

Research Article

The Effects of Technical Training on Basketball Speed Dribbling Skill and Stationery Two-point Shot Skill of Male University Sport Science Department Students

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Abstract

The purpose of this study was to investigate the effect of technical training on basketball speed dribbling skill and stationery two-point shot in Madda Walabu University male third-year sport science students. Twenty-eight (28) male sport science students were selected by the census sampling method. For this study, a quantitative research method was used. Because this method involves measurable quantities, this would give you a set of numerical data. A pretest-and-posttest randomized experimental design was employed. The experimental group underwent a basketball technical training program for eight weeks but the control group did not receive basketball technical training interventions. The level of significant was set at $p < 0.05$. Statistically significant difference have been detected between the pre-test and post-test values on experimental group in speed dribbling ($p = 0.01$) and stationary two-point shooting skills ($p = .000$) registered statistically significant difference. The results of the study showed that providing systematic and gradual increment of both duration and intensity of basketball technical training with in eight-weeks intervention, statistically significant improvements and changes were observed in the students speed dribbling and stationary two-point shooting skills. The researcher concluded that regular participation in basketball technical training had a significant effect on the improvement and enhancement of basketball speed dribbling and stationary two-point shooting skill performances. Further study shall be done by increasing basic basketball skills through increasing subjects and taking a maximum period of training duration (increasing subjects and adding basic basketball skills require a long period of time with a well-programmed training schedule).

Keywords

Speed Dribbling, Stationery Two-point Shot, Technical Training

1. Introduction

Basketball requires the mastery of numerous skills that are dependent on the proper development of fundamental motor skills and fundamental game skills, which are thought to be the foundation of physical literacy training [1]. A player at

any level of play needs to be physically fit in order to play a successful game of basketball.

Basketball is known for requiring short bursts of activity, so players must be in excellent physical shape in terms of

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their aerobic and anaerobic capacity. Additionally, it exhibits rapid transitions from successive attacks to defenses. Basketball players also have access to a wide range of technical actions, which help to create offensive and defensive actions. These actions include dribbling and sprinting [8].

The game of basketball requires a variety of talents that are closely related to actions, neurological, mental, and motor skills, as well as control over movement. This interaction enables the player to execute the skills in a certain manner to guarantee performance improvement and precision [15]. This type of intelligence must be controlled, compatible, and balanced during the performance of the skills including basketball chest passing skill. This study was also help learners gain new skills and improve their passing skill when they pass accurately [15].

The technical parts of Basketball are catching; throwing, dribbling, and shooting are the main components. Basketball is an intermittent sport that involves high-intensity, repetitive accelerations, decelerations, direction changes, and jump landings, which puts a lot of strain on players' physical and mental capacities [19].

To move the ball quickly up the floor uses the "speed dribble". Push the ball forward, ahead of you several feet. Bounce the ball at least waist high. Keep your head up, and visualize the whole court, so you can find the open teammate [17].

Basketball requires the mastery of numerous skills that are dependent on the proper development of fundamental motor skills and fundamental game skills, which are thought to be the foundation of physical literacy training [1]. A player at any level of play needs to be physically fit in order to play a successful game of basketball.

Dribbling is the act of bouncing the ball continuously with one hand, and is a requirement for a player to take steps with the ball [21]. When an athlete bounces the ball with one hand onto the court and touches it again before another athlete touches it, they are dribbling, which allows them to move with the basketball [4].

Dribbling is one of the essential attacking skills in basketball, which involve control over the ball by one hand, bouncing, controlling the ball in static or dynamic condition, and frequently changing the direction at a faster rate [22].

The first aspect of the game to be taught should be the principles of dribbling a basketball. The majority of basketball players find this skill and shooting to be the most enjoyable aspects of the game. We frequently witness young players emulating their NBA heroes with intricate ball handling, but they are frequently unaware that there are only two legitimate reasons to dribble the ball. However, if the defense is tight and the passing lanes are blocked, the dribble is used to set up the offense. It is used to penetrate the ball (toward the basket) and to generate a better passing angle [3].

