Pubmedia Jurnal Pendidikan Olahraga Vol: 1, No 2, 2023, Page: 1-18

Comparative Biomechanical Study Between Shooting with Two Points and Three Points from Specific Areas Inside and Outside the Basketball Shooting Area

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DOI:
https://doi.org/10.47134/jpo.v1i2.327
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Received: 11-10-2023
Accepted: 15-11-2023
Published: 28-12-2023

Abstract: The aim of the current research is to identify the relationships and significance of differences in displacements, horizontal and vertical velocities for the strength and accuracy of shooting by jumping with two and three points from specific areas inside and outside the basketball shooting zone at the moment of pivot. It also aims to identify the relationships and significance of differences in displacements, horizontal and vertical velocities for the strength and accuracy of shooting by jumping with two and three points from specific areas inside and outside the basketball shooting zone at the moment of shooting. The research methodology utilized a descriptive approach using survey studies with their tools and procedures, relying on video analysis as it suited the nature of the research. The research sample consisted of three players who were purposely selected to be similar in physical characteristics and skilled in shooting a basketball. Each player performed 10 attempts, divided into five two-point and five three-point shooting attempts. The best three attempts for each player in both types of shooting, which achieved the highest level of accuracy according to the test, were selected from specific areas inside and outside the basketball shooting zone. Thus, the actual attempts subjected to statistical processing were 18 attempts, divided into nine attempts for shooting with two points from areas within the shooting zone and nine attempts for shooting with three points from specific areas outside the shooting zone. The researcher concluded that the logarithmic differences between correlation coefficients for horizontal and vertical displacements and velocities for the strength and accuracy of shooting by jumping with two and three points from specific areas inside and outside the basketball shooting zone favored shooting with three points. Also, the logarithmic differences between correlation coefficients for horizontal and vertical velocities for the strength and accuracy of shooting by jumping with two and three points from specific areas inside and outside the basketball shooting zone favored shooting with three points.

Keywords: Basketball Shooting Technique, Jump Shooting Analysis, Correlation between Displacements and Shooting Accuracy

Introduction

Scoring in basketball is one of the most used special skills during the game and the most important of all, and its mastery is critical to the preparation and excellence of the ball player at all stages of training, from juniors to high-level players, and it occupies the greatest importance among basketball skills due to the use of the feet to score on the basket, pass to a teammate, or pull the ball from in front of the opponent. (Palmer, 2022; Shen, 2020; Supola, 2022; Wei, 2022; Zheng, 2024)

The technical aspects of biomechanics can be used in all sports and in basketball in particular to recognize the mechanical properties of skills, obtain effective mechanical concepts for performance or identify factors associated with successful motor performance and there is a wide range of skills that form the basis of motor performance in basketball (DiCesare, 2019; Reina, 2020; Russell, 2021; Takahashi, 2019).

The development and effectiveness of defense and attack methods in basketball has become an urgent need to increase the effectiveness of offensive skills, including scoring, because mastering the technical performance of scoring and investing favorable opportunities in the least empty space, as quickly as possible and with appropriate accuracy is an effective means of overcoming these methods and through the researcher's observation in club games, he has noticed the low percentage of goals scored through direct scoring on the basket. This prompted the researcher to compare two methods of scoring by jumping two and three points from specific areas inside and outside the basketball scoring area under the same conditions and in the same place in the hope of obtaining important information about optimal performance from the biomechanical point of view to allow players, coaches and teachers to use the results of this study in the training and education processes to improve the level and accuracy of the game (Clemente, 2019; Ferioli, 2020; Heishman, 2019; Mancha-Triguero, 2019; Sarlis, 2020; Wei, 2022).

Methodology

The researcher employed the descriptive survey method, incorporating its tools and procedures, and opted for video analysis as it aligned with the research's nature (2011.198.1). The research population comprised 12 basketball players from the Air Defiance Club for the 2022/2023 sports season. The research sample, representing 33.3% of the original population, consisted of four players selected randomly to ensure similarity in physical style and proficiency in scoring with a right-hand jump. Each player executed 10 attempts, five from two-point areas and five from three-point areas, with the top three accurate attempts selected for statistical processing. The tools included a legal basketball court, 15 basketballs, and a 20x20 drawing scale. Equipment comprised a Dell computer, two SONY video cameras (capturing 100 images/second), and Kinova kinetic analysis software. Mechanical variables measured included horizontal and vertical displacements, horizontal and vertical speeds, and the center of gravity. The research utilized a scoring accuracy test named "Accuracy of shooting from inside and outside the 3-point arc in basketball from the jump" (2003.171.7). The test aimed to assess the accuracy of long-range shooting and involved the use of a master recorder, five basketballs, and two assistants. The tester performed ten throws from specific areas, scoring points based on criteria such as direct entry, touching the ring, and location within or outside the 3-point arc. The scoring method assigned different point values for each scenario, ensuring a comprehensive evaluation of shooting

accuracy. For each ball that does not touch the goal ring and does not enter the ring as shown in Figure 1.

