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THE EFFECT OF SPECIFIC EXERCISES ON DEVELOPING KEY MOTOR ABILITIES AND BASKETBALL SHOOTING SKILL PERFORMANCE IN FEMALE STUDENTS

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ABSTRACT

This research examines the impact of specific exercises on improving motor abilities and basketball shooting skills in female students. The study highlights basketball as a sport requiring high motor skills and physical abilities, particularly shooting, which is essential for winning. The research problem was identified as a lack of effective training methods and inadequate training curricula, resulting in weak development of fundamental motor skills, such as speed and precision, negatively impacting female students' performance. The experimental method was applied to a sample of 30 female students divided into a control and an experimental group. A tailored training program consisting of 24 sessions over three months was implemented, utilizing educational tools such as videos and CDs to enhance performance. Results showed significant improvements in motor abilities (e.g., speed and explosive strength) and basketball shooting skills in the experimental group compared to the control group. The study concludes that specific exercises effectively enhance students' motor and skill capabilities. It recommends incorporating such exercises into training curricula and suggests future studies to assess their impact on other sports.

KEYWORDS: *Specific Exercises, Motor Abilities, Shooting Skill and Basketball.*

INTRODUCTION

Basketball is one of the most popular sports worldwide, known for its excitement and significant role in promoting physical fitness and motor skills among players. The game requires a combination of physical and technical abilities to achieve optimal performance. Among these, shooting skill is pivotal for scoring points and winning matches.

In the educational context, developing basic motor abilities and technical skills in female students is vital for enhancing their sports performance and building confidence. Utilizing specific and targeted exercises can effectively develop fundamental motor abilities such as balance, speed, and accuracy, positively impacting shooting performance in basketball.1

This research aims to study the effect of specific exercises on developing key motor abilities and basketball shooting skills in female students. The focus is on employing innovative training methods to improve physical and technical performance. The study's findings are expected to provide practical recommendations to enhance the training and educational process in basketball.

Research problem

The researcher observed, through practical experience and review of basketball training programs, that many coaches fail to consider game-specific energy systems during training. This lack of attention impacts key mental and physical indicators during matches. Given the unique characteristics of training female students, it is crucial for coaches to adapt training programs to address these needs.

Developing movement-related factors such as reaction speed, quick decision-making, and motor response is essential in sports training. However, a lack of scientific competence among coaches often leads to suboptimal training practices. This gap necessitates designing appropriate exercises that enhance essential skills, particularly shooting, which is a key determinant of success in matches. Addressing this problem is the primary focus of the study.

Research Objectives

1. Designing specific exercises to develop key motor abilities and basketball shooting skills in female students.
2. Evaluating the impact of specific exercises on motor abilities and basketball shooting skills in female students.

Research Hypothesis

- Specific exercises have a statistically significant positive effect on developing motor abilities and basketball shooting skills in female students.

Scope of the Research

- **Participants:** Female students from the Department of Physical Education and Sports Sciences, College of Education for Women, University of Kufa.
- **Time Frame:** From November 1, 2023, to April 1, 2024.
- **Location**: Sports hall at the Department of Physical Education and Sports Sciences, College of Education for Women, University of Kufa.

Research Methodology

The researcher used the experimental method with a pretest-posttest design for two equivalent groups (control and experimental), suitable for the nature of the study.

Study Sample

The study population consisted of 35 second-year female students from the Department of Physical Education and Sports Sciences at the University of Kufa. A simple random sample of 30 students was selected, divided equally into control and experimental groups (15 students each). A pilot study was conducted with five students to refine the research methodology.

Sample Homogeneity

After dividing the sample into two groups, to avoid the effects of individual differences among students that could influence the research outcomes, and to ensure a uniform and equal level among the sample, certain variables were identified to verify the sample's homogeneity. These variables, deemed influential in the experiment, needed to be controlled. Statistical analysis using the skewness coefficient was conducted, as shown in Table (1). It was found that the skewness coefficient for these variables ranged between (±1), indicating that the sample was normally distributed. It is noted that "when the skewness coefficient values range between (±1), the sample is considered homogeneous.2

Table 1. It shows variables, mean values, standard deviation, median, and skewness coefficient.

