

Improving Female Basketball Shooting Accuracy Using Corrective and Stability Exercises

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ABSTRACT: *Developing effective training methods to enhance shooting accuracy in women's basketball provides key insights into precision fundamentals, thus elevating the gameplay quality and competitiveness. This study evaluated the effectiveness of targeted corrective and stability exercises in enhancing shooting accuracy among female basketball players. The quasi-experimental study involved 70 female students, from a public middle school in Villanueva North District, Misamis Oriental, Philippines. They were divided into two groups: Corrective Exercises and Stability Exercises groups. The participants' pretest and posttest scores were analyzed using descriptive statistics and T-tests. The results indicated that before the intervention, participants in both groups demonstrated poor shooting accuracy with slight improvement following the intervention. The comparable levels of improvement between the two groups suggest that each type of exercise is equally effective in improving basketball shooting accuracy. Results suggest that an exercise program grounded in the Principle of Motor Learning, which breaks down complex actions for more effective practice, can enhance basketball shooting accuracy despite physical asymmetries and balance issues. The study recommends that educators and coaches implement structured physical activities to boost students' shooting accuracy. It also urges future research to explore comprehensive training programs and demographics of shooting accuracy using corrective and stability exercises.*

KEYWORDS: female shooting accuracy, corrective exercises, stability exercises

INTRODUCTION

Basketball precision affects scoring and winning. In basketball, two teams fight to see who can get the ball through a hoop first. Asymmetries, physical flaws, and a lack of balance can make it hard for women to shoot well. The need for a full plan to help women get better at basketball with poor shooting accuracy may help boost the confidence and win the game (Nordahl et al., 2020). Women's basketball shooting skills and success may be helped by training and routines that are based on research (Gür et al., 2022). Methods have come along the way, but female athletes often do not have access to programs that are made for the special physical and physiological needs (Alexander, 2016). This study hopes to close this gap and give female basketball players training methods that are backed by evidence. Consequently, it helped the students to improve the shooting efficiency and be more competitive on the court.

Furthermore, it should be noted that in the context of Turkey, scholars have mostly focused on researching the influence of engaging in free throw shots at different distances on shooting

precision. Moreover, considering factors, like shooting technique, balance, and mental concentration may improve the team's score (Cetin et al., 2019). Additionally, there is a need to learn corrective exercises. These workouts enhance shooting techniques and accuracy, which are crucial parts of basketball. Even a minor alteration in a player's corrective exercises may significantly impact the performance (Eastman, 2015). In this connection, this research aims to explore the effectiveness of corrective and stability exercises in increasing shooting consistency and performance, as well as identify the exercises and approaches that work best for these varied training methods.

Corrective exercises focus on fixing shooting technique weaknesses, while stability exercises focus on enhancing balance and control. By investigating the effectiveness of these interventions, the study can provide valuable insights for coaches, players, and trainers on how to design effective training programs that can lead to better female basketball shooting accuracy. The study may involve evaluating different exercises and approaches for corrective and stability exercises and comparing the impact on shooting consistency and performance. By understanding which exercises and approaches work best, coaches and trainers can create training programs that address specific shooting weaknesses and improve accuracy.

Conceptual Framework

This study assumes that corrective and stability exercises can enhance the shooting accuracy of Grade 8 students. Corrective exercises can improve the body's efficiency, improve basketball skills, and reduce the risk of getting hurt, which helps them do better and last longer on the court. Stability exercise is the ability to stand or move while staying in control of the body position and keeping balance. The Principle of Motor Learning by (Montella et al., 2019) states that corrective exercises might make people more accurate with shooting skills as they break down complicated actions into smaller, easier-to-control parts that can be practiced repeatedly.

On the other hand, the Principle of Movement Efficiency by (Fountain et al., 2022) corroborates the use of these measures. Additionally, it helps the brain and muscles make links so that novices can do the pattern more easily and with more accuracy. Women may further hone the skills and perform at the highest possible level by adhering to the concept of motor learning, which emphasizes the significance of purposeful practice and repetition in skill development. Motor learning is a key part of sports success because it shows how important practice, feedback, and careful repetition are for building and improving basic skills. Examining the effects of corrective workouts on the shooting accuracy of novice basketball players (Koz et al., 2019). Allowing female players to perform better with less effort and reach full physical ability. This improves the corrective exercises that include form shooting, shooting with a partner, and shooting off the dribble. With good posture improves basketball shooting, and specialized exercises may help female basketball players improve shooting accuracy (Danciu et al., 2019). Dynamic stretching, band resistance, and balance training improved basketball players' shooting accuracy (Brown et al., 2015). Thus, using efficient movement patterns, break down movements and practice each component equally. To enhance the overall level of movement, save energy, and promote correct posture, all of which resulted in an increase in athletic performance with less risk of injury.

