ISSN: 2798-7345 (online)
ISSN: 2830-2648 (print)

**Vol (7) No (1)**
doi: 10.31942/jess.v7i1.15692

**JOURNAL OF EDUCATION AND SPORT SCIENCE (JESS)**
http://publikasiilmiah.unwahas.ac.id/index.php/JESS

# The Effect of Specific Training Exercises Using Training Aids on the Development of Fast-Break Performance among Under-18 Three-on-Three Basketball Players

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**Abstract**

**Objectives:** This study aimed to examine the effect of specific strength training exercises using training aids on the development of three-player fast-break performance among under-18 basketball players.

**Materials and Methods:** This study used an experimental method with a pre-test and post-test control group design. The research population consisted of basketball players from seven clubs in Dhi Qar Governorate, Iraq, during the 2025–2026 season. The sample was selected purposively from Al-Nasiriya Club players under 18 years old. A total of 30 players participated, with 10 players used for the pilot study and 20 players assigned to the main research sample, divided into experimental and control groups. The experimental group received specific strength training exercises using training aids, while the control group followed the regular training program. Data were collected through pre- and post-tests of three-player fast-break performance and analyzed using appropriate statistical procedures.

**Results:** The results showed that the experimental group achieved greater improvement in three-player fast-break performance after applying the proposed strength training exercises with training aids. The training program helped improve movement coordination, transition speed from defense to offense, attacking organization, and scoring effectiveness during fast-break situations.

**Conclusions:** Specific strength training exercises using training aids had a positive effect on developing three-player fast-break performance among under-18 basketball players. These exercises may be recommended for youth basketball coaches to improve fast-break execution, reduce random attacking movements, and enhance offensive effectiveness during competition.

**Keywords:** Strength Training, Training Aids, Fast Break, Three-Player Attack, Basketball, Under-18 Players.

## Introduction

Basketball is a dynamic invasion sport that requires players to perform repeated high-intensity actions, including sprinting, jumping, cutting, passing, shooting, and rapid transition from defense to offense(Lestari & Dewi, 2022; McCormack, 2020). In modern basketball, offensive success is not only determined by individual technical ability but also by the team's capacity to organize quick and effective attacking patterns during game situations(Hidayat et al., 2024; Irawati & Aziz, 2025). One of the most important offensive strategies is the fast break, which allows a team to exploit defensive imbalance immediately after gaining ball possession through a steal, rebound, or defensive recovery.

Fast-break performance requires speed, explosive strength, coordination, decision-making, accurate passing, and efficient movement without the ball. In youth basketball, especially among under-18 players, the development of fast-break ability is highly important because this age group is in a critical stage of physical, technical, and tactical development. Previous research has shown that systematic basketball training can improve adolescents' strength, speed, endurance, and coordination, which are essential components for successful offensive transition performance(McCormack, 2020; Vealey, 2024) .

Strength training is considered an important component of basketball conditioning because it supports acceleration, jumping ability, body control, stability, and repeated high-intensity movement(David J. Smith, 2003; Dingley et al., 2015; Stien et al., 2019). Recent studies have reported that resistance and complex training methods can enhance physical performance variables in basketball players, including sprint ability, explosive power, agility, and movement stability . These physical qualities are closely related to fast-break situations, where players must move quickly from defense to offense, create numerical advantage, and complete attacks with effective scoring actions.

The use of training aids may further improve the quality of training by creating more specific, structured, and game-like practice conditions. Training aids can help athletes perform push-pull movements, resistance-based drills, directional movement tasks, and coordinated attacking patterns. In three-player fast-break situations, players must coordinate lane running, ball movement, spacing, timing, and finishing actions. Therefore, training programs that combine specific strength exercises with training aids may provide a practical approach to improving fast-break execution among youth basketball players.

Based on the researcher's field experience and observation of youth league matches among Iraqi clubs, several under-18 players still show weaknesses in executing three-player fast breaks. Their attacking movements often appear random, poorly coordinated, and less effective in producing scoring opportunities. This condition may lead to lost attacks, inefficient transitions, and reduced offensive productivity. These problems indicate the need for a more systematic training model that develops both the physical and tactical components required in fast-break performance(David J. Smith, 2003; Yan et al., 2023).

Therefore, this study was conducted to examine the effect of specific strength training exercises using training aids on the development of three-player fast-break performance among under-18 basketball players (Riyanto & Kuswoyo, 2019). The findings are expected to provide practical guidance for youth basketball coaches in designing more effective training programs to improve offensive transition, movement coordination, and scoring effectiveness during competitive play.