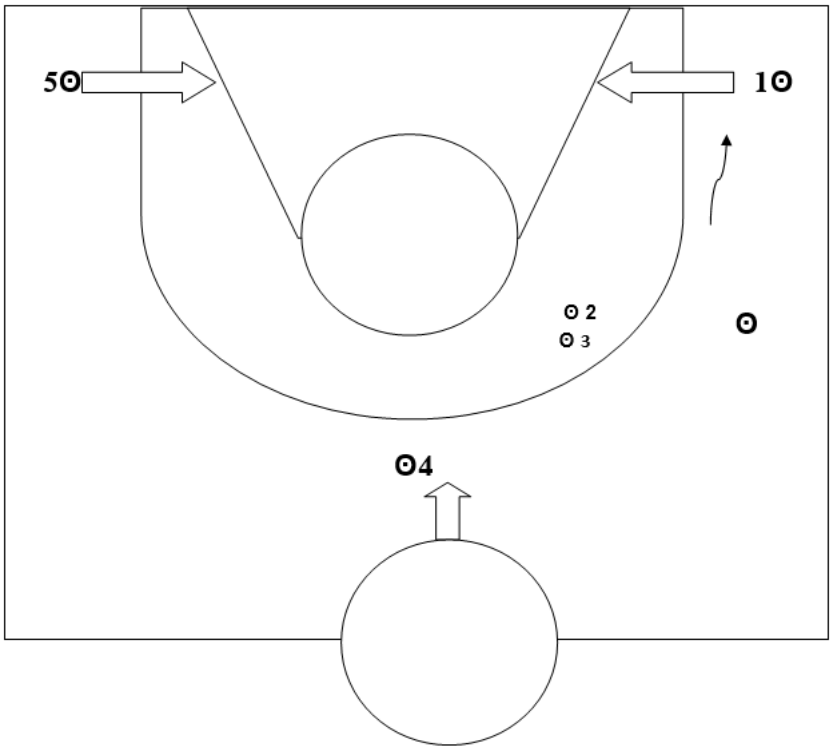

Figure 1. The accuracy of jump shooting from specific areas inside and outside the 3-point arc of the basketball from the jumper

Result and Discussion

In the Results section, summarize the collected data and the analysis performed on those data relevant to the issue that is to follow. The Results should be clear and concise. It should be written objectively and factually, and without expressing personal opinion. It includes numbers, tables, and figures (e.g., charts and graphs). Number tables and figures consecutively in accordance with their appearance in the text.

3.1. Presentation and Discussion of the Results of Mechanical Variables and Accuracy in Two- and Three-Point Jumpers from Specific Areas Inside and Outside the Basketball Scoring Zone

Table 1. Arithmetic mean and standard deviation of the research sample in the mechanical variables and the accuracy of two-point and three-point shooting from specific areas inside and outside the basketball scoring area at the moment of scoring

Vertical speed Centimeter/second		**Horizontal speed Centimeter/second**		**Vertical displacement Meter**		**Horizontal displacement Meter**		**Anatomical regions**
Deviation	The middle	Deviation	The middle	Deviation	The middle	Deviation	The middle	
67.65	169.44	37.26	78.23	57.08	897.11	45.53	659.66	**Elbow joint of the scoring arm**

Vertical speed Centimeter/second		Horizontal speed Centimeter/second		Vertical displacement Meter		Horizontal displacement Meter		Anatomical regions
74.78	197.16	31.89	67.55	69.56	968.77	57.74	731.12	**The wrist joint of the scoring arm**
69.23	189.11	33.55	61.22	46.75	587.66	21.38	123.33	**Knee joint for the lifting man**
58.61	179.62	29.21	56.41	39.06	533.17	19.51	117.12	**The ankle joint of the elevation man**
37.08	73.39	41.43	437.91	85.51	792.53	57.21	434.13	**Center of gravity**

Table 2. The arithmetic mean and standard deviation of the research sample in the mechanical variables and the accuracy of the two-point jump shot from specific areas within the basketball scoring zone at the moment of pivoting

Vertical speed Centimeter/second		Horizontal speed Centimeter/second		Vertical displacement Meter		Horizontal displacement Meter		Anatomical regions
Deviation	The middle	Deviation	The middle	Deviation	The middle	Deviation	The middle	
88.32	522.96	45.77	269.11	86.88	432.01	40.86	240.90	**Elbow joint of the scoring arm**
99.19	689.16	41.27	211.34	97.12	496.75	42.13	297.13	**The wrist joint of the scoring arm**
91.47	487.71	28.56	194.11	73.09	396.81	31.66	197.27	**Knee joint for the lifting man**
71.41	389.66	25.09	97.72	44.76	299.23	22.13	76.02	**The ankle joint of the elevation man**
88.59	411.74	58.32	389.68	85.51	667.27	51.22	322.67	**Center of gravity**