Basketball players need to work on their left- and right-handed dribbling techniques. 90% of players are right-handed, thus we term to this as their favorite hand and advise

players to practice using their non-preferred hand and urge them to do so when playing. "Strong-weak hand" or "good-bad hand" are terms used to describe hands in the void. Improve your right- and left-hand dribbling for the benefit of all players [9].

Dribbling is one of the most important skills to learn. It's important to master good dribbling techniques and to understand when and when not to dribble. One player's excessive dribbling can completely derail a team's offensive motion and momentum. If you want to become a better ball handler and dribbler, you should practice as regularly as you can. A player may only advance with the ball two steps at a time; thus, trainer must move swiftly to pass or shoot. But the trainer can move with the ball by dribbling. A good dribbler should be able to: push the ball to the ground with control; straighten the elbow and follow through with the wrist; keep the hand and fingers slightly curved to match the curve of the ball; spread the fingers to gently slow the ball's momentum; and, as the ball is sucked up, relax the forearm before pushing down again [2].

The speed dribble is used to move the ball quickly down the court toward the hoop in which the team scores (such as in a fast break) [14]. A speed dribble is performed by pushing the ball out in front (and to the outside) of the foot on the same side as the dribbling hand, and the ball bounces around waist height with the dribbler. Athletes must push the ball as far as possible while maintaining control of the ball and their bodies [14]. Once you're in the open court, you need to move with the ball as quickly as you can while still keeping both your body and the ball under control. Maintaining top speed is more important in this situation than keeping the ball from the defenders because you are not being closely guarded.

As you run faster, you must push the ball farther in front of you. Since your hand is behind the ball instead of directly above it as in the low dribble, you may push the ball firmly and forward with your arm fully extended (at almost a 45-degree angle to the floor). To keep possession of the ball while you run down the court, you must dribble high [6].

Shooting is the act of attempting to score points by putting the ball through the basket, with different strategies used depending on the player and the circumstance [21]. Basketball competitions have the goal of outscoring the opposition, emphasizing how crucial it is for players and teams to show accurate shooting. According to research, when a team outperforms the opposition in terms of two-point and three-point shooting accuracy, their chances of winning go up [4].

According to [9], the feet should be pointed at the target (the ring or the vertical line on the side of the small rectangle on the backboard for a shot close in on the side of the ring) and spread apart for balance. The knee must be flexed for power (most of the power comes from the time leg), elbow under the ball and pointed at the target.

To shot the ball the player pushes with his leg followed immediately by pushing his elbow upwards toward the target until the arm is fully extended and as the ball release from

the fingers. A player shoots the ball by first pushing with his leg, then extending his elbow up and toward the target until the arm is fully extended. As the ball releases from the shooting hand's fingers, the player breaks his wrist downward to impart backspin while keeping fingers apart. The shooting hand's wrist needs to be level and pointing at the target as soon as the ball is released (follow throw) [5].

Five separates, connected steps make up the jump shot technique: The body is lowered into a strong position in the first phase, which is known as the preparation phase, in order to become ready to jump off the ground. The second part of the shot involves elevating and controlling the basketball so that it is at eye level. In the third stage, known as the stability phase, a counter movement jump (CMJ) is executed, which causes both feet to lose touch with the court. The ball is released from the hands during the fourth phase, known as the release phase, before the last phase, known as the follow-through, in which both feet are brought back to the court while the hands remain directed at the basket [13]. This series of actions emphasizes how the jump shot is dynamic, which is further influenced by the constant variability in shooting locations and distances during game play. Jump shots from various positions and distances on the court have been noted to vary in technique. In a prior study, athletes attempted ten jump shots in a random order from close (2.8 meters), midrange (4.8 meters), and long (6.6 meters) distances to see how shooting technique changed as distance increased [12].

Athletes typically decrease the release height while increasing the angle and velocity applied to the basketball during the skill's release phase when shooting from a longer distance [12]. Athletes who consistently shoot accurately despite high levels of variability show task adaptation, which can improve successful performance results [4]. Therefore, it is essential to evaluate accuracy from several shooting locations and distances in order to fully measure an athlete's jump shooting accuracy while representing the shooting patterns and task variability typically observed during game-play.

