



The Effect of the Traditional Jump Rope Game on the Motor Skills of Elementary School Students

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Abstract

Objectives: At SDN Soncoluka, physical education remains dominated by conventional methods that limit physical activity, causing students to struggle with movement coordination, balance, and agility, while showing a preference for sedentary digital games over traditional play. This study was motivated by the low level of motor skills among elementary school students, a factor that could potentially hinder the development of fundamental movement abilities. Therefore, this study aimed to analyze the impact of implementing the traditional game of jump rope on improving students' motor skills.

Materials and Methods: This study employed a quasi-experimental method with a one-group pretest-posttest design, involving 30 fourth-grade students (20 boys and 10 girls) from SDN Soncoluka, Bima Regency, selected via purposive sampling based on established inclusion and exclusion criteria. Students' motor skills were assessed using a physical performance test battery that combined Harold M. Barrow's motor tests—to measure neck muscle explosive power and agility with the Bruininks-Oseretsky Test of Motor Proficiency (BOT) to evaluate dynamic coordination and movement rhythm. Data were analyzed sequentially using descriptive statistics, the Shapiro-Wilk normality test, the Paired Sample t-Test, and effect size calculation (Cohen's d) at a significance level of $p < 0.05$, utilizing IBM SPSS Statistics 25.

Results: The research results indicate a significant improvement in motor skills following the implementation of the traditional jump rope game. The students' average score rose from 62.40 in the pre-test to 81.73 in the post-test, representing an increase of 30.98%. These findings are supported by the Paired Sample t-Test results ($t = -14.23$, $p < 0.001$) and a very large effect size (Cohen's $d = 1.87$), demonstrating that the progressive difficulty stages (Levels 1–3) consistently enhanced the students' physical capacity.

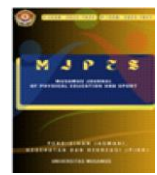
Conclusions: The traditional jump rope game is proven effective in enhancing students' motor skills while offering the potential to support local culture preservation. This study contributes an empirically backed, low-cost, and practical instructional template that enables PE teachers at SDN Soncoluka and similar local schools to restructure their sports curriculum using cultural-based physical activities to address neuromotor deficiencies.

Keywords: Traditional jump rope game; Motor skills; Physical education; Elementary school.

Introduction

Motor skills are a crucial aspect of primary school children's development, as they are linked to body coordination, balance, agility, and readiness for learning. Ideally, primary school instruction integrates active and enjoyable physical activities to ensure optimal motor skill development among students (Brian et al., 2021). Traditional games are an effective form of learning because they involve structured and interactive physical activities (Irawan et al., 2021). In addition to enhancing motor skills, traditional games also support students' social and emotional development through collaborative activities and hands-on experiences. Traditional play activities can even enhance children's fundamental movement skills through locomotor movements performed actively and repetitively (Mulyani & Pramudito, 2022).

Gross motor development in primary school-aged children involves complex biomotor components, including eye-hand-foot coordination, dynamic balance, agility, accuracy, and movement rhythm (Zahra, 2023). These components serve as a crucial kinetic foundation that supports both a child's daily physical functionality and their academic performance at school. During this primary school stage, the enhancement of a child's physical capacity is characterized by a more refined mastery of fundamental

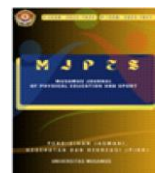


locomotor and non-locomotor movements, including the ability to maneuver, jump, and maintain bodily stability during physical activity (Hidayatulloh et al., 2026). Conceptually, the optimization of these biomotor elements cannot occur passively through natural growth alone; rather, it requires systematically designed external stimuli. Effective physical interventions must target neuromuscular conditioning pathways to train proprioceptive sensitivity and the efficiency of major muscle group contractions during movement transitions.

Furthermore, these biomotor components are stimulated through physical activities that are repetitive yet recreational, such as traditional jump rope games. In terms of movement mechanics, the game requires children to continuously adjust their visual estimation of the rope's rotation speed against precise timing specifically regarding reaction time during take-off and landing. This structured jumping activity directly activates neuromotor pathways, builds explosive power in the lower leg muscles, and fosters a consistent rhythm within a fun learning environment (Husaini & Mulyani, 2024). Utilizing these traditional games serves as a strategic solution amidst the trend of declining physical activity among children in the modern era, which tends to be dominated by exposure to digital devices (Kumar et al., 2025). Through the integration of movement mechanics and recreational psychological elements, the game of jump rope transcends its status as a mere activity rooted in local tradition, transforming instead into a functional plyometric training method adaptable for physical development.