It is clear from tables (1) (2) that the average horizontal displacement was greater at the moment of pitching than at the moment of pivoting for the anatomical regions, the elbow joint of the pitching arm, the wrist joint of the pitching arm, the knee joint of the pitching man, and the ankle joint of the pitching man, The researcher attributes this to the fact that the moment of scoring requires the pitcher's arm in the form of an arc until the player flexes the elbow and wrist joint in the moment after the moment of anchoring, the elbow muscles are tightened and the wrist joint is tightened in order to maintain the speed of the ball, The knee joint leads to the transfer of force from the instep of the foot and the tightening of the ankle after the stop, which is the moment the ball leaves the throwing arm, while the horizontal speeds were all averaged above the elbow joint of the pitching arm, the wrist

joint of the pitching arm, the knee joint of the pitching man, and the knee joint of the pitching man, The centre of gravity of the same areas, the researcher attributes this to the height of the player's body is greater during flight. The moment the player leaves the ball, it requires braking in order to pivot so that the player can make a push to the fulcrum, which leads to a shift from horizontal displacement and velocity to vertical displacement and velocity to achieve the highest height during scoring. (2007.223.12)

Table 3. The arithmetic mean and standard deviation of the research sample on the mechanical variables and the accuracy of the three-point jump shot from specific areas outside the basketball scoring zone at the moment of scoring

Vertical speed Centimeter/second		**Horizontal speed Centimeter/second**		**Vertical displacement Meter**		**Horizontal displacement Meter**		**Anatomical regions**
Deviation	**The middle**	**Deviation**	**The middle**	**Deviation**	**The middle**	**Deviation**	**The middle**	
75.81	297.88	41.47	78.23	71.03	963.11	37.94	499.12	**Elbow joint of the scoring arm**
81.17	301.07	37.25	83.65	81.12	997.53	64.19	837.07	**The wrist joint of the scoring arm**
74.51	293.69	41.17	73.41	49.09	622.34	26.71	212.22	**Knee joint for the lifting man**
60.51	194.71	32.87	61.23	45.46	631.10	26.05	122.21	**The ankle joint of the elevation man**
36.98	466.52	41.43	455.73	89.31	819.27	63.06	487.67	**Center of gravity**

Table 4. The arithmetic mean and standard deviation of the research sample in the mechanical variables and the accuracy of the three-point jump shot from specific areas outside the basketball shooting zone at the moment of the pivot

Vertical speed Centimeter/second		**Horizontal speed Centimeter/second**		**Vertical displacement Meter**		**Horizontal displacement Meter**		**Anatomical regions**
Deviation	The middle	Deviation	The middle	Deviation	The middle	Deviation	The middle	
79.90	411.09	40.33	234.24	91.38	441.11	42.02	233.90	**Elbow joint of the scoring arm**
89.27	617.66	33.07	189.41	84.59	473.36	38.84	263.11	**The wrist joint of the scoring arm**
95.22	496.03	33.17	221.49	77.08	403.77	36.05	203.16	**Knee joint for the lifting man**

Vertical speed Centimeter/second		Horizontal speed Centimeter/second		Vertical displacement Meter		Horizontal displacement Meter		Anatomical regions
66.41	373.97	20.03	91.13	38.10	287.23	19.47	67.15	**The ankle joint of the elevation man**
83.29	398.81	55.03	379.86	81.12	671.06	54.16	345.21	**Center of gravity**

It is clear from tables (3) (4) that the average horizontal displacement was greater at the moment of aiming than at the moment of anchoring for the anatomical regions, the elbow joint of the aiming arm, the wrist joint of the aiming arm with three points, the knee joint of the lifting man, and the ankle joint of the lifting man, The researcher attributes this to the fact that the distance from the target requires changing the positions of both the elbow and wrist joints as well as the knee and ankle joints to prepare for the goal requires greater momentum, vertical distance and a large vertical displacement, while the horizontal distance and displacement is less, due to the need for the jumping skill to perform vertically to reach the highest possible distance. As for the centre of gravity on the same areas, the researcher attributes this to the distance from the scoring area, which requires raising the centre of gravity to the highest height during flight, which leads to an effective and effective scoring position during scoring, so it requires the player to extend all working joints to obtain a suitable flight for scoring. (2006.152.11)

3.2 Presentation and Discussion of the Significance of the Differences Between the Correlation Coefficients of Horizontal Displacements in Mechanical Variables and Scoring Accuracy by Jumping Two Points from Specific Areas Within the Basketball Scoring Zone at the Moment of Scoring