2. Materials and Methods

2.1. Description of the Study Area

Robe, also called Bale Robe, is a town in south-central Oromia Region, Ethiopia located in the Bale Zone. It is located about 430 kilometers by road from the capital city, Addis Ababa. Mada Walabu University is one of the higher educational institutions located in the south-eastern part of Ethiopia, in Bale Zone.

2.2. Sampling Method and Strategy

The researcher selected the entire population of Mada Walabu University male third-year sport science students

using the purposive sampling method. The health history questionnaires were prepared for those male students to identify whether they are free from diseases such as diabetes, stroke, musculoskeletal injury, hypertension, and cardiovascular disease (CVD). Simple random sampling techniques were used to assign 14 experimental and 14 control groups after recording the pre-test results. All students selected to participate in the study were with good health conditions.

2.3. Study Design and Methodology

2.3.1. Basketball Technical Training Protocol

The necessary data were collected qualitatively from pre-test and post-test results from experimental and control groups. The training period lasted for eight-weeks. Study participants were participated for basketball technical training having different stations was developed by the research scholar, and the subjects was trained for the first three consecutive weeks (30 minutes and 3 days per week), for the second three consecutive weeks (40 minutes and 4 days per week), and for the last two consecutive weeks (50 minutes and 5 days per week) for eight weeks.

In the training schedule, basketball technical training was included the training like: dribbling training to improve student's speed dribbling skill and passing training to improve student's chest passing skill. The training method was repetition (the act of repeating the skill) and interval (repetitions of work with a rest period). The researcher was used heart rate monitor to control students training intensity.

2.3.2. Speed Dribbling Test

Purpose: - to evaluate skill in ball handling with obstacles while moving.

Procedure: - With the signal "go," the subject picks up the ball and dribbles forward and back through the line of hurdles put on half of the given distance. Four chairs were placed in a straight line six feet apart. The first obstacle would be 12 feet apart from the starting line, which was 6 feet wide. The watch was started with the signal "go" and stops as the subject returns to the start-finish line. Watching, signals, and balls were used in this test.

Scoring: The score was counted as the total number of seconds from the command "go" until the subject returns to the start-finish line [9].

2.3.3. The Stationary Two-point Shooting Test

Purpose: - to measure the students' proficiency in shooting from various angles and predetermined places.

According to [20] stationary two-point shot assessments had greater absolute reliability than three-point assessments, demonstrating a higher degree of consistency in individual shooting accuracy from closer ranges.

Procedure: - In one of three series, each participant executed two jump shots from five different positions, for a total

of ten shots. The player would begin the test on the right wing. The shooting locations were placed five meters out from the center of the hoop's vertical floor projection. The shots were not having a time limit. Two additional players were intercepted the ball and return it to the test. There was a three-minute break in between each shooting series.

Scoring: - For every shot that was made successfully, athletes were awarded one point. The average% from all three trials was utilized for analysis [4].

2.3.4. Data Quality Control

To ensure the quality of the data, only the most common basketball dribbling skill tests were used. The assistant skill test recorders were trained to collect the appropriate data in order to reduce errors during data collection. Furthermore, all of the aforementioned tests were videotaped and photographed for further verification of the test procedure. In order to obtain a true result, the data was managed by the researcher's prudence when gathering data. Even before the quality control stage, quality control was significantly improved data usability and helps reduce time and effort waste throughout the entire research work flow.

To ensure data quality, all the test procedures, collection of data, and handling of information was carried out in accordance with standard protocols and measurements. And the researcher was used an assistant to collect data. The test measurements were taken with the same examines. The researcher was created awareness for subjects about the test and recommended preconditions, which they tried to do prior to taking the test.

Furthermore, the researcher was tried to inform the control groups that they are not participating in training or exercises beyond their regular training given by their course instructor so as to control them and increase the validity and reliability of the test results. Finally, the data was coded and fed to the software twice, with different experts handling it to avoid

errors in data feeding.

