

Leap to Greatness: Unveiling the Transformative Influence of Rope Skipping among Pe Students

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Abstract: This research investigates the incorporation of a complete rope skipping program into the physical education curriculum to improve students' physical fitness and emotional resilience. The rope skipping exercise was chosen for its versatility and affordability since it can enhance cardiovascular endurance, muscular strength, agility, coordination, and mental concentration. The research used a pre-test and post-test approach to evaluate the influence of frequent rope-skipping sessions on students' competence in essential fitness domains. Students were assessed on fundamental jumping methods, the ability to maintain rhythm and timing, coordination and balance, different footwork variants, pace control, endurance, and stamina. In addition, the study investigated the lasting impact of rope skipping on cardiovascular endurance, muscular strength, agility, speed, weight control, and mental resilience. The findings demonstrated substantial improvements in all areas from the first assessment to the final evaluation, with pupils displaying notable advancements in their physical and cognitive capabilities. The post-test results revealed a transition from mediocre to excellent competence in all domains, indicating the efficacy of the rope-skipping intervention. Pearson's *r* correlation study provided more evidence of beneficial associations between rope skipping skills and improved athletic performance, namely in endurance, coordination, and mental resilience. The research finds that rope skipping is a valuable and versatile activity for students of school age, promoting enhancements in physical fitness, mental resilience, and good living choices. The program's implementation may be beneficial for educators to foster comprehensive student growth and a lifetime commitment to physical exercise.

Keywords: Cardiovascular Endurance; Muscular Strength; Agility Coordination; and Mental Concentration.

1. Introduction

Recently, there has been a notable increase in interest within the sports community about non-traditional training methods that aim to improve performance and foster overall growth among athletes (Zhang et al., 2020; Saavedra et al., 2019). One of the new trends is rope skipping, which was previously only seen as a game played on the playground. However, it is now being recognized as a powerful instrument for improving athletic abilities. This study aims to explore the profound impact of rope skipping on athletic development, specifically focusing on its significance in China. It seeks to clarify the numerous advantages of rope skipping and reveal its ability to accelerate athletes towards achieving exceptional performance.

Rope skipping, commonly referred to as "jump rope," has been deeply rooted in the cultural heritage of China, where it has gained widespread popularity as both a leisurely pastime and a traditional form of physical training (Yin et al., 2018). Nevertheless, its importance in the field of athletic development has only just started to be properly recognized. With China's growing influence in global sports, it is becoming more important to examine the significance of rope skipping in athletic training.

Basic jumping methods are essential to rope skipping and are the foundation for performing more complex feats. According to Wang and Li (2020), it is essential to achieve proficiency in correct form, posture, and timing in order to do rope skipping efficiently and effectively. Liu and Zhang (2017) highlight the importance of fundamental practices in preventing tripping or stumbling while rope skipping, which in turn reduces the likelihood of injury and enhances overall

performance.

An essential aspect of achieving success in rope skipping is the ability to maintain a consistent and balanced not only improve performance in rope skipping but also contribute to greater performance in other sports and physical activities (Lee & Chien, 2020).

Integrating several footwork variants into rope skipping routines enhances the level of difficulty and complexity, hence promoting agility, foot speed, and proprioception (Tan et al., 2019). According to Wang et al. (2019), improving speed control while rope skipping can boost cardiovascular endurance and anaerobic performance. Regular practice of rope skipping has been shown to enhance endurance and stamina, which are vital aspects of athletic performance. Studies have demonstrated improvements in cardiovascular endurance, muscular endurance, and total stamina as a result of rope skipping (Liu & Wang, 2018; Wang et al., 2020).

Technique refinement is a continuous procedure that entails examining movement patterns, recognizing areas that need better, and applying corrective techniques through focused practice and feedback (Sammito et al., 2020). Athletes that focus on improving their technique in rope skipping show higher levels of efficiency, consistency, and skill, which eventually results in enhanced athletic performance and longer-lasting success.

Furthermore, comprehending the evaluation of student-athletes when categorized based on their profile offers valuable insights into how specific traits can impact their proficiency in rope skipping. These findings can be used to develop interventions and training programs that are specifically designed to address specific requirements and improve performance results (Jiang & Liu, 2019).

