# THE RELATIONSHIP BETWEEN PASSING AND SHOOTING PERFORMANCE IN YOUNG BASKETBALL PLAYERS

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**ABSTRACT**
*Basketball technique refers to the specific motor skills players perform according to game rules and team tactics. Among the most prominent offensive skills are shooting, passing, and dribbling, which are heavily emphasized in training due to their importance in real-game situations. Shooting is a key to scoring—the primary objective—while passing promotes teamwork and offensive structure, making both skills vital for success. This study explored the relationship between passing and shooting performance in youth basketball, focusing on these two technical elements as actions that involve the deliberate propulsion of the ball with an emphasis on accuracy, particularly in shooting tasks. It involved 86 top male Serbian basketball players, aged 13–14, who were selected by experts from the Basketball Association of Serbia. Two passing tests—two-handed (2HPT) and one-handed target passing (1HPT)—served as independent variables. Shooting performance was assessed through a mid-distance test (MD30) and a stationary five-position shooting test (SH5P), which were the dependent variables. Data were analyzed using descriptive statistics, Pearson correlation, and multiple regression. Significant correlations were found between both passing and both shooting variables. Importantly, passing skills significantly predicted shooting performance under the basket ($R^2$=.116; F=7.316; p=.0057), but not from outside positions. The results suggest that for young players, improved passing ability is associated with greater accuracy in close-range shooting. This may be due to improved hand-eye coordination, ball control, and decision-making developed through passing drills. Therefore, emphasizing passing in youth training programs could enhance overall offensive effectiveness, particularly in scoring scenarios near the basket. Integrating such drills may support the technical development of young athletes, reinforcing the connection between fundamental skills and in-game performance.*

***Keywords****: skills, teamwork, training, Mikan drill, development*

## INTRODUCTION

Shooting, passing, and pivoting are offensive technical skills with the ball that date back to basketball's origins, while dribbling appeared five years later (Wolf, 1991). Points in basketball are awarded for successful shots, which at first glance makes shooting the most important offensive skill, while passing is considered the second most important skill (Nunes et al., 2016). However, passing is a technical skill without which it is not possible to play basketball, as it is the only way the ball can be inbound into the game after a point, a foul, or a rule violation made by the opposing team. When you add to that the understanding of shooting as "passing the basket to the hoop", as the great John Wooden (Wooden & Carty, 2005) said, and of course passing as a basic element of cooperation between offensive players, the opinion is even more certain that passing is still the most important technical skill in basketball. In addition, a significantly higher number of passes than shots (or dribble) are made in basketball matches (Vencúrik et al., 2021; Arias-Estero, 2013).

Common to these two skills is that the ball is thrown (launched), albeit in different ways with different characteristics of the ball's trajectory. Shooting from a distance is actually an oblique shot with a parabolic path of the ball, and the following important kinematic factors stand out: launch height, launch speed, launch angle, and reverse rotation-spin (Hay, 1978). The pass is a horizontal shot (the path of the ball is almost a straight line) and the important kinematic factors are: throw speed, throw height, and air resistance (Hay, 1978). That is why these two skills have certain characteristics and performance rules, which is why they differ. The success of shooting and passing in the game depends on various biomechanical param-

eters (Fontanella, 2006), as well as on the players' tactical skills, primarily in terms of decision-making and the type of shooting or passing (Karalejić & Jakovljević, 2022). In basketball, offensive players often initiate an action with the primary goal of shooting (penetration or a jump shot), but then decide to pass the ball to a teammate. Players prepare to make two movements with different goals in parallel, which can be transferred to any movement if the movements differ in their approach to the common movement. This, of course, speaks to the intricate connection between cognition and motor control (Wakatsuki et al., 2024) that underlies tactical skills. In this way, shooting and passing are further linked.

Thus, performance in shooting tests is correlated with shooting efficacy and game performance (Jakovljević, 2007), while performance in passing skill tests is not correlated with passing efficacy but is correlated with game performance (Sachanidi et al., 2013).

Despite the differing kinematic characteristics of passing and shooting in basketball, this study aimed to explore potential relationships between these two offensive skills, specifically through performance outcomes in various shooting and passing tests. Given that both skills are frequently practiced—often within the same training sessions and exercises—it was hypothesized that there would be a significant correlation between passing and shooting variables.

## METHODS

### *Sample*

The sample of respondents consisted of 86 of the most promising young Serbian basketball players aged 13 and 14, selected by the experts of the Basketball Association of Serbia. All respondents have played basketball for at least two years and voluntarily agreed to participate in this research.