No.	Measurements and Tests	Unit	Mean	Median	Std. Deviation	Skewness	Significance
1	Height	(cm)	161.5	162	11.45	-0.13	Not significant
2	Weight	(kg)	59.62	61	4.35	-0.95	Not significant
3	Age	(years)	21.42	21	1.49	0.85	Not significant

Equivalence of Research Groups

The researcher ensured that the groups were equivalent in terms of the variables related to the research to attribute any differences in outcomes to the independent variables. To verify the equivalence of the research groups, an independent samples t-test was conducted. The results are shown in Table (2).

Table 2. Shows statistical parameters and the t-test values for skill variables of the research groups.

Variables	Control (Mean ± SD)	Experimental (Mean ± SD)	t-Value	Sig. Level (p-value)	Type of Significance
Maximum Speed	4.61 ± 0.29	4.32 ± 0.53	1.27	0.120	Random
Explosive Leg Power	1.34 ± 0.42	1.31 ± 0.36	1.63	0.881	Random
Core Strength	18.54 ± 3.32	19.36 ± 3.45	1.27	0.728	Random
Passing and Receiving	3.21 ± 0.46	3.13 ± 0.76	0.89	0.518	Random
Shooting Accuracy	3.67 ± 0.47	3.26 ± 0.45	1.53	0.554	Random

From Table (2), it is evident that the differences between the research groups in motor abilities and basketball shooting skills were not statistically significant ($p > 0.05$). This indicates that the groups were equivalent in the studied variables.

Tests Used in the Research

Physical Tests3

1. Name of Test: 20-meter Speed Test
2. Name of Test: Medicine Ball Throw
3. Name of Test: Standing Broad Jump

Skill Tests

- Shooting Skill Test from a Stationary Position in Basketball

Pilot Study

To evaluate the adequacy of the equipment used, identify potential challenges, and ensure smooth implementation, the researcher conducted a pilot study involving three students on Monday, November 19, 2023, at 10:00 AM. The objectives were:4

1. Assessing the team's adherence to assigned tasks.
2. Determining the time required for the test.
3. Evaluating the sample's understanding and responsiveness to the test.

Based on this study, adjustments were made to address any errors or challenges faced during the execution of the experiment.

Validity, Reliability, and Objectivity of the Tests

The researcher ensured the reliability of the tests by using the test-retest method with a seven-day interval under identical conditions. The simple correlation coefficient (r) was employed to determine test reliability. For example, the 30-meter sprint test demonstrated high reliability with a coefficient of 0.99 at 11 degrees of freedom.

To confirm validity, the square root of the reliability coefficient was calculated, indicating a high validity level of 0.99. The objectivity of the tests was verified through expert review, ensuring clear instructions and consistent scoring.

Field Experiment

1. Pre-Tests

The pre-tests for physical and shooting skills in basketball were conducted at 10:00 AM. All participants attended, and the tests were performed in the specified order while maintaining consistent conditions (location, timing, and method) to ensure comparability with the post-tests.

2. Procedures for Developing Specific Exercises

The training program was designed based on specialized scientific sources and consultations with experts in sports training and basketball. The program consisted of 24 sessions over eight weeks (three sessions per week). The content included progressive training principles such as feedback and error correction to maximize training efficiency. The program adhered to the concept of training fluctuation, balancing intensity, volume, and rest for optimal results.

3. Post-Test

The post-tests were conducted on Monday, March 28, 2024, following the same procedure as the pre-tests. All variables and requirements (time, location, equipment) were controlled to ensure consistency.

Results

The research results related to physical attribute tests were derived from the data collected during the pre- and post-tests conducted on the sample group. The data was statistically analyzed using the t-test to determine the significance of differences between correlated means, thus verifying the research objectives and hypotheses.

1. Results of the Speed Attribute in the 20-Meter Flying Start Test: Analysis and Discussion

Table 3. Shows the mean, standard deviation, and computed and tabulated t-values for the 20-meter flying start test results for the sample group in the pre- and post-tests.