## Materials and Methods

### Study Design

This study used an experimental research design with pre-test and post-test measurements for two groups: an experimental group and a control group. This design was selected because it was suitable for identifying the effect of specific strength training exercises using training aids on three-player fast-break performance.

### Participants

The research population consisted of basketball players from seven clubs in Dhi Qar Governorate, Iraq, during the 2025–2026 season. The research sample was selected purposively from Al-Nasiriya Sports Club under-18 basketball players. A total of 30 players participated in the study. Ten players were used for the pilot study, while 20 players were included in the

main experiment. The main sample was randomly divided into two equal groups: an experimental group and a control group, with 10 players in each group.

**Homogeneity and Equivalence**

Before the main experiment, the researcher verified the homogeneity of the sample using anthropometric characteristics, including height, body mass, chronological age, and training age. The coefficient of variation values were below 30%, indicating that the sample was homogeneous.

Equivalence between the experimental and control groups was also tested in the three-player fast-break skill. The results showed no statistically significant difference between the two groups in the pre-test, indicating that both groups were equivalent before the intervention.

**Instruments and Equipment**

The tools and equipment used in this study included stopwatches, whistles, basketballs, an indoor basketball court, a laptop, a video camera, a medical scale, a jumping platform, resistance bands, medicine balls, TRX equipment, weighted vests, a push-pull cart, and a floor ladder.

**Fast-Break Performance Test**

The main test used in this study was the three-player fast-break test from both sides of the court. The purpose of the test was to measure the speed and effectiveness of three-player fast-break execution. Performance time was recorded from the starting whistle until the completion of the final shot. If an error occurred during performance, the attempt was repeated according to the test rules.

**Pilot Study**

A pilot study was conducted before the main experiment on 10 players from the same club. The pilot study aimed to verify the suitability of the test, ensure the validity of equipment, determine the time required for testing, evaluate the supporting team's efficiency, and standardize the proposed training exercises according to the players' abilities.

**Validity, Reliability, and Objectivity**

Test validity was established through expert evaluation. Reliability was examined using the test-retest method with a seven-day interval. The reliability coefficient for the three-player fast-break test was 0.94, while the objectivity coefficient was 0.96. These values indicated that the test had high reliability and objectivity.

**Training Program**

The main training program lasted 10 weeks, from October 18 to December 24, 2025. The experimental group performed specific strength exercises using training aids, while the control group followed the regular training program prepared by the team coach.

The experimental program consisted of 40 training units, with four sessions per week on Saturday, Sunday, Tuesday, and Wednesday. The exercises included resistance-based and strength-oriented drills using training aids such as push-pull carts, elastic ropes, resistance bands, medicine balls, TRX, weighted vests, and jumping obstacles.

**Statistical Analysis**

Data were analyzed using SPSS. The statistical methods included percentage, arithmetic mean, standard deviation, coefficient of variation, Pearson correlation coefficient, paired sample t-test, and independent sample t-test. The level of statistical significance was set at $p \leq 0.05$.

## Results

Present the findings of the study clearly and systematically using tables, figures, percentages, mean scores, statistical values, or other relevant research outcomes.

**Table 1.** Assessment Results of Students' Dribbling Skill

| No. | Score Range | Category | Frequency | Percentage |
|---|---|---|---|---|
| **1** | Example range 1 | Category A | x | x% |
| **2** | Example range 2 | Category B | x | x% |
| **3** | Example range 3 | Category C | x | x% |
| **4** | Example range 4 | Category D | x | x% |
| **5** | Example range 5 | Category E | x | x% |
| Total | | | **N** | **100%** |