### *Procedure and Variables*

Basketball skill variables were measured using standardized skill assessment tests that have been widely utilized in both coaching practice and empirical research to date.

The variable *Shot Under the Basket* (MD30) was assessed using a test originally proposed by Lehman (1981) (Karalejić & Jakovljević, 2009; Jakovljević, 1995). This test is commonly referred to in practice as the *Mikan Drill*. The player begins in a stationary position directly beneath the basket, facing the backboard. Upon the scorer's signal, the player commences shooting using a semi-hook technique, alternating between the right and left hands. The objective is to score as many successful shots as possible within a 30-second interval. The task is performed twice, with a two-minute break between trials, and the higher of the two scores, based on the number of successful shots, is recorded.

The variable *Medium-Distance Shot* (SH5P) was measured using a protocol developed by Perić (1994) (Karalejić & Jakovljević, 2009; Jakovljević et al., 2019). This test is widely used in coaching practice and has several variations. The player performs jump shots from five predesignated positions (see Figure 1), beginning from the corner. At each position, the player attempts three shots, resulting in a total of 15 attempts. The shooting distance is standardized at 4.55 meters. The task is performed twice, with a two-minute break between trials, and the number of successful field goals is recorded; the higher score is used for analysis.

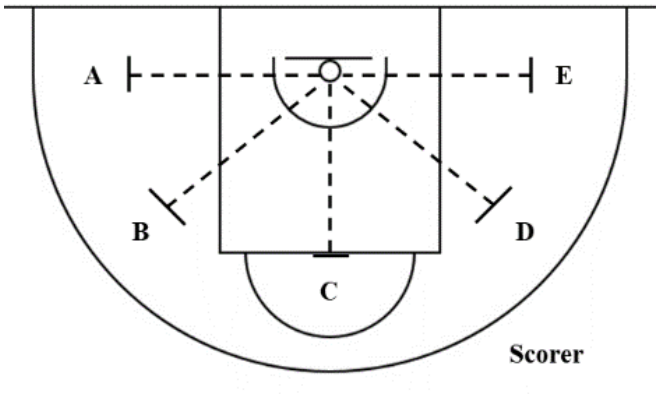


**Figure 1.** *Test Shot from 5 positions*

The variables *Two-Handed Passing to the Target* (2HPT) and *One-Handed Passing to the Target* (1HPT) were assessed using the *Passing to the Target Test*, a component of Johnson's basketball test battery (Barrow & McGee, 1975). The test requires a basketball, and a rectangular target measuring 150 x 100 cm (see Figure 2). The player stands behind a designated line at a distance of 12.2 meters and performs 10 chest passes using both hands, followed by 10 passes using the dominant hand only. Each pass is directed at the target, with the aim of scoring as many points as possible. Points are awarded based on accuracy, and the total score from the 10 passes is summed. The test is conducted three times (one of which is a trial run), and the best performance is retained for further analysis.

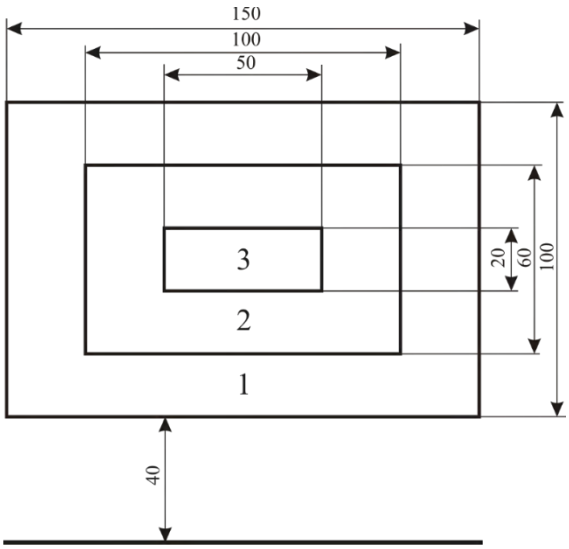


**Figure 2.** *Passing the ball to the target test (dimensions are in centimeters)*

***Statistical analysis***

The normality of the data distribution was verified before proceeding with further analysis. Basic descriptive parameters were calculated, including the arithmetic mean (M), standard deviation (SD), minimum value (Min), and maximum value (Max). Additionally, the correlation coefficients between the results of the four tests were calculated, and a regression analysis method was employed to examine the influence of the independent variables on the dependent variables. The threshold for statistical significance was set a priori at $p < .05$. All statistical analyses were performed using IBM SPSS Statistics for Windows, Version 20.0 (IBM Corp., Armonk, NY, USA).