In general, the gap between digital technological advancements and children's physical needs has triggered a global decline in motor activity; as reported by (Organization, 2020), prolonged device usage leads children to neglect physical play, which negatively impacts their movement foundations. This limitation in physical activity is clinically evidenced by research from (Aubert et al., 2021), which confirms the impairment of children's body coordination and dynamic balance resulting from a sedentary lifestyle. Specifically within the institutional setting, this challenge is exacerbated by the dominance of conventional Physical Education (PJOK) instruction, which limits the scope for students' physical exploration, as reported by (Nugraha & Rahman, 2021). This teacher-centered approach dominated by theory and complex sports techniques consumes a significant portion of the time that should be spent on active movement. Consequently, this monotonous method fails to improve students' physical fitness while simultaneously fostering boredom and passivity during physical education classes. This aligns with the findings of (Andriyani, Kurniawan, & Lestari, 2022), who noted that the stagnation of such teaching methods directly hinders children's fitness and gross motor skills; by curtailing the optimal phase for neuromuscular training, these methods impede neural automatization and diminish students' physical and cognitive readiness for learning.

In reality, however, the fitness levels and motor capacities of primary school-aged children have experienced a worrying decline in the post-pandemic era. Evidence of this is found at SDN Soncoluka in Bima Regency, where a significant number of fourth-grade students exhibit substantial gross motor skill deficits during Physical Education (PE) lessons. These issues are manifested in low agility levels, poor dynamic eye-hand-foot coordination, and weak leg muscle explosive power during basic athletic activities. The root causes of this physical decline stem from two critical factors: excessive passive screen time outside of school, which fosters a sedentary lifestyle, and the use of conventional PE teaching methods that tend to be monotonous and lack interactive movement variety. If these motor deficits remain unaddressed during the critical "golden age" of development, students risk facing long-term physical growth impediments, low self-confidence, and reduced concentration in academic classroom learning.



Several previous studies indicate that traditional games can enhance the gross motor skills of elementary school students through physical activities involving coordination, balance, and agility such as the use of hopscotch games among junior high school students (Pratiwi et al., 2022). In addition, active play-based physical activities, such as tag games, also have a positive impact on the development of children's movement coordination and dynamic balance (Holfelder & Schott, 2020), which is supported by (Flaviani et al., 2023), stating that the structured physical activity involved in the game of "gobak sodor" is effective in optimizing leg muscle strength and body flexibility. Beyond physical aspects, the implementation of traditional game-based PE teaching methods has been shown to enhance active participation and learning motivation by fostering interpersonal competition that helps reduce anxiety levels (Setiawan & Wahyuni, 2023). Research by (Wibowo et al., 2025) also indicates that the enjoyment experienced by junior high school students during group games such as "bakiak" (traditional wooden clog racing) acts as a form of interactive neuromuscular stimulation that minimizes cognitive fatigue, thereby extending the duration of active movement.

However, a fundamental research gap across the aforementioned prior studies lies in the fact that their interventions focused predominantly on running agility (gobak sodor and tag games), single-leg balance (engklek), or walking gait synchronization (e.g., bakiak). Furthermore, this manuscript differs fundamentally from previous research in two key aspects: (1) the shift from conventional teaching methods to a structured, isolated plyometric jump-rope training program based on a unique Bima game played individually; and (2) the shift in target population from high school students to a homogeneous group of elementary school children (4th graders at SDN Soncoluka, Bima Regency) exhibiting significant motor deficits.