Figure 1 presents the schema of the variables used in the study. The independent variables are the corrective exercises, which include form shooting, shooting with a partner, and shooting off the dribble, while stability exercises include single-leg balance, step-ups, and improving ankle mobility. With a pre-test and a post-test, the dependent variable shows how skills change over time. A pretest is a skills test that helps figure out what corrective and stability exercises are needed for shooting skills. The relationship between shooting accuracy and dependent variables, like corrective and stability exercises, correlates better.

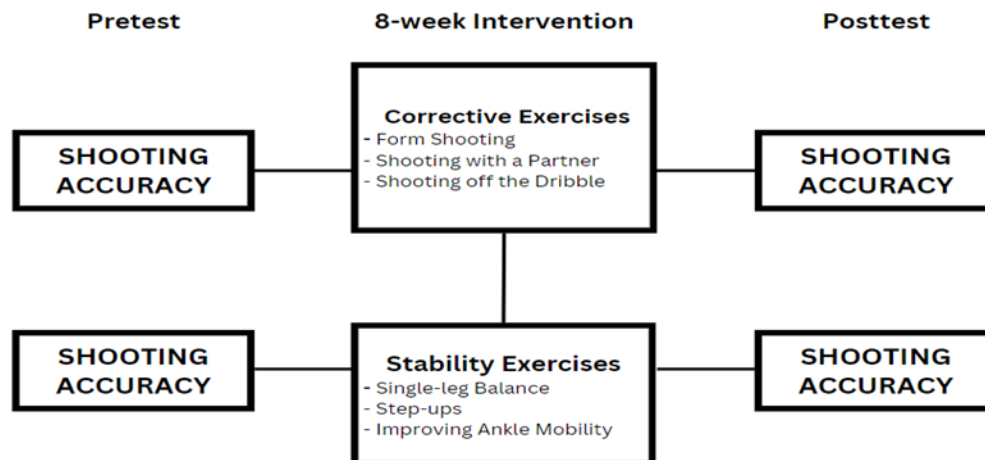


Figure 1. Schematic Presentation of the Study

METHODS

In this study, the researcher employed a quasi-experimental design and allocated students to one of two different intervention groups established specifically for this study (Qudus et al., 2022). Aims to fix two problems that make it hard for us to describe causal connections with spatial data (Runfola et al., 2020). A control group that does not get the training program may help control bias in this design. The posttest is a measurement of the same ability after the participant has participated in corrective and stability exercises. The following normative data values adapted from the Basketball Free Throw Shot by Johnson Basketball Test (Kumar et al., 2022) that is anchored with the (FIBA & Official, 2020) to evaluate the points. Seventy (70) is the total number of Grade 8 students, and 0.05 is the level of significance or the number of random errors that may be accepted.

DISCUSSION OF RESULTS

Table 1 shows the frequency, percentage, and mean distribution of the participants' shooting accuracy performance before and after the interventions.

Table 1. Frequency, Percentage, and Mean Distribution of the Participants' Shooting Accuracy

Range	Interpretation	GROUP A Corrective Exercises				GROUP B Stability Exercises			
		Pretest		Posttest		Pretest		Posttest	
		F	%	F	%	F	%	F	%
46 – 60	Outstanding	0	0.00	0	0.00	0	0.00	0	0.00
31 – 45.99	Very Good	0	0.0	1	2.9	0	0.0	0	0.0
21 – 30.99	Good	2	5.7	2	5.7	0	0.0	1	2.9
11 – 20.99	Fair	6	17.1	8	22.9	6	17.1	7	20.0
0 – 10.99	Poor	27	77.1	24	68.6	29	82.9	27	77.1
Total		35	100.0	35	100.0	35	100.0	35	100.0
Mean		7.68		10.20		7.17		8.51	
Interpretation		Poor		Poor		Poor		Poor	
Standard Deviation		6.20		6.82		3.92		4.06	

Table 1 shows the frequency, percentage, and mean distribution of the participants' shooting accuracy performance before and after the interventions. Findings reveal that before the intervention, the corrective exercises group had a generally poor rating in their shooting accuracy

as indicated by the mean of 7.68 points. After being exposed to the intervention, their shooting accuracy increased into fair category as indicated by the mean of 10.20 points.

