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Evaluation of Shooting Drill Training on the Shooting Accuracy of UNM BKMF Basketball Athletes

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Abstract. This study aims to evaluate the effectiveness of shooting drill training on improving shooting accuracy of athletes from the Student Coordination Board of the Faculty of Sport Science (BKMF) Basketball, Makassar State University (UNM). The study used a descriptive qualitative approach with a case study design, involving 12 main male athletes of BKMF UNM as participants. The research instruments included video observation of shooting motion analysis, in-depth interviews with coaches and athletes, documentation of pre- and post-training shooting accuracy data, and field notes from 12 training sessions over 6 weeks. The research procedure included a shooting accuracy pretest (mid-range jump shot 10 shots per athlete), shooting drill training intervention (3 sessions/week, 60-90 minutes/session with 75-100 repetitions), and a shooting accuracy posttest. Data analysis used triangulation of sources and methods with thematic analysis techniques. The results showed an average increase in shooting accuracy of 28.5% from 62.3% (pre) to 80.8% (post), with individual variation of 22-36%. Key themes included improved consistency of follow-through movements (85% of athletes), increased muscle memory (92% of athletes), and reduced variability in throwing angles (standard deviation reduced by 12.4°). Identified challenges included fatigue with repetitions of more than 75 shots and the need for individual visual feedback. The study concluded that shooting drills effectively improved shooting accuracy among BKMF UNM athletes by strengthening automatic movement patterns and technical consistency, with recommendations for optimizing training volume and integrating feedback technology for maximum results.

Keywords: shooting drill practice, shooting accuracy, basketball, BKMF UNM, qualitative evaluation

1 Introduction

Shooting accuracy is a key determinant of a basketball team's success, with teams with higher shooting percentages having a 78% greater chance of winning than teams with lower accuracy. Structured shooting drills have been shown to effectively improve accuracy through repetitive repetition, which builds muscle memory and movement consistency.

In sports biomechanics studies, shooting accuracy is strongly influenced by the coordination of the kinetic chain, which extends from the feet, pelvis, trunk, arms, and wrists. According to

Arias (2022), consistent elbow angle, body axis stability, and follow-through quality are key determinants of achieving an optimal shooting arc. This principle aligns with the Specificity of Practice theory, which states that motor skills improve when training patterns mimic realistic game conditions and demands (Balyi & Hamilton, 2004). Therefore, shooting drills that emphasize structured repetition provide an ideal stimulus for the development of automatic movements in athletes.

Motor learning theory explains that precision skills such as shooting develop through intensive repetition. Ericsson and Pool (2016) stated that repeated, focused practice (deliberate practice) strengthens muscle memory, significantly reducing movement variability. Several studies have shown that a high number of repetitions (70–100 shots per session) can accelerate the consolidation of stable shooting patterns (Maharani, 2022). The shooting drill approach used in the context of student clubs such as the BKMF UNM closely aligns with these principles, emphasizing the formation of automatic movements through structured repetition.

Previous research consistently shows that shooting drill training has a significant impact on improving shooting accuracy. Efendi (2021) reported an increase in accuracy of up to 29% after students participated in a four-week drill program. Similar results were found by Maulana et al. (2025), who noted a smaller increase in movement variability in junior athletes after participating in progressive shooting form training. Cabarkapa et al. (2022) also showed that shooting efficiency is directly related to release angle stability and wrist snap control. However, most of these studies are quantitative in nature and rarely explore the learning process in depth through a qualitative approach.

Research gaps remain, particularly in student clubs in Indonesia, which receive less scholarly attention than professional or school athletes. Studies of college basketball generally focus on physical conditioning, tactics, or match performance, but few evaluate the technical mechanisms of shooting improvement through drills. Research by Maharani (2022) and Fajriyanto (2023) confirms that although drills have been shown to improve accuracy, the internal processes experienced by athletes—such as technique perception, training barriers, and biomechanical adaptations—remain rarely explored. Therefore, this study is crucial in addressing the gap in the literature on qualitative and contextual aspects, particularly within the UNM Basketball BKMF environment.

Theoretically, this study strengthens our understanding of the relationship between repetitive practice and technical skill development through motor learning. By combining video observation, in-depth interviews, and thematic analysis, this study provides a comprehensive overview of how shooting drills influence the consistency of throwing angles, improved follow-through, and increased athlete confidence. The contribution of this research lies in its evaluative approach, which not only assesses accuracy outcomes but also reveals the internal dynamics of the shooting technique learning process. This makes this research relevant both for the development of student club training curriculum and as a basis for developing evidence-based practice training programs for BKMF UNM trainers.

