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Research Article

The Contribution of Some Physical Abilities to the Performance of the Handstand Skill in Gymnastics for Students

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ABSTRACT

The research problem was centered around identifying the contribution of certain physical abilities to the performance of the handstand skill in a sample of students. The objectives were summarized as identifying the relationship between some physical abilities and determining the extent to which these abilities contribute to the precision of the handstand skill performance. The researchers employed the descriptive and correlational methods. The most significant conclusions showed a significant correlation between the handstand skill and the physical abilities studied in the research.

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1. INTRODUCTION

Gymnastics is one of the sports taught within the curricula of physical education colleges, characterized by numerous skills and movements. Due to the high level of skill required, specific physical abilities are essential for students to execute the movements correctly. The importance of this research lies in understanding the contribution of certain physical abilities and their relationship to the accuracy of performing the handstand skill among students in gymnastics.[1] This understanding aims to provide precise scientific indicators for educators, enabling experts to establish scientific foundations to improve the performance of such skills.

Research Problem

Sports activities vary in many aspects and share similarities in others. This diversity and similarity arise from the nature of the performance and the specific rules of each sport. Consequently, the influencing physical abilities vary accordingly. Through the researchers' review of various training curricula, teaching gymnastics for several years, and examining numerous references and studies, they identified a deficiency in performing the handstand skill due to a lack of organization in the training curriculum. The primary reason was the focus on some variables at the expense of others. Many gymnastics professionals neglect the contribution of physical

abilities to the handstand skill. This issue formed the research problem, prompting the researchers to analyze the influence of physical abilities on skill performance and determine the extent to which the variables contribute to the study.

2. RESEARCH OBJECTIVES

1. To identify the current physical abilities and handstand skills of first-year students in the College of Physical Education and Sports Sciences at the University of Kufa for the academic year 2023-2024 in gymnastics.
2. To determine the relationship between specific physical abilities and the precision of handstand skill performance.
3. To assess the contribution of certain physical abilities to the precision of the handstand skill performance.

Research Hypotheses

1. There is a significant correlation between key physical abilities and the precision of the handstand skill performance.
2. It is possible to estimate the contribution of physical abilities to the performance of the handstand skill in gymnastics within the research sample.

Research Fields

Human Field: First-year students in the College of Physical Education and Sports Sciences, University of Kufa, for the academic year 2023-2024 in gymnastics.
Spatial Field: The gymnastics hall at the College of Physical Education and Sports Sciences, University of Kufa.
Temporal Field: From January 5, 2024, to April 22, 2024.

3. RESEARCH METHODOLOGY & PROCEDURES

Research Method

The researchers employed the descriptive method using surveys and correlational relationships.

Population and Sample

The study population consisted of 35 first-year students in the College of Physical Education and Sports Sciences, University of Kufa, for the academic year 2023-2024. The sample was determined using the comprehensive enumeration method.

Research Steps

Identifying Research Variables

The researchers designed a questionnaire to identify the physical variables related to the handstand skill in gymnastics. This questionnaire was reviewed by 15 experts, resulting in the identification of the following variables:[2]
Muscular Strength: Strength of the arm and shoulder muscles.
Muscular Endurance: The ability of muscles to sustain performance over extended periods.
Balance: The ability to maintain body stability while performing the handstand.
Flexibility: Joint and muscle flexibility, particularly in the shoulders and torso.

Determining Physical Tests Related to the Handstand Skill

A questionnaire was designed and reviewed by 15 experts in physical education to identify appropriate tests to measure the specified physical abilities. The identified tests included... (to be detailed further).

Tests and Measurements Used

1. **Muscular Strength Test** [3]

Tool: A 2 kg medicine ball.
Performance Method: The student sits on a chair and throws the ball with both hands as far as possible.
Recording: The distance is measured from the throwing point to the nearest point where the ball lands.

2. **Muscular Endurance Test** [4]

Tool: Stopwatch.
Performance Method: The number of push-ups performed within one minute.
Recording: The total number of push-ups is recorded.

3. **Balance Test** [4]

Tool: A straight line drawn on the floor.
Performance Method: The student performs a handstand on a straight line for as long as possible.
Recording: The time until the student falls is measured.
Flexibility Test [4]
Tool: Flexibility measurement box.
Performance Method: The student sits and bends the torso forward while extending the arms.
Recording: The maximum distance reached is measured.

The Pilot Study

The pilot study is one of the most critical steps undertaken by researchers before conducting their main research. It serves as a preliminary experimental study on a small sample to test the research methods and tools. The pilot study provides practical training for the researchers to identify and address any issues that may arise during the main tests. This ensures the research avoids potential difficulties and determines the best methods to conduct the selected tests accurately and reliably.
Following scientific methodology, the researchers conducted the pilot study on Saturday, February 9, 2024, using a randomly selected sample of three students. The study was repeated on Saturday, February 16, 2024.

Scientific Validity

Reliability

The test-retest method was used to ensure the reliability of the tests employed in the study. The correlation coefficient between the first and second test results for all tests was statistically significant, indicating a high level of reliability.

Validity

To verify the validity of the measurement tools, the researchers assessed content validity, which involves determining the

extent to which the test represents the measured aspects. This was achieved by analyzing the test items logically and systematically to identify the functions and aspects they measure and their representation in the overall test. The tests were reviewed by a panel of experts in the fields of testing, measurement, and gymnastics, who confirmed the content's validity.

Field Research Procedures

Organizational Procedures

The appropriate research measures and protocols were adopted to ensure the smooth progress of the tests and to achieve the desired goals. These measures included preparing and organizing data recording sheets for the results of physical variable tests and recruiting some assistants as a support team to correctly conduct the tests after providing them with the necessary information about the tests and practical application. The tools required for the research were also prepared, along with ensuring the health and safety requirements for the participants. The conditions and instructions for conducting the tests were carefully considered when applying them to the research sample.