**RESULTS**

Table 1 presents the descriptive statistics, including mean values, standard deviations, and minimum and maximum scores for the variables assessed. The data obtained provide insight into the technical proficiency of young basketball players in the domains of passing and shooting performance.

**Table 1.** *Mean, standard deviation, minimum and maximum values*

| Variable | *M* ± *SD* | Min | Max |
|---|---|---|---|
| 2HPT (*p*) | 19.54 ± 3.85 | 8.00 | 28.00 |
| 1HPT (*p*) | 18.58 ± 4.22 | 5.00 | 26.00 |
| MD30 (*p*) | 10.69 ± 2.79 | 4.00 | 16.00 |
| SH5P (*p*) | 8.41 ± 2.36 | 3.00 | 14.00 |

Table 2 displays the Pearson correlation coefficients among the measured variables. A statistically significant moderate correlation was found between the two passing variables (2HPT and 1HPT), as well as between the two shooting variables (MD30 and SH5P). Additionally, the MD30 variable demonstrated significant positive correlations with both passing variables. However, the SH5P variable did not show a significant correlation with either passing variable.

**Table 2.** *Correlation Matrix*

| Variable | 2HPT | 1HPT | MD30 | SH5P |
|---|---|---|---|---|
| 2HPT | 1 | | | |
| 1HPT | .370** | 1 | | |
| MD30 | .331** | .246** | 1 | |
| SH5P | -.025 | .079 | .246** | 1 |

***p=.01*

To further explore these relationships, multiple regression analyses were conducted, with the shooting variables (MD30 and SH5P) serving as dependent variables and the passing variables (2HPT and 1HPT) as predictors (Tables 3 and 4).

**Table 3.** *Multiple Regression Analysis – Dependent Variable: MD30*

| DF | *R* | *R*–squared | Adj. *R*–squared | Std. Error |
|---|---|---|---|---|
| 86 | .341 | .116 | .095 | .691 |

| Source | DF | Sun Squares | *Mean* Square | F-test |
|---|---|---|---|---|
| Regression | 2 | 5.261 | 2.63 | 5.514 |
| Residual | 84 | 40.072 | .477 | p=.0057 |
| Total | 86 | 45.333 | | |

| Param. | Value | Std. Err. | Std. Value. | *t*-Value | Probability |
|---|---|---|---|---|---|
| 2HPT | .094 | .030 | .353 | 3.132 | .0024 |
| 1HPT | -.008 | .028 | -.032 | .288 | .7739 |

*Dependent variable: MD30*

The regression analysis revealed a statistically significant model ($p$ = .0057), with the 2HPT variable emerging as a significant predictor of MD30 performance ($p$ = .0024). The 1HPT variable did not contribute significantly to the model ($p$ = .7739) (Table 3).

**Table 4.** *Multiple Regression Analysis – Dependent Variable: SH5P*

| DF | *R* | *R*–squared | Adj. *R*–squared | Std. Error |
|---|---|---|---|---|
| 86 | .241 | .058 | .036 | 1.557 |

| Source | DF | Sun Squares | *Mean* Square | F-test |
|---|---|---|---|---|
| Regression | 2 | 12.582 | 6.291 | 2.595 |
| Residual | 84 | 203.648 | 2.424 | p=.0806 |
| Total | 86 | 216.23 | | |

| Param. | Value | Std. Err. | Std. Value. | *t*-Value | Probability |
|---|---|---|---|---|---|
| **2HPT** | .152 | .067 | .262 | 2.256 | .0267 |
| **1HPT** | -.04 | .062 | -.075 | .643 | .5223 |

*Dependent variable: SH5P*

In contrast, the regression model for SH5P did not reach statistical significance ($p$ = .0806), although the 2HPT variable approached significance ($p$ = .0267), suggesting a potential trend. The 1HPT variable was again not a significant predictor (Table 4).

## DISCUSSION

The results presented in Table 1 can be indirectly compared with findings from previous studies and existing literature. In relation to normative data provided by Lehman (1981), the respondents demonstrated suboptimal performance in the *Mikan drill test*. This outcome is consistent with expectations given their younger age and developmental stage. Furthermore, their performance was also inferior to that of junior athletes reported in the study by Jakovljević (1995). Similarly, in the mid-range shooting test, the participants exhibited lower scores compared to juniors in both Jakovljević (1995) and Jakovljević et al. (2019). Interestingly, in the passing test, the respondents achieved slightly better results than those reported for juniors by Jakovljević (1995), despite being younger, physically less developed, and likely possessing less refined technical skills. This unexpected finding

may be attributed to increased concentration or motivation during the testing procedure. Additionally, the approximately three-decade temporal gap between the current and past studies may suggest a generational improvement in passing skills among younger basketball players.