2.3.5. Ethical Consecrations

Ethical standards were required that researchers not put participants in a situation where they might be at risk of harm as a result of their participation. All of the participants have clear information about the purpose of the study and give a signed agreement to participate in it, and they were free from different diseases. The written consent/agreement form was given to and distributed to the relevant bodies. Each participant was allocated a number and alphabetical code to ensure that confidentiality and anonymity is maintained.

2.3.6. Data Analysis

The collected data were analyzed using statistical package software for social science (SPSS) version 20. Paired t-test and independent t-test were used for data analysis. The level of significant was set at $p < 0.05$. The characteristics of study participants mean and standard deviation (SD) of sex, age (yr.), weight (Kg), height (m) and basketball playing experience of the students $1.00 \pm .000$, 2.32 ± 1.278 , $1.89 \pm .786$, $2.46 \pm .922$ and $1.00 \pm .000$ respectively.

Experimental and control groups data analyzed within-groups by paired t-test and between-group effects analyzed by independent t-test design were applied during pre-test and post-test of training interventions'.

3. Results

After collecting the reliable data through experimental methods such as pre and post-test of each variable, the researcher tabulated, analyzed and interpreted it. Tabulation is a way of arranging the same data in some kind of concise and logical order.

Table 1. The mean and standard deviation value of basketball speed dribble and stationery two-point shot skill between experimental and control groups.

Variables	Tests	Experimental group		Control group	
		Pre-test	Post –test	Pre-test	Post –test
		$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$
Dribbling	Speed dribble	2.71 ± 1.139	$1.14 \pm .363$	3.71 ± 1.069	$3.71 \pm .726$
Shooting	2-point stationary shoot	1.93 ± 1.072	$4.50 \pm .760$	$1.43 \pm .852$	$1.29 \pm .469$

The mean values of the speed dribbling Pre-test and Post-test results of the experimental groups were 2.71 ± 1.139 and $1.14 \pm .363$. Whereas the mean values of the control group

speed dribbling test, were 3.71 ± 1.069 and $3.71 \pm .726$. After an eight-week basketball technical training intervention, the students' mean value of basketball speed dribbling skill test

results was increased when compared to pre-test results. i.e., the mean of EG decreased from pre-test to post-test from 2.71 to 1.14 (since the trainers who can cover the given distance with a zigzag dribble in a short period of time have a good performance) due to the stated interventions. Thus, we can conclude that eight-week basketball technical training in experimental groups shows a positive effect. But the students' basketball speed dribbling skill test results in the control group was not increased, as shown in the above result. i.e., the mean of CG was the same from pre-test to post-test, which is 3.71.

The mean values of stationery two-point shot skill test of Pre-test and Post-test results of the experimental groups were

1.93 ± 1.072 and $4.50 \pm .760$. Whereas the mean values of the control group of stationery two-point shot skill test, were $1.43 \pm .852$ and $1.29 \pm .469$. After eight-weeks of basketball technical training, the mean result of students' basketball stationery two-point shot skill test showed that there is an increment from pre to post-test results. i.e., the mean of EG increased from pre-test to post-test from 1.93 to 4.50 due to the programed eight-weeks of basketball technical training. Thus, anyone can conclude that eight-week basketball technical training in experimental groups shows a positive effect. But no change is observed in the control group, as shown in the above result.

Table 2. Comparing pre- and post-test results of basketball speed dribbling and stationery two point shot skills of students in controlled and experimental groups.

Variables	Group	Pre-test to Post-test	t	p
		$\bar{x} \pm SD$		
Sped dribbling	Experimental group	-1.571 ± 1.284	4.580	.001
	Control group	$.000 \pm 1.519$	.000	1.000
Stationery two-point shooting	Experimental group	2.571 ± 1.284	7.494	.000
	Control group	$.143 \pm .864$	.618	.547

The above Table 2 demonstrates that the pre and post-test results of speed dribble skill showed a statistically significant difference in the experimental group because the p value is less than 0.05, which is 0.01. But there was no significant change in the control group as shown in the table above, i.e., the p value is greater than 0.05, which is 1.000. From this, the researcher concluded that eight-weeks programed basketball technical training had statistically significant improvement in the experimental group. But the control group does not. This training plays a great role in students' selection of basic basketball skill variables. Due to this reason the alternative hypothesis was accepted.

