cone were 10 m. Players started from 1st cone from there players ran down to 2nd then to 3rd then to 4th and came back to 1st cone as fast as possible, again, the time taken by the players the test to complete the test was noted in seconds.

Vertical jump: For vertical jump, vertical jump test was used. Players stood close to a long wall with a chalk on his/her dominant hand, after that the player elevated the dominant hand completely and mark on the wall with the chalk, after that the player was asked to jump as high as possible while jumping player again mark on the wall at the maximum point. The distance between two points was calculated in cm, which eventually is the total vertical distance jumped by the player.

Shooting Precision: For Shooting Precision the player stood on the free throw line and got (at least) Ten (10) chances to basket and from that the shooting Precision was calculated.

Statistical analysis: The data was analyzed and the Pearson's Correlation Coefficient was determined between the Speed, Agility, and Vertical Jump with the Shooting Precision of Recreational Basketball Players using In-stat software.

RESULTS:

The Table 1 shows the relationship between Speed and Shooting Precision. The Pearson's Correlation Coefficient of Speed-Shooting Precision was 0.948; suggesting a **positive correlation**. The p value is <0.0001 hence the correlation is extremely significant.

The Table 2 shows the relationship between Agility and Shooting Precision. The Pearson's Correlation Coefficient of Agility-Shooting Precision was -0.833; suggesting a **negative correlation**. The p value is <0.0001 hence the correlation is extremely significant.

The Table 3 shows the relationship between Vertical Jump and Shooting Accuracy. The Pearson's Correlation Coefficient of Vertical Jump-Shooting Precision was 0.821; suggesting a **positive correlation**. The p value is <0.0001 hence the correlation is extremely significant.

DISCUSSION AND IMPLICATION:

While evaluating the correlation between Speed, Agility, and Vertical Jump with the Shooting Precision of Recreational Basketball Players, we found that there exist high correlation between Speed and the Shooting Precision (r=0.948, p= <0.0001) (Table 1, Figure 1). Speed is one of the important factors as players with speed can quickly move up and down the court, creating fast break opportunities for the team. Speed also helps players in getting open for shots and layups. A positive correlation of Speed and Shooting Precision simply says that the player who can run faster and move quickly on court can generate more power and momentum to shoot the basket. This can help them shoot the basket from greater distance and with more speed, which can increase the likelihood of the ball going in the basket. Okazaki, V et.al[10] have done study on 15 basketball players and the got the similar result as we got.

Also we found high correlation between Agility and the Shooting Precision (r=-0.833, p= <0.0001). The Players with better Agility showed better Shooting Precision (Table 2, Figure 2). This could be because Players with better Agility would have a better control over the ball and would shoot a basket more precisely. The study done by Apaak Daniel et.al[11] also demonstrated high correlation between Agility with variables of Shooting Precision such as static free throw, static two points.

There was a high correlation between Vertical Jump and the Shooting Precision as well (r=0.821, p= <0.0001), (Table 3, Figure 3). Vertical jump is one of the prevalent acts performed by Basketball players. The Shooting Precision majorly depends on the Vertical Jump. Higher vertical jump may allow the player to release the ball at a higher point, which could result in a higher arc. A higher arc can increase the chances of ball going in the basket, as it gives the ball more room to clear the rim and drop through. Gur. S. et.al[12], in the study on elite basketball players, got the similar results.

Practical Implications: For the trainer/coach to train recreational or beginner basketball players this study will help a lot as this study clear out the importance of Speed, Agility and Vertical Jump on Shooting Precision, which is major factor to succeed in basketball. Specifically, the Speed and Vertical Jump correlates positively with the Shooting Precision; so if trainer/coach increases the Speed and Vertical Jump of the players their Shooting Precision should increases according to the study what we have done.

LIMITATIONS:

Only static shooting accuracy was included, dynamic shooting precision should've been included as well to understand about shooting Precision of the players accurately because in a real game scenario the dynamic shooting Precision is more needed than the static shooting Precision.

The measures used to assess Speed, Agility, Vertical Jump, and Shooting Precision may have some measurement error, which could impact the accuracy of the results. More than one test should perform to get the better and more accurate study of the each individual component.

Other factors that are not accounted for in the study may also impact shooting performance, such as hand-eye coordination, balance, coordination, upper limb strength and core strength.

CONCLUSION:

The present study concludes that Speed, Agility and Vertical jump has high correlation with the Shooting Precision in Recreational Basketball Players.

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Author Contribution:
Dr. Ujwal Yeole and Veeren Shah were involved in conceptualization, formal analysis, writing the original draft preparation, and methodology, survey, in writing–review and editing. All authors have read and agreed to the published version of the manuscript.

Data Availability Statement:
The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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