Table 5. Significance of the differences between the correlation coefficient of horizontal displacements in two- and three-point shooting accuracy from specific areas inside and outside the basketball shooting zone at the moment of scoring

Significance of the differences	Scoring by jumping three points		Significance of the differences	Scoring by jumping for two points		Anatomical regions
	The logarithmic counterpart	Correlation coefficient		The logarithmic counterpart	Correlation coefficient	
0.47	0.436	0.217	0.21	0.322	0.127	**Elbow joint of the scoring arm**
0.57	0.486	0.297	0.39	0.431	0.223	**The wrist joint of the scoring arm**
0.20	0.315	0.121	0.19	0.310	0.112	**Knee joint for the lifting man**
0.16	0.289	0.118	0.17	0.206	0.96	**The ankle joint of the**

Significance of the differences	Scoring by jumping three points		Significance of the differences	Scoring by jumping for two points		Anatomical regions
	The logarithmic counterpart	Correlation coefficient		The logarithmic counterpart	Correlation coefficient	
						elevation man
0.37	0.431	0.413	0.29	0.341	0.322	**Center of gravity**

At a significance level of 2.45=0.05 R tabularity at my level 0.666= 0.05

It is clear from table (5) that there are significant correlations between the horizontal displacements of the selected anatomical areas in the accuracy of two-point and three-point jumping from specific areas inside and outside the basketball scoring area at the moment of scoring where the number of correlation coefficients reached (10) significant coefficients, and there is a direct relationship between two-point and three-point jumping for both methods of scoring and in favour of three-point jumping where the highest correlation coefficient reached (0. 297) between the wrist joint through two-point and three-point scoring and also reached the highest rate of significance of logarithmic differences (0.57), and the horizontal displacements of two-point scoring for the correlation coefficient for each of the joints (elbow, wrist) of the scoring arm (0.223, 0.127). (0.223,0.127) and the correlation coefficient for the joints (knee and ankle) of the riser (0.112,096), and the horizontal displacement of the riser was three points for the correlation coefficient for the joints (elbow, wrist) of the riser (0.217,0.297) and the correlation coefficient for the joints (knee and ankle) of the riser (0.121,0.0). 118), and the researcher attributes this to the fact that the greater the distance from the scoring area, the smaller the angle of flight, the greater the significant differences at the level of significance (0.05) for the scoring arm, while for the height man there are few differences between two-point and three-point scoring because the horizontal displacement is less compared to the vertical displacement, as compared to the vertical displacement. (2004.287.2)

Table 6. Significance of the differences between the correlation coefficient of horizontal velocity for two- and three-point jumpers from specific areas inside and outside the basketball scoring zone at the moment of scoring

Significance of the differences	Scoring by jumping three points		Significance of the differences	Scoring by jumping for two points		Anatomical regions
	The logarithmic counterpart	Correlation coefficient		The logarithmic counterpart	Correlation coefficient	
0.29	0.331	0.139	0.23	0.296	0.109	**Elbow joint of the scoring arm**
0.37	0.353	0.221	0.33	0.327	0.187	**The wrist joint of the scoring arm**

Significance of the differences	Scoring by jumping three points		Significance of the differences	Scoring by jumping for two points		Anatomical regions
	The logarithmic counterpart	Correlation coefficient		The logarithmic counterpart	Correlation coefficient	
0.23	0.262	0.141	0.17	0.213	0.87	**Knee joint for the lifting man**
0.21	0.211	0.97	0.16	0.195	0.79	**The ankle joint of the elevation man**
0.27	0.378	0.347	0.19	0.326	0.311	**Center of gravity**

At a significance level of 2.45=0.05 R tabularity at my level 0.666= 0.05

It is clear from table (6) that there are significant correlations between the horizontal velocities of the selected anatomical areas in the accuracy of scoring by jumping two and three points from specific areas inside and outside the basketball scoring area at the moment of scoring, as the number of correlation coefficients reached (10) significant coefficients, and there is a direct relationship between two and three point scoring for both methods of scoring and in favour of three point scoring where the highest correlation coefficient reached (0. 221) between the wrist joint through two-point and three-point aiming and also reached the highest rate of significance of the logarithmic differences (0.353), and the horizontal speeds of two-point aiming for the correlation coefficient for each of the joints (elbow, wrist) of the aiming arm (0. (0.109, 0.187), the correlation coefficient for the knee and ankle joints (0.87, 0.79), the horizontal velocity of the pitching arm (0.139, 0.221) and the correlation coefficient for the knee and ankle joints of the pitching leg (0.141, 0.141, 0.97). 97), and the researcher attributes this to the fact that the greater the distance from the scoring area, the smaller the angle of flight, the greater the significant differences at the level of significance (0.05) for the scoring arm, while for the climbing man there are few differences between two-point and three-point scoring because the horizontal speed decreases compared to the vertical speed (2000.202.3).