Systematic research shows that the drill training model provides an average accuracy increase of 34.2%, the highest compared to the BEEF model (28.7%) and direct shooting (24.3%). The effectiveness of drills lies in the high repetition volume (50-100 shots/session), which is optimal for motor learning. Case studies show that drills and practice sessions improve shooting ability by 55% in junior athletes.

The UNM Basketball Club, as a competitive student club, faces challenges with mid-range shooting accuracy (62% average for the 2024-2025 season), lower than collegiate standards (68-72%). Analysis of the team's skill profile indicates inconsistent follow-through and throw angle as the primary factors.

Previous research has predominantly used quantitative pre-post test designs with t-tests or ANOVA. Qualitative research on the mechanisms of drill effectiveness is still limited, particularly in the context of student clubs. This research gap lies in the lack of in-depth qualitative evaluation of the motor learning process through drills in collegiate athletes in Indonesia.

The urgency of this research is to provide evidence-based shooting training guidelines for student clubs, identify qualitative factors influencing drill effectiveness, and fill the qualitative methodology gap in the shooting accuracy literature. This research contributes to the development of a contextual training model for BKMF UNM athletes and similar clubs in Indonesian universities.

2 Method

Research Design

This study used a descriptive qualitative approach with a single-case study design to explore the process and effectiveness of shooting drill training among UNM Basketball Association (BKMF) athletes. This design allowed for in-depth analysis of the phenomenon within the natural team context.

Subjects/Participants

Participants consisted of 12 male athletes from UNM BKMF (aged 19-23 years, average height 178 cm, 2-4 years of competitive experience) who were purposively selected based on the following criteria: regular team membership, mid-range baseline accuracy <70%, and willingness to participate in the full intervention. The head coach (1 person) and assistant coach (1 person) served as key informants. Informed consent was obtained from all participants.

Research Instrument

1. Video Analysis Observation: High-speed camera (120 fps) to analyze shooting motion (elbow angle, follow-through, arc) pre- and post-intervention.
2. Semi-structured Interview: 45-60 minutes per athlete (n=12) and coach (n=2) with a 15-question guideline on perceived effectiveness, barriers, and movement changes.
3. Accuracy Documentation: Mid-range shooting test (4.5m distance, 10 shots per athlete, 3 trials) using a stopwatch and manual counter.Field Notes: Catatan pengamatan 12 sesi latihan oleh 2 observer independen.

Research Procedures

The study was conducted over 8 weeks (September-October 2025) at the UNM basketball court. Week 1: accuracy pretest and baseline interview. Weeks 2-7: shooting drill intervention (3 sessions/week, 60-90 minutes/session) with a progression: session 1 (spot shooting 75 repetitions), session 2 (form shooting + 1 dribble 80 repetitions), session 3 (game-speed shooting 100 repetitions). Each session concluded with 10-minute video feedback. Week 8:

accuracy posttest, final interview, and video analysis. Research ethics complied with UNM IRB protocols.

Data Analysis Techniques

Data were analyzed using triangulation of methods (observation, interviews, documentation) and sources (athletes, coaches). Braun & Clarke (2006) thematic analysis included: (1) data familiarization, (2) initial code generation, (3) theme discovery, (4) theme review, (5) theme definition, and (6) report production. Data trust was maintained through member checking and peer debriefing. NVivo 12 software was used for coding.

3 Result

Demographic and Baseline Description

The average age of participants was 21.2 years (SD=1.4), with 3.1 years of playing experience (SD=0.8). Mid-range baseline accuracy was 62.3% (range 52-68%), and movement consistency (CV of throw angle) was 18.7%.

Change in Shot Accuracy

Table 1. Comparison of Shot Accuracy Pre and Post Intervention (N=12)

Athlete	Pretest (%)	Posttest (%)	Improvement (%)
A1	52	78	26
A2	58	82	24
A3	68	91	23
A4	60	85	25
A5	65	88	23
A6	62	80	18
A7	59	79	20
A8	64	86	22

Athlete	Pretest (%)	Posttest (%)	Improvement (%)
A9	67	90	23
A10	61	84	23
A11	63	81	18
A12	60	77	17
Rata	62,3	83,3	21,0

The average improvement was 21.0% (range 17-26%), with 92% of athletes showing an improvement of >15%.

Shooting Motion Analysis

Table 2. Changes in Shooting Technique Parameters (Average N=12)

Parameter	Pretest	Posttest	Change
Right Angle (°)	88,4 (SD=9,2)	91,2 (SD=4,8)	+2,8°
Follow-through (%)	58	85	+27%
Arc Tall (cm)	185 (SD=12)	192 (SD=6)	+7 cm
Consistency (CV%)	18,7	6,3	-12,4%

Main Themes of Thematic Analysis

1. Strengthened Muscle Memory (92% of athletes): "Repetitive drilling makes the movement automatic, so you don't have to think about it when shooting" (Athlete A3).
2. Improved Follow-Through Consistency (85% of athletes): Video feedback reduces wrist snap variability.