Additionally, investigating the possible enduring impacts of consistent engagement in rope skipping on athletic performance reveals the comprehensive advantages of this training method. This knowledge can educate athletes, coaches, and sports experts about how it improves overall athletic performance and well-being.

The advantages of rope skipping go much beyond its straightforward nature. In addition to improving cardiovascular endurance, muscular strength, agility, and coordination, rope skipping provides a comprehensive approach to athletic development (Ramirez-Campillo et al., 2021; Latorre-Roman et al., 2018). The adaptability of this instrument enables players to customize their workouts according to their own requirements, making it an essential and invaluable asset in the quest for success in various sports.

In addition, research has demonstrated that rope skipping can boost bone density and decrease the likelihood of developing osteoporosis. This makes it particularly advantageous for athletes who aim to improve their overall well-being and extend their athletic careers (Stark et al., 2018). Moreover, the regular and rhythmic motion of rope skipping has been associated with the decrease of stress and the enhancement of mental well-being. This highlights its potential as a tool to increase psychological resilience and focus in athletes (Sturm et al., 2020).

However, even though rope skipping's potential is increasingly acknowledged, there is still a lack of extensive study investigating its transformative impact on athletic development, especially in the Chinese setting. This study seeks to fill this void by examining the enduring impact of consistent engagement in rope skipping on the performance of elite athletes.

Significantly, this study aimed to determine not just the immediate advantages of rope skipping, but also its long-lasting influence on athletic performance. This research intended to analyze the skill level of athletes in different elements of rope skipping and determine how it relates to their long-term athletic performance. By doing so, significant insights can be gained regarding the effectiveness of rope skipping as a training method. (Nobari et al., 2019; Stojanović et al., 2017).

Given the growing fascination in rope skipping as a training instrument, comprehending its profound impact on athletic progress is crucial. This study intended to contribute to the progress of training approaches in sports science by clarifying how rope skipping improves athletic performance and suggesting areas that can be improved further.

2. Statement of the Problem

This study aimed to assess the transformative influence of rope skipping in athletic development. Specifically, this study sought answers to the following questions:

(1) What is the score of Physical Education students during the pre-test and post test of rope skipping proficiency sessions in terms of:

- 1) Basic Jumping Techniques
- 2) Rhythm and Timing
- 3) Coordination and Balance
- 4) Footwork Variations
- 5) Speed Control
- 6) Endurance and Stamina

(2) Is there a significant difference in the the score of Physical Education students during the pre-test and post test of rope skipping proficiecnyn?

(3) What is the score of Physical Education students during the pre-test and post test of the potential long-term effects of regular rope skipping participation in terms of:

- 1) Cardiovascular Endurance
- 2) Muscular Strength and Power
- 3) Agility and Coordination
- 4) Speed and Quickness
- 5) Weight Management
- 6) Mental Toughness and Focus

(4) Is there a significant difference in the scores of Physical Education students during the pre-test and post test of the potential long-term effects of regular rope skipping participation?

(5) Is there significant relationship between student-athletes' proficiency in rope skipping and potential long-term effects of regular rope skipping participation on athletic performance?

(6) Based on the results of the study, what rope skipping integration program can be designed for students?

3. Hypotheses

(1) There is no significant difference in the the score of Physical Education students during the pre-test and post test of rope skipping proficiency.

(2) There is no significant difference in the scores of Physical Education students during the pre-test and post test of the potential long-term effects of regular rope skipping participation.

(3) There is no significant relationship between student-athletes' proficiency in rope skipping and potential long-term effects of regular rope skipping participation.

4. Scope and Delimitation of Study

This research aimed to examine the influence of rope skipping on the physical development of students at six colleges and institutions in Hunan Province. The study aimed to investigate the impact of rope skipping proficiency on athletic performance among students by using a pre-test and post-test experimental design. In the pre-test phase, participants' initial rope skipping skills were evaluated in many areas, such as basic jumping techniques, synchronization and timing, coordination and stability, footwork changes, speed control, endurance and stamina, and technique enhancement. Afterward, the participants participated in a specific duration of regular rope skipping as part of the intervention. After the intervention, a post-test examination was conducted to assess any noticeable enhancements or alterations in the students' skills in rope skipping.