The experimental group has been significantly improved ($P = 0.000$) on the students stationary two-point shoot skill

by the stated eight-weeks basketball technical training. So that the experimental group shows a statistically significant difference ($P = 0.00$) between pre and post measurements, this means that the eight-weeks basketball technical training intervention was vital for the improvement of the trainers stationary two-point shoot skill since the p value of the experimental group is less than 0.05. But the control group has not significantly improved ($p = 0.547$) on the students stationary two-point shoot skill, as shown in the above table. This indicates that without programed basketball technical training; it is difficult to get the desired improvement from students. Due to this reason, the alternative hypothesis was accepted.

Table 3. The results of Levine's Test for Equality of Variances Levine's for post-test results of experimental and control group of students.

Variables	Group	Pre-test to Post-test	t	P
		$\bar{x} \pm SD$		
Sped dribbling	Experimental group	$-2.571 \pm .217$	-11.849	.000
	Control group	$-.684 \pm 1.079$	-.634	.532
Stationery two-point shooting	Experimental group	$3.214 \pm .239$	13.474	.000

Variables	Group	Pre-test to Post-test	t	P
		$\bar{x} \pm SD$		
	Control group	1.893 $\pm$ 1.714	1.105	.279

The results of Levine's Test for Equality of Variances from Table 3 showed that there is a significant difference ($P = 0.000$) between the experimental and controlled groups for the speed dribbling skills of the students. So, the intervention of programmed eight-week basketball technical training showed a statistically significant difference between the experimental and controlled groups on the student's basketball speed dribbling skill, since the p value between the two groups is less than 0.05.

The results of Levine's Test for Equality of Variances from Table 3 showed that there is no significant difference ($P = .532$) between the experimental and controlled groups for the pre-test results of students speed dribbling skills, since the p value between the two groups is greater than 0.05.

There is a significant difference ($P = 0.000$) in basketball shooting (stationary two-point shot skill) between the experimental and controlled groups. So, the intervention of programmed basketball technical training showed that there is a statistically significant difference between the experimental and controlled groups on students shooting (stationary two-point shot skill), since the p value between the two groups is less than 0.05.

There was no significant difference ($P = .279$) in pre-test result of basketball shooting (stationary two-point shot skill) between the experimental and controlled groups. So, before participating programmed basketball technical training showed that there was no statistically significant difference between the experimental and controlled groups on students shooting (stationary two-point shot skill), since the p value between the two groups was greater than 0.05.

4. Discussion

The presented study investigated the effects of basketball technical training on students' performance on selected basic basketball skills of young male sport science students at Madda Walabu University. The scientific management of basketball is a very important development trend, according to the current level of basketball in China [23]. In order to raise the level of Chinese basketball, both coaches and athletes should take advantage of the chance for growth and study. According to research by [11], a training program that includes technical training for the development of skills improves players' skill levels and increases the precision and speed of their performance. So that in order to build basketball performance skill, a regular technical physical training program should be beneficial.

A high level of basketball skill is required for match play, which involves passing, dribbling, and shooting.

From the data, one can understand that programmed basketball technical training had a significant positive effect on the experimental group when compared to the control group. So that one can understand that eight-week programmed basketball technical training has a positive effect on trainers speed dribble and stationery two-point shoot skills. ($P = 0.05$), indicating that the group members who had basketball technical training programs (experimental groups) significantly outperformed than those in control groups.