Table 7. Significance of the differences between the correlation coefficients of vertical displacement in mechanical variables and scoring accuracy with two- and three-point jumpers from specific areas inside and outside the basketball scoring zone at the moment of scoring

Significance of the differences	Scoring by jumping three points		Significance of the differences	Scoring by jumping for two points		Anatomical regions
	The logarithmic counterpart	Correlation coefficient		The logarithmic counterpart	Correlation coefficient	
0.41	0.341	0.231	0.28	0.312	0.189	**Elbow joint of the scoring arm**

Significance of the differences	Scoring by jumping three points		Significance of the differences	Scoring by jumping for two points		Anatomical regions
	The logarithmic counterpart	Correlation coefficient		The logarithmic counterpart	Correlation coefficient	
0.52	0.451	0.321	0.38	0.388	0.295	**The wrist joint of the scoring arm**
0.36	0.301	0.242	0.24	0.351	0.226	**Knee joint for the lifting man**
0.26	0.287	0.178	0.20	0.279	0.129	**The ankle joint of the elevation man**
0.34	0.283	0.276	0.39	0.367	0.237	**Center of gravity**

At a significance level of 2.45=0.05 R tabularity at my level 0.666= 0.05

It is clear from table (7) that there are significant correlations between the vertical displacements of the selected anatomical areas in the accuracy of two-point and three-point jumping from specific areas inside and outside the basketball scoring area at the moment of scoring, where the number of correlation coefficients reached (10) significant coefficients, and there is a direct relationship between two-point and three-point scoring for both methods of scoring and in favour of three-point scoring, where the highest correlation coefficient reached (0. 321) between the wrist joint through two-point and three-point aiming and also reached the highest rate of significance of logarithmic differences (0.451), and the horizontal speeds of two-point aiming for the correlation coefficient for both joints (elbow, wrist) of the aiming arm (0. (0.189, 0.295), the correlation coefficient for the knee and ankle joints (0.226, 0.129), the horizontal velocity of the pitching arm (0.231, 0.321) and the correlation coefficient for the knee and ankle joints of the pitching arm (0.178, 0.242). This shows us that the vertical displacement increases because the body at the moment of aiming, so the angle of flight increases. Significant differences increase at the level of significance (0.05) for the aiming arm, while for the climbing man there are few differences between two-point and three-point aiming because the vertical displacement is limited due to the kinetic transfer of the trunk (2003.78.7).

Table 8. Significance of the differences between the correlation coefficients of vertical velocity in the mechanical variables and scoring accuracy in two-point and three-point jumpers from specific areas inside and outside the basketball scoring zone at the moment of scoring

Significance of the differences	Scoring by jumping three points		Significance of the differences	Scoring by jumping for two points		Anatomical regions
	The logarithmic counterpart	Correlation coefficient		The logarithmic counterpart	Correlation coefficient	
0.53	0.459	0.397	0.44	0.389	0.276	**Elbow joint of the scoring arm**

Significance of the differences	Scoring by jumping three points		Significance of the differences	Scoring by jumping for two points		Anatomical regions
	The logarithmic counterpart	Correlation coefficient		The logarithmic counterpart	Correlation coefficient	
0.74	0.723	0.579	0.69	0.501	0.358	**The wrist joint of the scoring arm**
0.46	0.272	0.323	0.39	0.379	0.249	**Knee joint for the lifting man**
0.25	0.253	0.211	0.29	0.354	0.231	**The ankle joint of the elevation man**
0.57	0.411	0.475	0.71	0.587	0.396	**Center of gravity**

At a significance level of 2.45=0.05 R tabularity at my level 0.666= 0.05

It is clear from table (8) that there are significant correlations between the vertical velocities of the selected anatomical areas in the accuracy of two-point and three-point jumping from specific areas inside and outside the basketball scoring area at the moment of scoring, as the number of correlation coefficients reached (10) significant coefficients, and there is a direct relationship between two-point and three-point scoring for both methods of scoring and in favour of three-point scoring, as the highest correlation coefficient reached (0. 579) between the wrist joint through two-point and three-point stroking and also reached the highest rate of significance of logarithmic differences (0.723), and the vertical velocities of two-point stroking for the correlation coefficient for both joints (elbow, wrist) of the stroking arm (0. (0.276, 0.358), the correlation coefficient for the knee and ankle joints (0.249, 0.231), the vertical velocity of the shot was three points for the correlation coefficient for the elbow and wrist joints (0.397, 0.579), and the correlation coefficient for the knee and ankle joints (0.211, 0.0) for the elevation man (0.211, 0. 323), this shows us that the vertical velocity increases because the body at the moment of aiming, so the angle of flight increases. Significant differences increase at the level of significance (0.05) for the aiming arm, while for the climbing man there are few differences between two-point and three-point aiming because the vertical velocity is very high for three-point aiming due to the large angle of flight, which allows a high kinetic field for the aiming (2011.312.5).