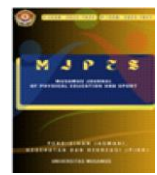
The urgency of this study stems from the pressing need to address gross motor skill deficits among primary school-aged children exacerbated by prolonged screen time in the digital era where early intervention during this critical "golden age" of development is vital to preventing neuromuscular coordination impairments and long-term cognitive decline. Amidst this urgency, the manuscript's primary novelty, relative to prior research, lies in two tactical aspects: (1) the transformation of conventional teaching methods into a structured, eight-week plyometric training program based on the traditional Bima jump-rope game known to the Mbojo community which is systematically organized into three progressive levels; and (2) a shift in subject focus from the high school populations that have dominated previous studies to a homogeneous group of primary school children (4th-grade students at SDN Soncoluka, Bima Regency) who are exhibiting tangible physical deficits. By integrating this novelty with the preservation of local culture, the manuscript makes a significant contribution by presenting empirically validated quantitative data that has been rigorously analyzed and clinically measured directly from the research site.

Based on the background and issues outlined, this study aims to empirically analyze the effectiveness of implementing the traditional game of jump rope in enhancing the gross motor skills of fourth-grade students at SDN Soncoluka. Specifically, the study seeks to measure the extent to which this local wisdom-based physical activity intervention stimulates positive changes in key motor indicators, including eye-hand-foot coordination, dynamic balance, agility, accuracy, and jumping rhythm.

Materials and Methods

Research Design

This study employs a quantitative approach using a quasi-experimental method. A one-group pretest-posttest design was implemented, wherein research subjects were



assessed via a formal test prior to the intervention (pre-test) and reassessed using the same instrument after the entire intervention program had concluded (post-test). The rationale for selecting this single-group quasi-experimental design is based on ethical considerations and practical field conditions. It was not feasible to randomly assign students into experimental and control groups (as in a true experiment). Doing so could potentially disrupt regular classroom instruction, create disparities regarding learning opportunities for students excluded from the intervention, and make it difficult to control social interactions among students outside of class hours given that they attend the same school.

Research Variables

To maintain an objective focus in measurement, this study limits and establishes two interrelated primary variables:

1. Independent Variable: Implementation of a progressively modified traditional jump-rope game intervention program (ranging from difficulty levels 1, 2, and 3).
2. Variabel Terikat (*Dependent Variable*): Keterampilan motorik kasar siswa, yang diukur secara spesifik melalui indikator daya ledak otot tungkai, kelincahan fisik, koordinasi dinamis mata-tangan-kaki, serta konsistensi ritme gerak tubuh.

Research Location

This study was conducted directly at SDN Soncoluka, Bima Regency. The selection of this location was based on identified issues regarding students' motor deficits during Physical Education (PJOK) lessons at the school. The entire process spanning initial data collection, the implementation of the training program, and final data collection took place over eight weeks during the even semester, specifically from June to July 2026.

Research Instrument

Students' gross motor skills are objectively measured through direct physical performance tests. This assessment combines two standardized instruments: Harold M. Barrow's Motor Skill Test used to measure basic physical capacities such as explosive power (standing broad jump), agility (zigzag run), and general coordination (medicine ball throw) and the Bruininks Oseretsky Test of Motor Proficiency (BOT), which evaluates specific neuromotor competencies. Through the actual movement tasks in the BOT, aspects such as dynamic balance, eye-hand-foot coordination, accuracy, and jumping rhythm can be assessed with validity and precision, and measured directly in a practical setting.

Research Procedure

The procedure for this study began with obtaining official authorization from the university, addressed to the Principal of SDN Soncoluka in Bima Regency. Once permission was secured, the researcher coordinated with the fourth-grade teacher to align activity schedules and provided a study information sheet outlining the objectives, procedures, and assurances regarding student safety. After confirming that the program could be integrated into the learning agenda without disrupting academic hours, the class teacher acting as the person in charge of daily operations provided formal approval by signing the informed consent form prior to the program's implementation.

Pre-intervention Stage (Pre-test)

Once administrative matters were concluded, the researcher defined the target population as all fourth-grade students. Sample selection was carried out using a purposive sampling technique based on adherence to strict criteria:

1. Inclusion Criteria: Registered as an active fourth-grade student in the even semester, physically able to participate in motor activities, and committed to full attendance.



2. Exclusion Criteria: Students with a history of underlying medical conditions (such as acute asthma or heart disorders), those currently recovering from a fracture or dislocation, or those absent during the initial data collection session.