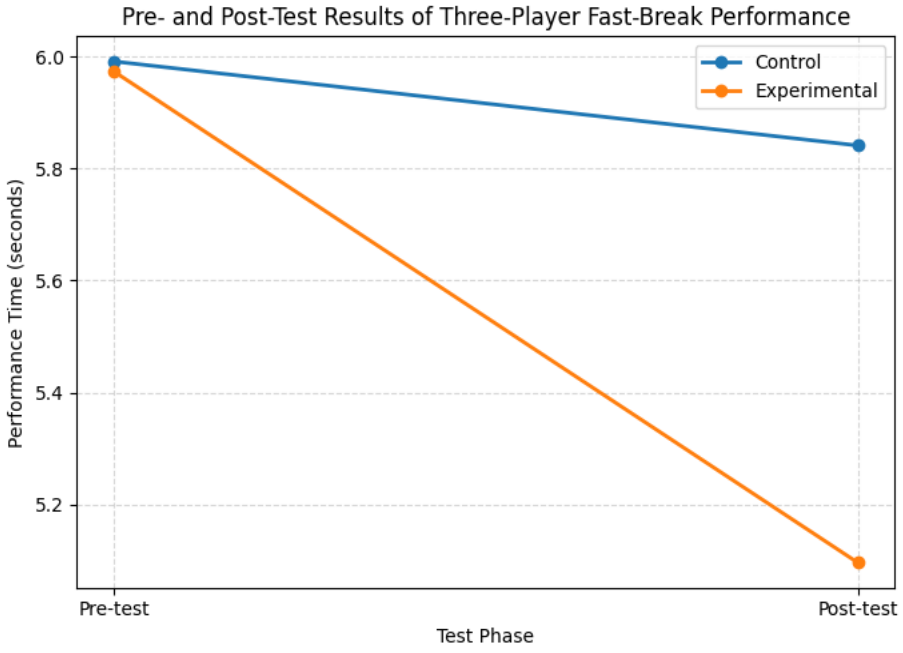


**Figure 1.** Pre- and post-test comparison of three-player fast-break performance

**Table 2.** Pre- and post-test results of three-player fast-break performance

| Group | Pre-test Mean ± SD | Post-test Mean ± SD | t-value | Sig. | Result |
|---|---|---|---|---|---|
| **Control** | 5.991 ± 0.38 | 5.841 ± 0.525 | 0.695 | 0.527 | Not significant |
| **Experimental** | 5.973 ± 0.272 | 5.097 ± 0.449 | 5.329 | 0.000 | Significant |

The results show that the control group experienced a slight decrease in performance time from 5.991 ± 0.380 seconds in the pre-test to 5.841 ± 0.525 seconds in the post-test. However, this difference was not statistically significant, as indicated by the calculated t-value of 0.695 and a significance value of 0.527.

In contrast, the experimental group showed a clear and statistically significant improvement in three-player fast-break performance. The mean performance time decreased from 5.973 ± 0.272 seconds in the pre-test to 5.097 ± 0.449 seconds in the post-test. The calculated t-value was 5.329 with a significance value of 0.000, indicating a significant difference in favor of the post-test.

Overall, these findings indicate that the specific strength training exercises using training aids were effective in improving three-player fast-break performance among under-18 basketball players.

## Discussion

The findings of this study showed that the experimental group achieved significant improvement in three-player fast-break performance after completing the strength training program using training aids. This improvement can be attributed to the specific nature of the exercises, which targeted the physical and technical requirements of fast-break performance.

Fast-break performance in basketball requires explosive strength, acceleration, body control, passing coordination, and rapid transition from defense to offense. The training aids used in this study, such as resistance bands, medicine balls, TRX, weighted vests, and push-pull carts, helped create specific resistance and movement patterns similar to basketball game situations. This type of training likely improved the players' ability to move quickly, coordinate with teammates, and complete attacks more efficiently.

These findings are consistent with (Bompa et al., 2009), who stated that strength training is an essential foundation for improving sport-specific performance. The development of muscular strength supports the execution of technical and tactical movements, especially in sports requiring speed, power, and repeated explosive actions.

The results also align with (David J. Smith, 2003), who emphasized the importance of modern training methods in basketball for improving technical and tactical performance. Similarly, (Cruickshank & Collins, 2012) explained that strength and explosive power training contribute directly to the development of offensive movement efficiency in basketball.

The non-significant improvement observed in the control group may be explained by the limited specificity of the regular training program. Although traditional training may maintain general physical and technical performance, it may not provide sufficient stimulus to significantly improve fast-break execution. In contrast, the experimental program was designed to target the working muscles and movement patterns involved in fast-break performance.

The improvement in the experimental group also supports the view of (Kuswoyo et al., 2020), who indicated that effective training planning must consider the relationship between training load, exercise intensity, rest periods, and the individual characteristics of athletes. In the present study, the exercises were progressively organized and adapted to the players' abilities, which may have contributed to the positive results.

Overall, the findings suggest that strength training exercises using training aids are effective for improving three-player fast-break performance among under-18 basketball players. These exercises not only develop physical strength but also enhance offensive movement coordination, transition speed, and tactical execution.