3.3. Presentation and Discussion of the Significance of Differences in Correlation Coefficients: Horizontal Displacements in Mechanical Variables and Scoring Accuracy of Two-Point Jump Shots from Specific Areas Inside and Outside the Basketball Scoring Zone at the Moment of Pivoting

Table 9. Significance of the differences between the correlation coefficients of the horizontal displacements in the mechanical variables and the scoring accuracy of two- and three-point jumping from specific areas inside and outside the basketball scoring zone at the moment of pivot

Significance of the differences	Scoring by jumping three points		Significance of the differences	Scoring by jumping for two points		Anatomical regions
	The logarithmic counterpart	Correlation coefficient		The logarithmic counterpart	Correlation coefficient	
0.15	0.278	0.157	0.16	0.287	0.117	**Elbow joint of the scoring arm**
0.27	0.314	0.301	0.31	0.312	0.201	**The wrist joint of the scoring arm**
0.13	0.276	0.111	0.11	0.259	0.99	**Knee joint for the lifting man**
0.13	0.165	0.98	0.09	0.178	0.74	**The ankle joint of the elevation man**
0.41	0.369	0.322	0.38	0.352	0.311	**Center of gravity**

At a significance level of 2.45=0.05 R tabularity at my level 0.666= 0.05

It is clear from table (9) that there are significant correlations between the horizontal displacements of the selected anatomical areas in the accuracy of two-point and three-point jumping from specific areas inside and outside the basketball scoring area at the moment of pivoting, where the number of correlation coefficients reached (10) significant coefficients, and there is a direct correlation for two-point and three-point jumping for both methods of scoring and in favour of three-point jumping where the highest correlation coefficient reached (0. 301) between the wrist joint through two-point and three-point scoring and also reached the highest rate of significance of logarithmic differences (0.314), and the horizontal displacements of two-point scoring for the correlation coefficient for each of the joints (elbow, wrist) of the scoring arm (0. (0.201, 0.117) and the correlation coefficient for the joints (knee, ankle) of the pitching arm (0.74, 0.99), and the horizontal displacement of the pitching arm (0.157, 0.301) and the correlation coefficient for the joints (knee, ankle) of the pitching arm (0.98, 0.0). 111), this shows that the greater the distance from the scoring area, the smaller the angle of flight, the greater the significant differences at the level of significance (0.05) for the scoring arm, while for the height man there are few differences between scoring two and three points because the horizontal displacement is less compared to the vertical displacement (2006.373.8).

Table 10. Significance of the differences between the correlation coefficients of horizontal velocity in mechanical variables and scoring accuracy in two- and three-point jumpers from specific areas inside and outside the basketball scoring zone at the moment of pivoting

Significance of the differences	Scoring by jumping three points		Significance of the differences	Scoring by jumping for two points		Anatomical regions
	The logarithmic counterpart	Correlation coefficient		The logarithmic counterpart	Correlation coefficient	
0.38	0.340	0.153	0.27	0.303	0.119	**Elbow joint of the scoring arm**
0.44	0.365	0.247	0.36	0.336	0.197	**The wrist joint of the scoring arm**
0.29	0.272	0.162	0.22	0.224	0.93	**Knee joint for the lifting man**
0.23	0.217	0.108	0.19	0.209	0.85	**The ankle joint of the elevation man**
0.39	0.383	0.355	0.28	0.337	0.319	**Center of gravity**

At a significance level of 2.45=0.05 R tabularity at my level 0.666= 0.05

It is clear from table (10) that there are significant correlations between the horizontal velocities of the selected anatomical regions in the accuracy of two-point and three-point jumping from specific areas inside and outside the basketball scoring area at the moment of pivoting, where the number of correlation coefficients reached (10) significant coefficients, and there is a direct relationship between two-point and three-point jumping for both methods of scoring and in favour of three-point jumping, where the highest correlation coefficient reached (0. 247) between the wrist joint through two-point and three-point stroking and also reached the highest significance rate of logarithmic differences (0. 365), the horizontal velocity of the two-point shot for the correlation coefficient for the elbow and wrist joints of the shooting arm (0.119, 0.197), the correlation coefficient for the knee and ankle joints (0.93, 0.85), the horizontal velocity of the three-point shot for the correlation coefficient for the elbow and wrist joints of the shooting arm (0.153, 0.247), and the horizontal velocity of the three-point shot for the correlation coefficient for both joints (elbow, wrist) of the shooting arm (0. (0.153, 0.247) and the correlation coefficient for the joints (knee, ankle) of the lifting leg (0.108, 0.162), this shows us that the farther the distance from the scoring area, the lower the angle of flight and the more significant the differences at the level of significance (0.05).