Based on these criteria, a homogeneous sample of 30 students (20 male and 10 female) was selected. Initial data collection (pre-test) was conducted during the first week of June 2026. Students were instructed to perform a structured 10-minute warm-up. Subsequently, gross motor skills were assessed using two standard instruments: Harold M. Barrow's Motor Skill Test (comprising the standing long jump, shuttle run, and medicine ball throw) and the Bruininks-Oseretsky Test of Motor Proficiency (BOT) to measure coordination and movement rhythm. All raw scores were manually recorded by the data recording team on standardized assessment forms.

Intervention Implementation Stage (Treatment)

The intervention program, based on the traditional game of jump rope, was implemented using a single-group design without a control group because the entire sample (30 students) required the same motor rehabilitation. The program spanned eight weeks (effectively from June to July 2023), comprising a total of 24 sessions. Training was scheduled three times a week (Mondays, Wednesdays, and Saturdays) for 45 minutes per session (10 minutes of warm-up, 25 minutes of core jump-rope exercises, and 10 minutes of cool-down). The training program was led directly by the Physical Education teacher from SDN Soncoluka, who had been briefed on the training format by the researchers, while the research team served as independent field supervisors. The training content was designed with a progressive approach to prevent boredom and injury:

1. Weeks 1–2 (Level 1-Basic): Focus on single-jump techniques using individual rubber ropes to build basic rhythm and leg muscle strength.
2. Weeks 3–5 (Level 2 – Intermediate): Complexity is increased through varied locomotor movements, such as jumping while moving forward, backward, and sideways to train footwork agility.
3. Weeks 6–7 (Level 3– Advanced): Students face complex coordination challenges, such as performing double-under jump patterns and 180-degree mid-air turns, with varying rope rotation speeds.

To ensure treatment fidelity and program implementation, the researchers employed strict protocols: (1) student attendance was recorded at every session, with students absent more than twice automatically excluded from the final dataset; (2) equipment specifications (length and flexibility of the elastic bands) were standardized for all students; and (3) exercise intensity and volume were monitored using a standard stopwatch to ensure all students received an equal duration of movement.

Post-Intervention Stage (Post-test)

Upon completion of all 24 training sessions, the students were granted a full 48-hour rest period to recover physically from accumulated fatigue. Subsequently, a post-test was conducted to gather final data on the students' motor skills. To ensure internal validity and avoid measurement bias, the post-test procedure replicated the pre-test conditions exactly utilizing the same test instruments (Barrow Test and BOT Test), test sequence, data collection time (morning), school field location, and team of testing instructors.

Statistical Analysis

All test data were analyzed using descriptive statistics to calculate the mean, standard deviation, and percentage improvement in students' basic physical abilities (Barrow test) and neuromotor abilities (BOT test). Subsequently, a normality test was conducted using the Shapiro-Wilk method ($p > 0.05$), chosen for its sensitivity to small



sample sizes ($n = 30$). Comparative hypothesis testing to assess the significance of the treatment effect was performed using a Paired Sample t-Test at a significance level of $\alpha = 0.05$. The analysis concluded with the calculation of effect size using Cohen's d to determine the practical effectiveness and consistency of the impact of the progressive jump-rope training program (Levels 1–3). All analyses were conducted using SPSS software version 25.

Results

Descriptive Statistical Analysis Results

Gross motor skill assessment was conducted using direct physical performance tests administered as pre-tests and post-tests involving 30 fourth-grade students at SDN Soncoluka. A summary of descriptive data detailing student performance across each movement component is explicitly presented in Table 1 below:

Table 1. Results of the Descriptive Data Distribution for Students' Gross Motor Components

Movement Component/Test Item	Average Pretest	Average Posttest	Increase in Effectiveness (%)
Leg Muscle Strength (Standing Broad Jump)	115 cm	138 cm	20.00%
Agility (Zig-zag run)	14,2 second	11,8 second	17,00%
Coordination & Rhythm (BOT tets)	21,50	30,53	42,00%
Overall Score	75	81,73	30,98%

Based on Table 1, the descriptive analysis results indicate an improvement in physical performance across all tested gross motor components. Overall (in the aggregate), the students' mean gross motor skill score rose sharply from 62.40 at the pre-test stage to 81.73 at the post-test stage, representing a 30.98% improvement in movement ability. The most significant performance gain occurred in the coordination and rhythm component (BOT test), which recorded a 42.00% increase, followed by a 20.00% increase in leg muscle strength and a 17.00% improvement in agility time efficiency.