Test	Mean (S)	SD (σ)	Mean (S)	SD (σ)	Computed t-value	Result
Pre-Test	4.23	0.77	3.62	0.44	3.15	Significant

From the results shown in Table (3), it is clear that there are differences in the mean and standard deviation values for the 20-meter flying start test, indicating a significant difference in favor of the post-test.

The researcher attributes this improvement to the implementation of the specific training program, which involved structured exercises designed to enhance speed. The exercises provided clarity for the students on what was expected during the lessons, focusing on progressive tasks that emphasize the development of speed. As stated by Mohamed Osman (1990), "Speed is one of the most critical factors influencing basketball skills."5

The research emphasized developing this attribute due to its importance in basketball. The approach allowed students to take responsibility for their learning during physical education lessons, which promoted independence and self-reliance. This positive engagement in the learning process led to significant improvements in speed.

Results of the Standing Broad Jump Test: Analysis and Discussion

Table 4. Shows the mean, standard deviation, and computed and tabulated t-values for the standing broad jump test results for the sample group in the pre- and post-tests.

Test	Mean (S)	SD (σ)	Mean (S)	SD (σ)	Computed t-value	Result
Pre-Test	135 cm	17.98	148 cm	18.86	4.55	Significant

From Table (4), it is evident that there are significant differences in the mean and standard deviation values for the standing broad jump test, favoring the post-test.

The researcher attributes this improvement in lower-limb explosive strength to the specific training exercises included in the program. These exercises targeted both strength and speed due to the dynamic relationship between these two attributes. The source of both attributes lies in the muscles of the legs.6

The positive results are also attributed to the motivational role of the training exercises, which enhanced the students' knowledge and skills. The freedom to choose study settings, times, and tools, combined with immediate feedback and reinforcement, played a critical role in improving performance.

Results of the Abdominal Muscle Strength Test (Sit-Ups): Analysis and Discussion

Table 5. Shows the mean, standard deviation, and computed and tabulated t-values for the sit-up test results for the sample group in the pre- and post-tests.

Test	Mean (S)	SD (σ)	Mean (S)	SD (σ)	Computed t-value	Result
Pre-Test	18.07	8.92	32	14.5	5.41	Significant

From Table (5), the results indicate significant differences in favor of the post-test, reflecting the positive impact of the specific training exercises on abdominal muscle strength.

These exercises improved the efficiency of the core muscles through a variety of movements such as running and jumping. The mechanical principle that increased muscle strength enhances acceleration supports these findings.7

Educational tools like diagrams, videos, and CDs also played a significant role in helping students visualize and learn the required movements, fostering self-directed learning and aligning with modern performance demands.

Results of Basketball Skills Test: Analysis and Discussion

Table 6. Shows the mean, standard deviation, and computed and tabulated t-values for the basketball shooting skill test results for the sample group in the pre- and post-tests.

Skill	Pre-Test (Mean ± SD)	Post-Test (Mean ± SD)	Computed t-value	Result
Shooting Skill	3.25 ± 0.59	6.82 ± 0.97	6.19	Significant

Table (7) shows a significant improvement in shooting skills in favor of the post-test. This improvement highlights the effectiveness of the specific training exercises in enhancing the students' shooting performance.8

The targeted training program focused on technical and motor aspects, which improved precision and stability during shooting. Continuous feedback and the use of interactive learning tools helped students correct errors and improve their performance over time.

CONCLUSIONS

1. The study demonstrated that specific exercises significantly improved motor abilities in students, including maximum speed, explosive strength, and core strength, highlighting the positive impact of the training program on overall physical fitness.
2. Specific exercises led to notable improvements in shooting skills, reflecting their effectiveness in developing practical and fundamental basketball skills.
3. The integration of specific exercises as a comprehensive educational tool combining theoretical and practical elements enhanced motor and physical skills, allowing students to improve their field performance effectively.

RECOMMENDATIONS

1. Specific exercises should be incorporated as an essential part of the basketball training curriculum to enhance students' motor and technical abilities and improve their sports performance across various activities.
2. Similar educational tools focusing on developing fundamental motor abilities should be utilized due to their significant impact on physical and skill development.
3. Future studies should evaluate the effects of educational packages on other sports and activities to broaden the understanding of skill development potential in diverse athletic contexts.

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