Table 11. Significance of the differences between the correlation coefficients of vertical displacement in mechanical variables and scoring accuracy in two- and three-point jumpers from specific areas inside and outside the basketball scoring zone at the moment of pivoting

Significance of the differences	Scoring by jumping three points		Significance of the differences	Scoring by jumping for two points		Anatomical regions
	The logarithmic counterpart	Correlation coefficient		The logarithmic counterpart	Correlation coefficient	
0.41	0.361	0.241	0.33	0.378	0.193	**Elbow joint of the scoring arm**
0.52	0.474	0.343	0.47	0.398	0.336	**The wrist joint of the scoring arm**
0.36	0.319	0.277	0.28	0.367	0.247	**Knee joint for the lifting man**
0.26	0.293	0.183	0.23	0.291	0.179	**The ankle joint of the elevation man**
0.40	0.301	0.290	0.49	0.386	0.286	**Center of gravity**

At a significance level of 2.45=0.05 R tabularity at my level 0.666= 0.05

It is clear from table (11) that there are significant correlations between the vertical displacements of the selected anatomical areas in the accuracy of two-point and three-point jumping from specific areas inside and outside the basketball scoring area at the moment of pivoting, where the number of correlation coefficients reached (10) significant coefficients, and there is a direct relationship between two-point and three-point jumping for both methods of scoring and in favour of three-point jumping, where the highest correlation coefficient reached (0. 343) between the wrist joint through two-point and three-point stroking and the highest correlation coefficient of significance for logarithmic differences was (0. 474), the horizontal velocities of the two-point shot for the correlation coefficient for the elbow and wrist joints of the shooting arm (0.193, 0.336), the correlation coefficient for the knee and ankle joints (0.241, 0.343), and the vertical displacement of the three-point shot for the correlation coefficient for the elbow and wrist joints of the shooting arm (0.241, 0.343), and the vertical displacement of the three-point shot for the correlation coefficient for the elbow and wrist joints of the shooting arm(0. (0.241, 0.343) and the correlation coefficient for the joints (knee, ankle) of the climbing man (0.183, 0.277), this shows that the vertical displacement increases because the body at the moment of aiming, thus increasing the angle of flight increases the significant differences at the level of significance (0.05)

Table 12. Significance of the differences between the correlation coefficients of vertical velocity in the mechanical variables and scoring accuracy in two- and three-point jumpers from specific areas inside and outside the basketball scoring zone at the moment of pivoting

Significance of the differences	Scoring by jumping three points		Significance of the differences	Scoring by jumping for two points		Anatomical regions
	The logarithmic counterpart	Correlation coefficient		The logarithmic counterpart	Correlation coefficient	
0.54	0.462	0.422	0.45	0.395	0.281	**Elbow joint of the scoring arm**
0.68	0.677	0.587	0.63	0.497	0.365	**The wrist joint of the scoring arm**
0.41	0.271	0.342	0.41	0.380	0.257	**Knee joint for the lifting man**
0.27	0.255	0.226	0.33	0.366	0.242	**The ankle joint of the elevation man**
0.53	0.407	0.467	0.69	0.522	0.407	**Center of gravity**

At a significance level of 2.45=0.05 R tabularity at my level 0.666= 0.05

It is clear from table (12) that there are significant correlations between the vertical velocities of the selected anatomical areas in the accuracy of two-point and three-point jumping from specific areas inside and outside the basketball scoring area at the moment of pivoting, as the number of correlation coefficients reached (10) significant coefficients, and there is a direct relationship between two-point and three-point scoring for both methods of scoring and in favor of three-point scoring, as the highest correlation coefficient reached (0. 587) between the wrist joint through two-point and three-point stroking and also reached the highest rate of significance for logarithmic differences, where the highest correlation coefficient (0. 677), the vertical velocities of the two-point aiming for the correlation coefficient for both joints (elbow, wrist) of the aiming arm (0.281, 0.365), the correlation coefficient for the joints (knee, ankle) at the moment of aiming (0.257, 0.242), the vertical velocity of the three-point aiming for the correlation coefficient for both joints (elbow, wrist) of the aiming arm (0.422, 0.587), the vertical velocity of the three-point aiming for the correlation coefficient for both joints (elbow, wrist) of the aiming arm (0. (0.422, 0.587) and the correlation coefficient for the joints (knee, ankle) of the climbing man (0.226, 0.342), this shows us that the vertical velocity increases because the body at the moment of aiming, thus increasing the angle of flight increases the significant differences at the level of significance (0.05).