Before the intervention, the Corrective Exercises group had a low shooting accuracy, scoring 7.68 points on average, which was considered as "poor." Surprisingly, after the intervention, their shooting accuracy did not get better; instead, it increased to 10.20 points, still categorized as "poor." This suggests that the corrective exercises may not have the desired positive effect on the group's shooting accuracy, and their accuracy remained in the low range. Furthermore, among the 35 participants, 27 (77.1%) initially demonstrated a "poor" rating in shooting accuracy before the intervention of Corrective Exercise. Following the intervention, the number of participants in this group decreased to 24, implying a positive shift. Additionally, the remaining participants exhibited improved shooting accuracy, with ratings ranging from "fair" to "very good," suggesting an overall enhancement in the group's performance.

For the Stability Exercise group, the pretest results revealed a predominantly "poor" shooting accuracy, with 29 participants (82.9%) falling into this category. Despite the implementation of Stability Exercises, the shooting accuracy for most participants in this group remained in the "poor" category, although there was an improvement with 7 participants now classified as "fair" and 1 participant in the "good" category. Additionally, of the 35 participants, 27 (77.1%) had a poor rating in the shooting accuracy before the corrective exercise. After the intervention, only 24 remained in this category. The rest participants already had fair to very good shooting accuracy.

This is supported by a study in India, which became a member of FIBA Asia, and emphasized the importance of shooting accuracy in basketball (Kumar et al., 2022). Thus, the result adheres to widely established basketball criteria using worldwide (FIBA & Official, 2020). Thus, the result adheres to widely established basketball criteria using the worldwide FIBA scoring mechanism. The decrease in the number of participants with "poor" shooting accuracy ratings following the intervention indicates a positive shift; however, the overall lack of significant improvement in shooting accuracy points to the need for a more targeted and individualized approach in designing corrective exercises to improve shooting accuracy.

Table 2 presents the paired sample T-test analysis of the two groups' shooting accuracy difference before and after the interventions. Findings reveal that both groups have significant differences in their shooting accuracy, with the posttest result showing significantly higher shooting accuracy than the pretest result.

Table 2. Result of the Test of Difference in the Female Participants' Shooting Accuracy in Basketball Before and After the Interventions.

The standardized effect (-5.53) measures the difference between the mean of Corrective and Stability Exercises. The results demonstrate that there is a substantial difference in shooting accuracy between Groups A and B before and after treatments. Corrective Exercises improved significantly in Group A, as revealed by a t-value of -4.10 (p 0.01) and a medium effect size of -0.69. Stability Exercises also resulted in a significant improvement in Group B, with a t-value of -3.13 (p = 0.004) and a medium effect size of -0.53.

	GROUP A Corrective Exercises					GROUP B Stability Exercises				
	Pretest	Posttest	t	p	d	Pretest	Posttest	t	p	d
Shooting Accuracy	7.68	10.20	-4.10**	.001	-0.69	7.17	8.51	-3.13**	.004	-0.53

**significant at 0.01 level

Based on the results, the null hypothesis is rejected. The data indicate that both Corrective and Stability Exercises have a substantial impact on increasing shooting accuracy in female basketball players. The negative t-values suggest that shooting accuracy improved following the interventions, and the modest p-values support the rejection of the null hypothesis. Furthermore, the impact sizes reveal the practical significance of the gains found in each group. The result in Group A, corrective exercises is supported by the theories of the Principle of Motor Learning by (Montella et al., 2019). This emphasizes that good shooting improvement interventions like form shooting, shooting with a partner, and shooting off dribble improve the mechanics and coordination of the shooting action. The combination of these exercises gives a holistic strategy for improving precise and efficient basketball shooting skills.

Furthermore, the results are in line with what Cetin et al. (2019) found confidence, concentration, and physical condition (footwork, balance, and shooting technique) increase shooting accuracy. Furthermore, the corrective exercises consist of form shooting, shooting with a partner, and shooting off the dribble (Klusemann et al., 2018). It means corrective exercises assist with balance strength and flexibility, resulting in a more solid shooting platform. On the other hand, Group B, the stability exercise group applied the Principle of Movement Efficiency (Fountain et al., 2022). Stability exercises include single-leg balance, step-ups, and improving ankle mobility based on the participants shooting accuracy. This implies that reducing postural sway, which is too much movement while shooting, may help improve shooting accuracy.