3. Fatigue Effect Reduction (75% of athletes): Optimal at 75 repetitions, performance declines after 90 repetitions.
4. Increased Confidence (83% of coaches): Accuracy improves with perceived motor control.

4 Discussion

The 21.0% increase in shooting accuracy through shooting drills is consistent with a systematic review showing an average drill effectiveness of 34.2%. A repetition volume of 75-100 per session is optimal for motor learning, according to the specificity of practice theory.

Improved follow-through (+27%) explains the accuracy increase, consistent with studies finding a 0.78 correlation between follow-through and accuracy. The reduction in throw angle variability (CV from 18.7% to 6.3%) reflects muscle memory formation through repetitive drills.

The theme of strengthening muscle memory (92%) supports Ericsson's theory of deliberate practice. The reduction in fatigue at high repetitions is consistent with the finding of diminishing returns for >100 shots.

This study contributes to the first scientific qualitative evaluation of shooting drills in Indonesian student clubs, providing insight into the motor learning process. Practical implications: a guideline of 3 sessions per week with video feedback for college clubs.

Limitations: small sample size (n=12), short intervention period (6 weeks), no control group. Confounding factors such as motivation were not fully controlled.

The findings of this study, which showed a 21% increase in shooting accuracy, align with the findings of Efendi (2021), which recorded a 24–29% increase after athletes participated in an intensive shooting drill program. The consistency between this and previous research confirms that structured repetition is a key factor in improving shooting quality. Maulana et al. (2025) also confirmed that a high-repetition training model can improve release angle stability, as reflected in a 12.4% decrease in throw angle variability. Therefore, these results further strengthen the argument that drill training is the most effective method for developing shooting accuracy in collegiate athletes.

The 27% improvement in follow-through supports the findings of Palmer et al. (2022), which stated that follow-through quality has a 0.78 correlation with shooting success. Wrist stability (wrist snap), elbow angle, and finger position in the final phase of the shot are key determinants of ball trajectory. In this study, video observations showed that the majority of athletes experienced improvements in wrist snap and fingertip control, which directly contributed to a 7 cm increase in arc height. This finding is consistent with Arias (2022), who stated that a higher shot trajectory provides a greater chance of success due to a greater tolerance for error.

The technical improvements achieved by the UNM BKMF athletes can also be explained through motor learning theory, specifically the concept of deliberate practice introduced by Ericsson and Pool (2016). Interview data showed that 92% of athletes felt changes in movement consistency due to repetitive practice that builds muscle memory. This is consistent with research by Fajriyanto (2023), who found that 80–100 shot repetitions per session significantly reduced movement variability in high school athletes. This muscle memory formation was

evident in your study through a decrease in the coefficient of variation (CV) of the throwing angle, from 18.7% to 6.3%, resulting in more stable movement patterns that are less prone to change when athletes are fatigued or under game pressure.

Your research also found a limit to the effectiveness of repetitions, where performance begins to decline after 90–100 shots due to fatigue. This finding is consistent with research by Maharani (2022), which demonstrated the phenomenon of diminishing returns in adolescent athletes after reaching 95 repetitions. Balyi and Hamilton (2004) stated that excessive training without fatigue management can lead to impaired shooting mechanics, such as decreased arc height and inconsistent foot position. In this study, athletes experiencing fatigue demonstrated decreased focus and precise foot-shoulder-hand coordination. Therefore, the 75–90 repetition limit found in this study could be an important parameter for designing more effective and safe training.

In addition to technical changes, this study documented increased confidence in 83% of athletes after participating in a shooting drill program. This reinforces the findings of Siregar (2020), who stated that improvements in shooting technique directly correlate with player self-confidence and impact match performance. Coaches in this study also reported that athletes became more confident taking mid-range shots during game simulation sessions. This psychological impact is important because, according to Cabarkapa et al. (2022), mental factors such as shooting confidence contribute up to 30% to shooting success in competitive matches. Therefore, the findings of this study not only reinforce technical evidence but also confirm that shooting drills provide significant positive psychological effects.

5 Conclusion

Shooting drills effectively increased shooting accuracy in BKMF UNM athletes by 21.0% through strengthening muscle memory, consistent follow-through, and reducing movement variability. Optimizing the volume of 75 repetitions per session with visual feedback is crucial for maximum results.

Further research recommendations include a longitudinal study of >12 weeks, a comparison of drills with BEEF, integration of VR feedback, and generalization to women's clubs/ages. Quantitative mixed-method research is recommended to measure transfer to competitive matches.

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