A statistically significant, moderate correlation was observed between the passing performance variables, as well as between the two shooting performance variables, which was anticipated based on prior theoretical expectations. The significant associations between the Mikan Drill variable (MD30) and both passing variables are consistent with the initial hypothesis of this study. In contrast, no significant relationship was found between the spot shooting variable (SH5P) and either of the passing performance measures. To further investigate these relationships, regression analyses were conducted with the shooting performance variables (MD30 and SH5P) as dependent variables and the passing performance variables as independent predictors.

The regression model with MD30 as the dependent variable revealed a statistically significant predictive relationship, particularly for the two-handed chest pass variable (2HTP). However, the relatively low coefficient of determination ($R^2$) suggests that a substantial proportion of the variance in Mikan Drill performance is not explained by the factors included in the current model. The significant influence of 2HTP on MD30 may be attributed to the biomechanical and motor control similarities between the two actions. The Mikan Drill involves repeated lay-up style shots executed under the basket, where the ball's trajectory is short and the shot preparation involves lifting and stabilizing the ball with both hands. Furthermore, these shots require precise redirection off the backboard, targeting the upper section of the rectangular target area, which is known to facilitate higher scoring probability (Fontanella, 2006).

Ball control is a critical component of success in this task, and the role of bilateral hand involvement—both in stabilizing and positioning the ball prior to release—likely contributes to the observed relationship. Additionally, it is worth noting a commonly observed phenomenon in basketball practice, though not yet systematically studied: during two-handed passes, players frequently rely on their dominant hand to initiate the throw, effectively transforming it into a one-handed pass. A similar mechanism may underlie the half-hook shot used in the Mikan Drill, where the ball is carried and prepared with both hands but ultimately released by the dominant hand.

Conversely, the regression analysis with SH5P as the dependent variable showed no significant influence of the independent variables. This suggests that the biomechanical and motor execution patterns involved in passing do not substantially contribute to performance in mid-range shooting. The distinction likely stems from the different kinematic trajectories and release mechanics between the two motor tasks. Mid-range shooting typically involves a parabolic trajectory, initiated with the shooting hand beneath the ball, and the release occurring in an upward, diagonal direction. In contrast, two-handed and one-handed passes are generally executed with the hands positioned behind or to the side of the ball, resulting in a predominantly horizontal projection. These fundamental differences in technique and muscle activation patterns indicate that passing and shooting are governed by distinct motor programs.

Although a positive relationship between shooting and passing performance might be expected due to their co-development in basketball training, where both skills are often practiced concurrently, the findings suggest that their neuromuscular control and biomechanical demands differ significantly. This reinforces the importance of training these skills both in integrated drills and in isolation to optimize their development independently.

## CONCLUSION

This study investigated the relationship between two fundamental technical skills in basketball—shooting and passing—using two standardized test measures for each. The findings indicate a moderate positive correlation between passing performance, particularly two-handed passing, and shooting performance under the basket (Mikan Drill). However, no significant correlation was observed between passing variables and mid-range shooting performance.

These results suggest that the biomechanical and motor coordination demands of passing are more closely aligned with those of close-range finishing techniques than with mid-range shooting. Specifically, the similar preparatory and release mechanics involved in passing and under-basket shooting may account for their observed association. In contrast, mid-range shooting involves distinct ball trajectories and release angles (typically parabolic), which appear to diverge substantially from the mechanics involved in both two-handed and one-handed passing (typically horizontal projections), there-

by limiting any direct transferable effect between these skill domains.

From a practical standpoint, these findings highlight the importance of incorporating passing drills—particularly those involving two-handed control—into training sequences aimed at improving close-range finishing skills. The lack of correlation with mid-range shooting emphasizes the need for targeted shooting practice to address the unique motor demands of this skill.

Nonetheless, it is important to acknowledge that, in the context of gameplay, passing and shooting are functionally interconnected. Many game situations involve a direct transition from receiving a pass to executing a shot, or vice versa, wherein a player may opt to pass instead of shoot. Furthermore, in the training process—from novice to elite levels—these skills are often taught and rehearsed in combination, especially within game-play action-based sequences. Future research may explore how the temporal and decision-making dynamics of these transitions influence the development and execution of both skills in more ecologically valid settings.

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