## Conclusions

Specific strength training exercises using training aids had a significant positive effect on developing three-player fast-break performance among under-18 basketball players.The experimental group, which applied the proposed exercises using training aids, achieved better improvement than the control group that followed the regular training program.The use of training aids helped develop the physical abilities required in basketball, particularly strength, speed, explosive power, and movement coordination.The improvement in physical abilities positively influenced offensive performance, especially in fast-break situations.The study recommends that youth basketball coaches use specific strength exercises supported by training aids to improve offensive transition performance and reduce random attacking movements during competition.

## Acknowledgments

The author would like to express his sincere gratitude to Al-Nasiriya Sports Club for allowing the implementation of this study and for supporting the data collection process. The author also extends his appreciation to the coaches, assistant team, and under-18 basketball players who participated in the training program and testing procedures. Special thanks are also given to the experts and specialists who provided valuable guidance in validating the research procedures and instruments.

## References

Bompa, Tudor O, & Haff, Greg. (2009). *Periodization: Theory and methodology of training - National Library of Medicine Institution*. https://catalog.nlm.nih.gov/discovery/fulldisplay/alma9916082183406676/01NLM_INST:01NLM_INST

Cruickshank, A., & Collins, D. (2012). Culture Change in Elite Sport Performance Teams: Examining and Advancing Effectiveness in the New Era. *Journal of Applied Sport Psychology*, *24*(3), 338–355. https://doi.org/10.1080/10413200.2011.650819

David J. Smith. (2003). *A Framework for Understanding the Training Process Leading to Elite Performance | Sports Medicine*. https://link.springer.com/article/10.2165/00007256-200333150-00003

Dingley, A. A., Pyne, D. B., Youngson, J., & Burkett, B. (2015). Effectiveness of a Dry-Land Resistance Training Program on Strength, Power, and Swimming Performance in Paralympic Swimmers. *Journal of Strength and Conditioning Research*, *29*(3), 619–626. https://doi.org/10.1519/JSC.0000000000000684

Hidayat, F., Royana, I. F., & Pradipta, G. D. (2024). Development of Physical Education Learning Media for Basketball Material Based on Android-BASUKA. *Musamus Journal of Physical Education and Sport (MJPES)*, *6*(3), Article 3. https://doi.org/10.35724/mjpes.v6i3.6244

Irawati, A. F., & Aziz, M. I. M. (2025). The Role Of Upper And Lower Body Strength Balance On Three-Point And Free-Throw Accuracy In Collegiate Basketball Players. *Indonesian Journal of Physical Education and Sport Science*, *5*(2), 277–285. https://doi.org/10.52188/ijpess.v5i2.1243

Kuswoyo, D. D., Wasa, C., & Dongoran, M. F. (2020). Back-up training effects to the students' ability in heading the ball. *Edu Sportivo Indonesian Journal of Physical Education*, *1*(1), Article 1. https://doi.org/10.25299/es:ijope.2020.vol1(1).5190%0AHow

Lestari, A., & Dewi, R. C. (2022). *Hubungan Kepercayaan Diri Dan Motivasi Terhadap Peak Performance Pada Atlet Bola Basket Di Kabupaten Jombang. 10*(03).

McCormack, C. (2020). *A Principled Approach to Equipment Scaling to Enhance Skill Acquisition in Female Junior Basketball* [Application/pdf,application/pdf]. https://doi.org/10.25907/00009

Riyanto, P., & Kuswoyo, D. D. (2019). Pengaruh Model Pembelajaran Jigsaw Terhadap Peningkatan Kemampuan Drible Bola Basket. *Musamus Journal of Physical Education and Sport (MJPES)*, *2*(01), Article 01. https://doi.org/10.35724/mjpes.v2i01.2069

Stien, N., Saeterbakken, A. H., Hermans, E., Vereide, V. A., Olsen, E., & Andersen, V. (2019). Comparison of climbing-specific strength and endurance between lead and boulder climbers. *PLOS ONE*, *14*(9), e0222529. https://doi.org/10.1371/journal.pone.0222529

Vealey, R. S. (2024). A framework for mental training in sport: Enhancing mental skills, wellbeing, and performance. *Journal of Applied Sport Psychology*, *36*(2), 365–384. https://doi.org/10.1080/10413200.2023.2274459

Yan, J., Jones, B., Smith, J. J., Morgan, P., & Eather, N. (2023). A Systematic Review Investigating the Effects of Implementing Game-Based Approaches in School-Based Physical Education Among Primary School Children. *Journal of Teaching in Physical Education*, *42*(3), 573–586. https://doi.org/10.1123/jtpe.2021-0279