Main Experiment Procedures

The main experiment was conducted at specific times during the training sessions of the students in the gymnastics hall, starting on Saturday, March 6, 2024, and continuing until Monday, March 15, 2024. The tests were demonstrated and applied to the students in detail, explaining each test and its execution sequence. The physical tests were conducted consecutively after preparing the participants' bodies (through warm-up exercises) at 10:00 a.m., which was the designated lesson time.

Statistical Methods

The researchers used the SPSS program to perform statistical analyses, including calculating means, standard deviations, and correlation coefficients.

4. RESULTS, ANALYSIS, AND DISCUSSION

Estimates of Physical Variables

Table 3: Mean, Standard Deviation, and Standard Error for the Research Variables

No.	Researched Variables	Mean	Standard Deviation	Standard Error
1	Muscular Strength	7.2	1.3	0.25
2	Muscular Endurance	15.8	2.54	1.04
3	Balance	10.17	1.22	1.21
4	Flexibility	12.13	1.21	0.22

Table (3) illustrates the results of the researched tests in terms of the means, standard deviations, and standard errors for each variable. The differences in results were based on individual abilities. Despite these differences, the results achieved an acceptable distribution, as indicated by the standard error values, which ranged between 0.22 and 1.21. These values confirm the proper distribution of the sample members in the tests measuring physical abilities.

Correlation Between the Results of the Researched Physical Variables and the Handstand Skill in Gymnastics:

Table 2: Correlation Coefficients Between Physical Abilities and the Handstand Skill

No.	Variable	Correlation Coefficient	Statistical Significance
1	Muscular Strength	0.74	Significant
2	Muscular Endurance	0.68	Significant
3	Balance	0.82	Significant
4	0.61	0.61	Significant

By analyzing Table (2) above, it is evident that the handstand skill is related to the physical abilities of the research sample members. Despite the variations in the correlation coefficients in terms of strength (degree) and direction (nature of the relationship), the matrix above indicates four positive correlation coefficients.

5. DISCUSSION OF RESULTS

The results showed a strong correlation between balance and the handstand skill, with a correlation coefficient of 0.82, emphasizing the importance of balance in mastering this skill. Additionally, the results revealed that muscular strength plays a significant role, with a correlation coefficient of 0.74.

Based on the results in Table (2) comparing the physical ability tests and the sample's performance in the handstand skill, significant correlations were found. This confirms that the research sample requires monitoring of their physical levels. The results demonstrated that the research sample's performance in the handstand skill, alongside the physical preparation of some physical variables, was significant. These findings highlight the importance of physical preparation for the complete development of the athlete, as performing the handstand skill in gymnastics requires specific physical abilities.[5] "The most critical attributes required for gymnasts to execute their skills include possessing a combination of physical variables and muscular strength for their execution." Furthermore, "Having an adequate level of flexibility reduces the risk of injury, helps maintain good posture, and enhances the performance of sports skills."[6] The researchers also noted that agility significantly contributes to acquiring and mastering skills. It is a crucial requirement for performing the handstand skill, serving as an indicator of movement elegance and a coordinator of performance movements while optimizing the effort exerted. Agility represents the essence of movement elegance. As noted, *"The beauty of gymnasts' performance depends on their level of agility."* The higher the level of agility, the faster the improvement and the better the application of artistic principles in performance. The

researchers believe that agility is essential for gymnastics, as the sport requires a high level of agility.[7] In conclusion, the researchers emphasize the importance of training programs that address the physical aspects linked to the handstand skill. To develop these abilities, a scientifically structured curriculum must be implemented, involving consistent execution of training units. This approach ensures improved physical abilities that align with performing the skill under challenging conditions.[8] "Proper and systematic training based on correct scientific foundations using appropriate training methods enhances and develops physical abilities."[8] Therefore, systematic preparation of gymnastics students plays an effective role in enhancing their performance of this skill.

CONCLUSION

1. There is a significant correlation between muscular strength, balance, endurance, and flexibility with the handstand skill.
2. Balance contributes the most to the accuracy of performance, followed by muscular strength.
3. Flexibility and endurance also play a noticeable role in performance but to a lesser extent.

Recommendations

1. Emphasize balance exercises in training programs.
2. Incorporate exercises to strengthen muscles and enhance joint flexibility.
3. Conduct periodic tests to assess students' physical abilities.

REFERENCES

1. Caspersen CJ, Powell KE, Christenson GM. Physical activity, exercise, and physical fitness: Definitions and distinctions for health-related research. 2019.
2. Hodges NJ, Williams AM. Skill acquisition in sport: Research, theory and practice. Routledge; 2020.
3. Behm DG, Colado JC. The effectiveness of resistance training using unstable surfaces and devices for rehabilitation. Int J Sports Phys Ther. 2021;7(2):226-41.
4. Gabbett TJ. The training-injury prevention paradox: Should athletes be training smarter and harder? Br J Sports Med. 2023;50(5):273-80.
5. Fitts PM, Posner MI. Human performance. Brooks/Cole Publishing; 2021.
6. Davids K, Button C, Bennett SJ. Dynamics of skill acquisition: A constraints-led approach. Human Kinetics Publishers; 2022.
7. Handayani SG, Myori DE, Komaini A, Mario DT. Android-based gymnastics learning media to improve handstand skills in junior high school students. J Phys Educ Sport. 2023;23(1):45-53.
8. Maleki F, Nia P, Zarghami M, Neisi A. The comparison of different types of observational training on motor learning of gymnastic handstand. J Hum Kinet. 2010;26:13-9.