3.4 Discussion of Results:

It is clear from tables (5) (6) that the results of the correlation coefficients as well as the results of the significance of the logarithmic differences of the horizontal and vertical

displacements at the moment of scoring were all in favor of the three-point shot, and the researcher attributes this to the fact that the three-point shooting technique involves the motor transfer mechanism from the lower body (wrist and ankle joints) with the stabilization of the leg Then the weight of the ball-bearing arm comes through the jaw of the body upwards, where the scoring arm is extended towards the basket at the end of the moment the foot rests on the ground, and the accuracy of scoring is affected by the position of the body, especially the lower limbs, because the lower limb represents the base of the body's fulcrum at the moment the foot rests, There is a rule that says that the more the body's balance is maintained, the more it affects the strength and accuracy of the performance as a result of the stability of the centre of gravity during the performance. (2005.59.9)

It also agrees with what(Luplaud) stated that stability helps to stabilize balance and thus gains kinetic energy for the upper limbs as a result of kinetic transfer from the trunk to the pitching arm (2006.147.10).

It is also clear from tables (7) (8) that all the significance of the logarithmic differences between the correlation coefficients of the horizontal and vertical velocities of the strength and accuracy of the three-point shot, because during pivoting the body releases the stored energy due to the extension of the trunk and throwing arm and the large angle of flight leads to an advantage in the flight sector, which leads to a successful and smooth shot (2005, p. 88.9). Tables (1) and (2) show that the average horizontal displacement was greater at the moment of goal than at the moment of pivot, and as a result of that pivot, the player's horizontal and vertical velocity is braked so that the player can adjust his body position to obtain the highest power and best scoring accuracy in the basketball.

It is clear from Tables (10, 9) that the results of the correlation coefficients and the significance of the logarithmic differences between the correlation coefficients of the horizontal and vertical displacements of the strength and accuracy of the jump shot with two and three points from specific areas inside and outside the basketball shooting area at the moment of pivoting, the researcher attributes this to the fact that the jump shot requires a set of preparatory movements, these movements are some in the direction of the main movement, which is the preparatory position for the skill of jump shot until the basketball rests, whether it is the upper or lower corners, this requires the torso to bend forward with a slight departure of the body's centre of gravity. The upper or lower corners require bending the torso forward with a slight departure of the body's centre of gravity outwards, while in our research here the ball is moving, and this is consistent with (Gerd and Khemoth) where they said that scoring in basketball requires that it be in the direction of the main phase of the movement represents a secondary preparatory phase that prepares and prepares for the original introductory phase, and this double phase is considered as a main phase and is considered a single triple movement, that is, it has a preparatory phase, a main phase and a follow-up phase. (2000.109.3)

As shown in Tables (11) (12), there are significant differences between the correlation coefficients of the horizontal velocities in the accuracy of two-point and three-point jump shots from specific areas inside and outside the basketball scoring area at the moment of pivoting, where most of the significant signs of the logarithmic differences were in favor of three-point shots from outside the scoring area, and the researcher attributes this to the fact

that The three-point shot differs from the two-point shot in that in order for the player to make the shot to go in the form of an arc, he must twist the instep of the shooting foot inward at a high speed, unlike the position of the wrist, which is inward, the researcher also attributes this to the rotation of the torso outward in order to maintain the balance of the body during the rotation process in the shooting position (2003. 97.7), as evidenced by the This is confirmed by(Andy Blass), who said that the motor performance of shooting as a single motor system is characterized by automation, speed and accuracy in performance. (20041.119.2) (Hewitt) also says that the human body is an integrated unit where the muscles of the kinetic chain not only work during a specific and accelerated movement of this chain, but this is accompanied by other muscular work to stabilize other parts of the body so that the parts to be moved can move with strength and speed and so that the movement is carried out with precision. (2006.114.8).

This answers the second research question: Are there significant correlations between the horizontal and vertical displacements and velocities of the power and accuracy of two- and three-point jumpers from specific areas inside and outside the basketball scoring zone at the moment of scoring.

Conclusion

1. That the mean horizontal displacements of three-point shots are greater than two-point shots at the moment of pivot.
2. The significance of the logarithmic differences between the correlation coefficients of the horizontal and vertical displacements of the strength and accuracy of two-point and three-point shooting from specific areas inside and outside the basketball scoring zone at the moment of scoring.
3. The significance of the logarithmic differences between the correlation coefficients of the horizontal and vertical velocities of the strength, accuracy, and precision of two-point and three-point shooting from specific areas inside and outside the basketball shooting zone at the moment of scoring is in favor of three-point shooting.
4. The significance of the logarithmic differences between the correlation coefficients of the horizontal and vertical displacements of the strength, accuracy and precision of the two-point and three-point jump shot from specific areas inside and outside the basketball scoring zone at the moment of the shot in favor of the three-point shot.
5. The significance of the logarithmic differences between the correlation coefficients of the horizontal and vertical velocities of the strength, accuracy and precision of two-point and three-point shooting from specific areas inside and outside the basketball scoring zone at the moment of scoring is in favor of three-point shooting.

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