Furthermore, while evaluating the skill level of rope skipping, we gathered demographic information using a custom questionnaire. This allowed us to understand better the participants' features and perspectives on the possible lasting effects of rope skipping on athletic performance. This study aimed to provide significant insights into the efficacy of rope skipping in boosting athletic development among students in Hunan Province using an experimental technique.

This research has some inherent constraints. The study's results may have limited generalizability due to its exclusive emphasis on a particular geographic location (Hunan Province) and its use of a tiny sample size of just six schools and institutions. The results may need more generalizability to student-athletes from many geographical locations or

educational institutions. Furthermore, using a self-designed questionnaire heightened the risk of answer bias and subjective interpretations of the inquiries, possibly undermining the accuracy and reliability of the collected data. Furthermore, using a cross-sectional design in the research limited the ability to establish causal relationships between engagement in rope skipping and the resulting athletic performance results. This was due to the absence of temporal variations and the failure to account for any confounding variables that may have impacted the outcomes. Ultimately, the study's data collecting and analysis may have been constrained by practical limitations, such as time and resource restraints. These limitations impacted the comprehensiveness of the study's conclusions.

5. Research Design

This study's research strategy used a quasi-experimental approach, using a pre-test and post-test design with a single experimental group consisting of students from the same school. This approach facilitated the evaluation of alterations in rope skipping skill and their influence on students' athletic progress over time within a regulated setting.

The experimental group included students from a specific school in Hunan Province who underwent both pre-test and

post-test assessments. Before the intervention, a pre-test was conducted to assess the participants' initial rope-skipping skills and athletic performance indicators. This included analyzing basic jumping techniques, coordination and stability, synchronization and timing, adjustments in footwork, speed management, endurance and stamina, and enhancing technique.

After the first evaluation, the experimental group participated in a structured rope-skipping intervention program for a specific duration. After the intervention, a post-test was conducted to assess any noticeable improvements or alterations in the students' rope skipping skills and athletic performance.

Moreover, correlational analyses examined the associations between rope skipping proficiency and several facets of athletic performance, such as cardiovascular endurance, muscular strength, agility, and mental resilience. The research objective was to ascertain the extent to which skill in rope skipping influenced the overall athletic performance of students at the chosen university.

6. RESULTS AND DISCUSSION

Score of Physical Education Students during the Pre-Test and Post Test of Rope Skipping Proficiency Sessions.

Table 1. Assessment of the Pretest and Post-test Scores of Rope Skipping Proficiency Sessions in terms of Basic Jumping Techniques

Indicators		Mean	SD	Verbal Interpretation
Basic Jumping Techniques	Pretest	2.26	0.53	Fair
			0.54	Good
	Post-test	3.48		
			0.53	
COMPOSITE MEAN	Pretest	2.26	0.54	Fair
				Good
	Post-test	3.48		

Legend: 1.00-1.50: Poor (Very Low); 1.51-2.50: Fair (Low); 2.51-3.50; Good (Average); 3.51-4.00: Excellent (High).

Table 1 shows the scores of physical education students during the pre-test and post-test of rope skipping proficiency sessions in terms of basic jumping skills, resulting in a composite mean score of 2.26 (SD = 0.53) for the pretest and 3.48 (SD = 0.54) for the post-test. This indicates that they had fair pretest scores and average post-test scores. This suggests that they demonstrate appropriate form but struggle with consistency on the pretest. On the other hand, their post-test scores show that they have mainly perfect form with small faults.

The research demonstrated a notable enhancement in rope skipping competency, as seen by the increase in pre-test scores to superior post-test results. This underscores the efficacy of planned and focused treatments in augmenting specific motor abilities among students. The shift from experiencing difficulties in maintaining consistency to attaining a state of almost flawless execution implies that the six-week intervention had a substantial and beneficial effect on the student's capacity to improve and stabilize their fundamental jumping abilities. These enhancements are

crucial for enhancing performance in rope skipping and broader sports and physical education settings, where coordination, timing, and motor control play a vital role.