Normality Test Results

The normality test was conducted to determine whether the research data followed a normal distribution. The testing was performed Uji normalitas dilakukan untuk mengetahui apakah data penelitian berdistribusi normal atau tidak. Pengujian dilakukan menggunakan uji Shapiro-Wilk dengan taraf signifikansi 0,05, yang disajikan pada tabel 2.

Table 2. Shapiro-Wilk normality test results

Group	Shapirol-Wilk Statistik	df	Sig.
Pretest	0,951	30	0,241
Posttets	0,960	30	0,341

Based on the Shapiro-Wilk test results in Table 2, the significance values (p -values) obtained were 0.214 for the pre-test data and 0.341 for the post-test data. Since the significance values for both data groups consistently exceeded the required significance level ($\alpha = 0.05$) or ($p > 0.05$), the distribution of the students' gross motor skill data is considered normal. Thus, the prerequisite assumptions for parametric statistics have been fully met.

Hypothesis Test Results

To empirically demonstrate the effect of the traditional jump-rope game intervention on the improvement of students' gross motor skills, an inferential statistical analysis was conducted using a Paired Sample t-Test and an effect size test (Cohen's d). The results of the hypothesis testing are presented in Table 3 below:



Table 3. Paired Sample t-Test Results and Effect Size (Cohen's d)

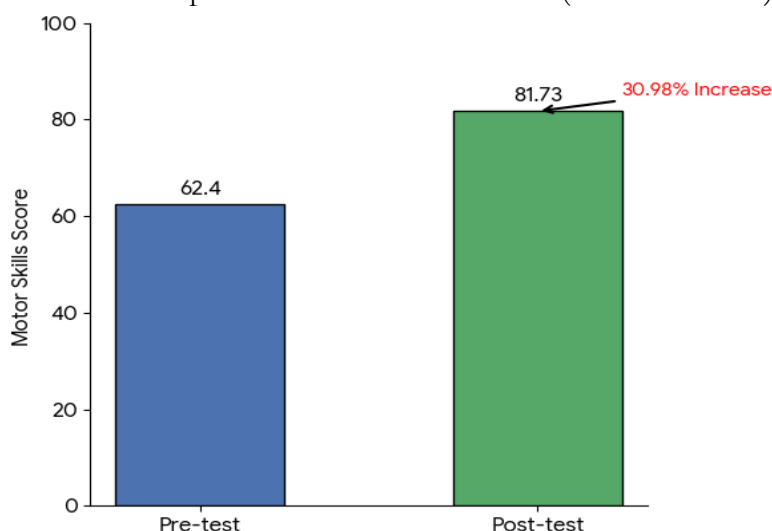
Group Test	Avarage (Mean)	Std.	Nilai t	P-Sig.	Effect Size (Cohen's d)
Pre-test	62,40	5,12	-14,23	< 0,001	1,87 (Very Large)
Post-test	81,73	4,85			

The results of the Paired Sample t-Test analysis in Table 3 show a calculated t-value of -14.23 with a significance level of $p < 0.001$. Since the obtained significance value is well below the testing threshold ($p < 0.05$), the null hypothesis (H_0) is formally rejected, and the working hypothesis (H_a) is accepted. These findings provide valid empirical evidence that the traditional jump-rope game program significantly improves the gross motor skills of students at SDN Soncoluka. Furthermore, the practical strength of this intervention is underscored by an Effect Size (Cohen's d) value of 1.87. Based on statistical criteria, a value exceeding 0.80 is classified as a "very large effect size." This demonstrates that the progressive training intervention (Levels 1–3) produced a massive, stable, and consistent physical impact across the entire sample of students.