4.1. On Speed Dribbling

Hussen et al [9], used the experimental approach, which resulted in the most important results showing that technical training leads to improvement of the basic skill, while adapting the technical training with the direction of speed dribbling skills leads to improvement of the ball-handling rate. The previous study by [18] supported the effect of technical training on basketball speed dribbling skills. [11], also found that the training program, which contains basketball technical training for the development of ball handling drills, led to the improvement of the skillful performance of the students and increased basketball speed dribbling skills.

The findings of the study showed that in the case of speed dribbling, the experimental group's significant improvement was observed after the intervention of eight-week technical training, but there was no significant improvement in the control group. So that significant differences could be observed, the alternative hypothesis was accepted.

The training program that includes technical training for the development of ball handling drills leads to an improvement in the student's skill sets overall performance and an increase in dribble speed, according to [11]. The results clearly showed that regular participation in basketball technical training could improve basic basketball skills of the students.

The supporting study by [10], looked into how basketball technical training affected dribbling performance and found that dribbling speed improved significantly. Additionally, [18] looked into how technical basketball training affected the execution of a few fundamental basketball skills and enhanced the students' performance.

4.2. On Stationery Two-point Shooting

In the case of stationery two-point shot, the findings of the

study showed that significant improvement was observed in the experimental group from pre-test to post-test after eight-weeks of technical training, but no significant improvement was observed in the control group from pre-test to post-test. Therefore, this study showed that there was a significant difference in shooting skill from different stationary spots and from different angles in the experimental group participants compared with the control group participants. Because a significant difference was observed, the alternative hypothesis was accepted.

The most significant findings from the earlier study by [16], which employed an experimental methodology, show that basketball shooting accuracy training improves shooting skills, while adapting technical training to the direction of shooting skills improves students shooting skills. The most significant findings from [16], s experimental study, which led to the most important findings, demonstrate that technical accuracy training improves shooting skills while adapting technical training to the direction of shooting skills improves shooting rate.

The jump shot is the most frequently used shot in basketball competition, accounting for 67% of all shots attempted in the 2014–15 National Basketball Association (NBA) regular season [7]. Basketball's most popular shot type is the jump shot, according to statistics culled from two of the biggest leagues in the world: the NBA and Euro League. Each NBA game featured 154 total shots attempted, according to earlier research [7]. Over 104 jump shots are routinely attempted during game play because the jump shot makes up 67% of all shots attempted [7]. The accuracy of jump shots, which is equally important, is a factor in game outcome in addition to the frequency with which each side attempts them.

5. Conclusion

In light of the results of the study, the limits of the sample, and the frame work of statistical treatments used, basketball technical training like fundamentals of ball handling training (vital for dribble and shot), dribbling drills (that improve speed dribbling skill) and shooting drills (that improve stationery two-point shot skill) had a significant effect on the improvement of students speed dribbling skill and chest pass skills.

Regular participation in basketball technical training had a significant effect on the improvement and enhancement of speed dribbling skill and stationery two-point shot skill. The performance and skills of speed dribbling and stationery two-point shot skill were improved due to well-planned and well-designed basketball technical training among students. This study also concluded that the technical training intervention program carried out during eight-weeks intervention period is conducive, effective, and has a positive influence on improving dribbling (speed dribble) and shooting (stationery two-point shot) skills.

In general, the researcher concluded that providing systematic and gradual increment of both duration and intensity of basketball technical training after eight-week intervention,

statistically significant improvements and changes were observed in the students' speed dribbling and stationery two-point shot skills.

Abbreviations

NBA	National Basketball Association
CMJ	Counter Movement Jump
CVD	Cardio Vascular Disease
SPSS	Statistical Package for the Social Sciences
SD	Standard Deviation
EG	Experimental Group
CG	Control Group

Author Contributions

Assaye Gashaw: Conceptualization, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Writing – original draft

Ajanaw Addis: Supervision, Visualization, Writing – review & editing

Lamesigin Firew: Supervision, Visualization, Writing – review & editing

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this article. I hereby declare that I have no conflicts of interest related to this work. I have not received any financial support or sponsorship from any organizations that could influence the research or its outcomes. Thank you for considering this statement. I am committed to maintaining the integrity of my research.

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