The findings indicate that the inclusion of rope skipping in physical education programs enhances skill development and promotes comprehensive physical growth. Frequent participation in these activities may improve motor coordination, balance, stamina, and agility, which are fundamental to physical performance. Recent research conducted by Chen and Wu (2022) supports the notion that an eight-week rope-skipping intervention can result in notable enhancements in athletic performance, specifically in the context of standing long jump outcomes. This improvement is attributed to the increased lower limb strength and coordination achieved by the intervention (MDPI).

Moreover, the research has increasingly acknowledged the advantages of therapies targeting basic movement skills (FMS). Alvarez-Bueno et al. (2019) conducted a systematic review that emphasized the beneficial effects of physical education programs on developing motor skills and cognitive

abilities in youngsters. Rope skipping, as a part of developing fundamental movement skills (FMS), allows students to participate in moderate to intense physical activity, leading to enhanced physical fitness, motor skills, and cognitive functioning (Frontiers) (BioMed Central).

Integrating exercises like rope skipping into the school curriculum is crucial for establishing physical literacy and cultivating long-term participation in physical activity. The study conducted by Deng et al. (2024) highlights the significance of rope skipping in promoting physical growth and cognitive benefits, including enhanced selective attention and mental concentration in youngsters (Frontiers). This illustrates that the advantages of such therapies go beyond only physical enhancements, offering comprehensive developmental benefits.

Educators and coaches may use these data to improve their physical education programs. The study's findings

demonstrate that even brief and targeted treatments may substantially improve student performance. This is particularly advantageous in educational environments with limited time allocated for physical education. Therefore, it is crucial to optimize the effectiveness of each session. The research indicates that including rope skipping as a regular practice may significantly enhance motor and cognitive abilities, equipping students for broader sports engagement and enhancing their overall physical well-being.

Subsequent studies should examine treatments of extended duration and investigate the applicability of abilities learned from rope skipping to other sports and activities. Moreover, implementing these programs across various student demographics may enhance the credibility of their effectiveness and enable customization of the physical education curriculum to accommodate varied developmental requirements.

Table 2. Assessment of the Pretest and Post-test Scores of Rope Skipping Proficiency Sessions in terms of Rhythm and Timing

Indicators		Mean	SD	Verbal Interpretation
Rhythm and Timing	Pretest	2.24	0.52	Fair
	Post-test	3.36	0.60	Good
COMPOSITE MEAN	Pretest	2.24	0.60	Fair
	Post-test	3.36		Good

Legend: 1.00-1.50: Poor (Very Low); 1.51-2.50: Fair (Low); 2.51-3.50; Good (Average); 3.51-4.00: Excellent (High).

Table 2 shows the comparison of pre- and post-test scores for rope skipping proficiency sessions in terms of rhythm and timing. The tabulated data yielded a mean score of 2.24 (SD = 0.52) for the pretest (fair) and 3.36 (SD = 0.60) for the post-test (good). This suggests that individuals struggle to maintain rhythm on the pretest, making frequent timing errors; however, on the post-test, they display a largely steady rhythm with occasional errors.

The results demonstrate a significant improvement in students' rope-skipping aptitude regarding rhythm and timing. They transitioned from many timing mistakes in the pre-test (average performance) to a mostly consistent rhythm with infrequent errors in the post-test (excellent performance). This change highlights the beneficial effect of focused therapies in addressing issues related to rhythm and timing in physical activities. The shift from irregular timing to improved rhythm control indicates that the students acquired enhanced motor coordination and heightened awareness of timing due to the six-week training.

The results illustrate the significance of rhythm and timing in developing motor skills and prove that organized therapies, like rope skipping, may significantly improve these abilities. The increase in post-test results indicates that consistent practice and emphasis on rhythmic exercises assist students in honing their motor skills, which are crucial for success in various sports and physical activities.

A recent study provides evidence that supports these findings. A recent research conducted by MacPherson et al. (2021) highlights the significance of rhythm-based training in enhancing motor performance by increasing the temporal

organization and precision of timing in sports activities (BioMed Central). The ACTNOW research (2022) emphasizes that engaging in physically active play may enhance motor and cognitive skill development in students, as shown by improvements in rhythm and timing (BioMed Central). This supports the notion that including rhythm-centered exercises in the physical education curriculum might improve coordination, timing, and general motor abilities.