Comparative Visualization of Gross Motor Skills

To conclude the results section and visually illustrate the trend of improvement in students' physical performance, a comparison of pre- and post-intervention aggregate scores is presented in the bar chart below:

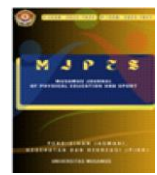
Grafik 1. Comparison of Motor Skills Score (Pretest-Posttest)



The bar chart above visually confirms the differences in students' gross motor skill achievement. The increase in the average score from 62.40 to 81.73 documents a shift in the fourth-grade students' gross motor competence toward a higher level of achievement following the completion of the intervention program. The structured implementation of the traditional jump rope game was proven to have a significant impact on improving the gross motor skills of fourth-grade students at SDN Soncoluka. Findings revealed a 30.98% increase in gross motor scores, supported by valid statistical results ($p < 0.001$) and a very large effect size (Cohen's $d = 1.87$), demonstrating the effectiveness of this progressive training program.

Discussion

The discussion begins by reaffirming the central novelty and the principal findings of this study. Unlike prior literature that generally examines traditional games or physical activity at a broad, macro level, this study specifically isolates the traditional jump rope game and evaluates it through a quantitative, dual-instrument approach combining Harold M. Barrow's Motor Skill Test and the Bruininks-Oseretsky Test of Motor Proficiency (BOT). The principal finding a rise in students' average motor skill score

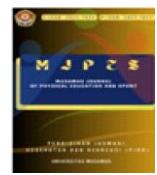


from 62.40 to 81.73, equivalent to a 30.98% improvement, accompanied by a statistically significant paired t-test result ($t = -14.23$, $p < 0.001$) and a very large effect size (Cohen's $d = 1.87$) provides robust empirical confirmation that a progressively structured, culturally rooted physical activity can produce measurable gains in children's gross motor competence. This finding is particularly relevant for physical education researchers and practitioners working in schools with limited facilities, as it demonstrates that meaningful neuromotor stimulation does not require costly equipment, but can instead be achieved through the systematic revitalization of local traditional games such as jump rope.

The effectiveness of this traditional game intervention is empirically demonstrated by the changes in children's physical performance outcomes between the initial and final evaluation phases. The difference in growth scores relative to the baseline confirms that external movement stimuli can measurably alter students' physical capacity. The rejection of the null hypothesis in the comparative analysis supported by a highly significant p-value indicates that these changes in movement competence resulted directly from the intervention, rather than from chance or natural growth. This conclusion is further reinforced by an effect size coefficient at the upper limit, demonstrating the program's high level of reliability in real-world application. The success of this intervention is mechanically driven by a jump-rope program designed to adapt from beginner to advanced levels. This intervention requires the simultaneous coordination of hands, feet, and eyes to optimally stimulate students' neuromotor competence (Ariyanto, 2020). The most significant impact is observed in dynamic coordination capacity and the mastery of jumping rhythm. This effect is driven by advanced rope-turning variations that compel the central nervous system to accelerate the children's visual reaction times. Furthermore, physical adaptations manifested as improved agility efficiency and an increased horizontal jumping range demonstrate a tangible enhancement in the students' leg muscle explosive power and motor agility.

The improvement of students' motor skills in this study was also influenced by the implementation of games structured in progressive stages, ranging from low to high levels of difficulty. At the initial level, students practiced synchronizing their body movements with the rotation of the rope at a slow pace, thereby helping to develop basic coordination and balance (Firdaus & Irfan, 2023). Subsequently, at higher levels, students were required to execute movements more rapidly and consistently, fostering the development of agility, precision, and rhythmic movement. These repetitive yet enjoyable learning activities encouraged students to participate more actively and enthusiastically in physical education lessons. This situation aligns with the view that (Bendriyanti & Haryono, 2021) which states that traditional games can provide effective movement stimulation because they directly involve locomotor and coordinative activities within a fun learning environment.