Stability exercises improve the ability of an individual to maintain the balance to move while staying in control of the body's position (Danciu et al., 2019). Lower body strength and dynamic stability can give a more stable platform for shooting, allowing players to produce force from their legs while remaining balanced during the shooting motion (Brown et al., 2015). Thus, strength, stability, and mobility contribute to more controlled and consistent shooting performances on the court. After 8-week observations, the researcher viewed that constant implementation, and monitoring with participants all contributed to the interventions' efficacy in improving shooting accuracy. The Corrective and Stability Exercises were carried out by the participants seriously. This may contribute to the success of the treatments carried out by both groups. This multidimensional approach ensures that participants receive continuous support throughout the intervention program, increasing motivation and the overall impact of the training on shooting accuracy performance. Thus, the findings indicate that both Corrective Exercises (Group A) and Stability Exercises (Group B) improved shooting accuracy. Group A improved more than Group B, demonstrating that the Corrective Exercises had a greater impact on shooting accuracy than the stability exercises.

Table 3 presents the independent sample T-test analysis of the difference between the shooting accuracy increment of the Corrective Exercise Group and the Stability Exercise Group.

Table 3 presents the analysis of the difference between the shooting accuracy increment of the corrective exercise group and the stability exercises group. Findings reveal that. There is no

significant difference between the two groups regarding shooting accuracy in basketball. Therefore, based on the data, there is no evidence that Corrective and Stability Exercises significantly differ in their score increments. Hence, this study found that while both exercises are comparably effective at enhancing shooting accuracy, one intervention is akin to another.

Table 3: Result of the Test of Difference in the Two Groups of Female Participants' Shooting Accuracy Increments

Shooting Accuracy	Corrective Exercise GROUP A	Stability Exercise GROUP B	t	p	Effect size
Mean Increment	2.51	1.34	1.567	0.122	0.375
SD	3.63	2.53			

significant at .01 level

Furthermore, there is not enough evidence to suggest that one type of exercise (corrective or stability) is more effective than the other in enhancing shooting accuracy. The observed differences in mean increments are not statistically significant. Accordingly, the effect size of 0.37 suggests a small-to-medium practical significance, but this alone is not enough to establish statistical significance. The results implied that within the scope of this study, Corrective and Stability Exercises have a comparable impact on shooting accuracy increments. The Corrective Exercises group's combination of form shooting, shooting with a partner, and shooting off the dribble gave a diverse approach to improving shooting accuracy. These exercises focus on fundamental shooting mechanics, which boosts team value, scoring, and performance and reduces the possibility of missing shots contributing to the overall success of the corrective exercise intervention. Thus, corrective exercise routines impact on the shooting precision of inexperienced female basketball participants (Koz et al., 2019).

Meanwhile, stability exercises involved were single-leg balance, step-ups, and improving ankle mobility that efficiently targets lower leg muscles and leads to improved shooting accuracy in female basketball players. These interventions promote proprioception, lower body strength, stability, and ankle mobility, which corresponds to the special needs of basketball shooting. This confirms what (Brown et al., 2015) found that by focusing on these areas in a planned way, the drills helped participants move more efficiently, improving their shooting accuracy. Lastly, there is no statistically significant difference in the mean increments of shot accuracy between the corrective exercise group and the stability exercise group based on the information presented and a significance threshold of 0.01. The effect size, on the other hand, shows a practical significance, implying that the observed difference, while not statistically significant, may still be of practical value.

CONCLUSION AND RECOMMENDATION

Basketball shooting is a competitive sport requiring accurate shooting skills that the use of an exercise program as a therapeutic intervention may improve. The research was based on the Principle of Motor Learning, which aims to break down complicated actions into smaller, easier-to-control parts that can be practiced over time. These factors included asymmetries, physical flaws, and a lack of balance that can make it hard for females to shoot well, all of which were caused during the participants' preparation for school intramurals that would last three days. As a result, there is a need for basketball shooting accuracy to prevent unfavorable incidents induced by an imbalance in corrective and stability exercises between the upper and lower muscles.

Therefore, the study concludes that corrective and stability exercises effectively enhance leg endurance.

Recommendations were framed considering the findings and conclusion of the study. These practical, real-life applications and proposals are addressed to the benefactors of the survey:

For the *physical education teachers* to design and make effective methods of teaching, especially when it comes to giving students chances to get healthier and more fit. For the *junior high school learners* to actively participate in physical activities, especially exercise that focuses on corrective and stability activity, provided that they securely do the exercises and adhere to the required stages of the program, which include a warm-up, regular exercise, and cool-down. For the *coaches* to improve the athlete's basketball shooting accuracy via training and by following the exercise plan for corrective and stability exercises that is like the one employed in the research. For the *future researchers* to investigate several other novel remedies for improving shooting accuracy. Additionally, the researcher suggests redistributing the participants in the study across demographic categories such as age, gender, and degree of expertise. In addition, the researchers of the future may think about the possibility of creating a test that has high levels of validity and reliability.

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