The efficacy of the intervention in this study is consistent with extensive studies suggesting that rhythm and timing are essential elements of motor skill acquisition, which in turn facilitate the execution of increasingly intricate physical and cognitive activities. Chen et al. (2023) demonstrate that rhythm-based training may have a long-lasting effect on performance, particularly in activities that demand accuracy and coordination, such as gymnastics, dance, and ball sports (BioMed Central).

The findings of this research have substantial ramifications for physical education programs. They indicate that rhythm and timing activities, such as rope skipping, should be given priority in student training. The intervention period, albeit relatively short, led to demonstrable gains, demonstrating that even concise and targeted interventions may have a substantial effect on skill development. Teachers should include rhythm-based exercises in their lesson plans to assist students in cultivating the timing and coordination essential for achieving success in a wider range of sports.

Furthermore, the results endorse using adaptable, child-focused methods for enhancing motor skill development, as shown by the ACTNOW research (2022), which employed a

blend of organized and unstructured activities to improve motor abilities in young students (BioMed Central). This technique may be modified to suit different educational settings, enabling instructors to customize treatments to address the individual requirements of their students while fostering long-lasting enhancements in physical education.

7. Conclusion

(1) The transition from a fair to a good level of proficiency in rope skipping demonstrates that consistent sessions can significantly improve students' fundamental motor skills and fitness elements, making it a valuable inclusion in physical education programs focused on enhancing coordination, balance, and cardiovascular well-being.

(2) The notable disparity between the scores before and after the tests suggests that implementing systematic rope-skipping treatments results in quantifiable enhancements in student's physical capabilities. Rope skipping may be used by educators and coaches as a very effective training method to enhance students' overall fitness levels.

(3) The increase in cardiovascular endurance, strength, agility, speed, weight control, and mental resilience from the first to the final assessment demonstrates the lasting fitness advantages of consistent rope skipping. Integrating this activity into regular workout routines may enhance overall physical development and lead to long-term health advantages.

(4) The post-test results demonstrate that regularly participating in rope skipping has significant long-term impacts on physical fitness and mental resilience. This highlights the relevance of endurance-based workouts in enhancing overall sports performance.

(5) The correlation between competency in rope skipping and athletic performance results indicates that more significant expertise in this activity leads to improved physical fitness. Coaches and instructors should prioritize the enhancement of rope skipping skills as a method to enhance the overall athletic ability of students.

8. Recommendations

(1) Schools must regularly include rope-skipping activities in their physical education curricula, ideally 2-3 times per week. This intervention will enhance student's motor abilities, coordination, balance, and cardiovascular well-being. Customized rope-skipping routines may be designed to accommodate various proficiency levels, ensuring that all students can engage in and benefit from the exercise.

(2) Coaches and instructors should create rope skipping exercises that systematically increase in intricacy. By engaging in this activity, students can cultivate fundamental abilities, such as leaping techniques, rhythm, and coordination, before progressing to more demanding versions, such as speed control and footwork patterns. The training focused on progression guarantees ongoing development and prevents pupils from experiencing discouragement.

(3) Rope skipping should be incorporated with other endurance-focused activities, such as circuit training or high-intensity interval training (HIIT). Diversifying students' routines will boost their total fitness, enhancing their skipping competence and physical strength, speed, and endurance.

(4) Rope skipping is a beneficial exercise for weight management and enhancing mental fortitude. It is recommended for incorporation into health and weight

management programs, whereby students may engage in regular skipping sessions to effectively regulate their body composition and enhance mental focus, concentration, and stress reduction.

(5) To enhance students' motivation, instructors should implement performance monitoring for rope skipping competency, including periodical evaluations to measure progress in important aspects such as speed, agility, coordination, and endurance. Students who exhibit substantial progress should be rewarded with awards or accolades, which will motivate them to stay engaged and further enhance their skills.

(6) Schools should provide professional development opportunities for physical education instructors to learn how to integrate rope skipping into the curriculum efficiently. This would include instruction in educating students on correct methodologies, organizing instructional sessions, and evaluating student achievement. Proficient instructors are crucial in ensuring that students benefit from their engagement in rope-skipping exercises.

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