When situated within the broader body of literature, the findings of this study are consistent with a growing consensus that traditional, game-based physical activities meaningfully enhance children's motor development. (Fauzi et al., 2023) similarly reported that traditional games improve gross motor skills among elementary school students through structured activities involving coordination, balance, and agility, while (Hammia & Kenioua, 2026) demonstrated a positive relationship between game-based physical activity and the development of children's fundamental movement coordination. In a related vein, (Mardiansyah et al., 2024) found that traditional games increase students' active participation and motivation during physical education (Sunanto et al., 2024) confirmed that a traditional-games approach can improve locomotor movement skills among elementary school students. Taken together, these prior studies corroborate the present findings and reinforce the position that traditional games, including jump



rope, represent an effective and culturally grounded pedagogical tool for motor skill development

The results of this study align with research by (Shodiq et al., 2025), which indicates that integrating traditional games into physical education instruction can significantly enhance the gross motor skills of elementary school students. That study explains that traditional game activities provide more active movement experiences compared to conventional instruction, thereby optimizing students' motor development. Furthermore, research by (Arifin et al., 2025) demonstrates that traditional games are effective in improving students' motor abilities, as they involve continuous running, jumping, and maintaining body balance throughout the game.

These research findings are further supported by an international study conducted by (Saputra et al., 2021) which indicates that traditional games positively influence the fundamental movement skills of elementary school students particularly regarding running, jumping, and body coordination. Game-based activities involving repetitive fundamental movements foster the development of students' motor skills more effectively than conventional teaching methods. Other research on jump rope activities also demonstrates that such exercises can enhance students' locomotor abilities, body coordination, and leg muscle strength through structured, repetitive movement (Choerunisa, 2026). These findings are reinforced by findings from (Firdaus et al., 2026) Structured physical activity whether traditional games or formal sports training yields positive physiological effects on children and adolescents, taking into account the local tropical climate conditions, such as those in Bima.

The convergence between the present results and those of the studies discussed above can likely be attributed to a shared underlying mechanism: repetitive, whole-body locomotor engagement that simultaneously activates multiple biomotor components such as balance, coordination, and explosive power, regardless of the specific traditional game employed. However, some notable differences also emerge. Compared to earlier studies that generally relied on a single generic motor-ability test or observational rating scale, the present study applied a dual standardized instrument (the Barrow test and the BOT), which likely accounts for the comparatively larger effect size (Cohen's $d = 1.87$) obtained here relative to the effect sizes commonly reported in the broader traditional-games literature. Differences in population characteristics and context may also play a role; unlike studies conducted across multiple schools or heterogeneous age groups, this study focused on a single, homogeneous cohort of 30 fourth-grade students at one rural school, which may have reduced extraneous variability and produced a more consistent, concentrated treatment effect. Methodological differences, such as the progressive three-level (basic-intermediate-advanced) structure of the intervention used in this study compared to the single-format game protocols used in some prior research, may further explain the magnitude of improvement observed, particularly in the coordination and rhythm component.

In addition to enhancing motor skills, the implementation of the traditional jump rope game positively impacts student engagement during physical education lessons. Students appear more active, enthusiastic, and motivated to participate because the game takes place in a fun and competitive atmosphere. This is consistent with the findings (Firdaus et al., 2025) emphasized activities involving cooperation, challenges, and varied movements make it easier for students to grasp the mechanics and encourage them to attempt the jumps repeatedly. These findings align with research (Kristina et al., 2025) indicating that traditional games in physical education can boost active participation and student learning motivation. Thus, the traditional jump rope game serves as an effective and simple alternative instructional model well-suited to the characteristics of elementary school students for optimally enhancing motor skills.



Beyond confirming prior findings, this study contributes a distinct novelty to the field of sports science and physical education. First, it offers one of the few quantitative, experimentally structured examinations of the traditional jump rope game specifically, rather than treating traditional games as an undifferentiated category, thereby narrowing the gap in the literature noted in the Introduction. Second, the study introduces a replicable, three-level progressive training design (basic, intermediate, and advanced) that can serve as a methodological template for future traditional-game-based interventions. Third, by combining Harold M. Barrow's Motor Skill Test with the Bruininks-Oseretsky Test of Motor Proficiency, this study demonstrates a more comprehensive and multidimensional evaluation strategy capturing explosive power, agility, and neuromotor coordination and rhythm simultaneously that future researchers investigating traditional physical activities can adopt. Collectively, these contributions extend the theoretical and methodological foundation for integrating local cultural wisdom into evidence-based physical education practice.

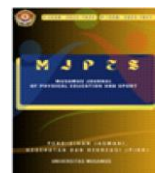
The practical implications of these findings offer a tactical contribution in the form of an evidence-based, low-cost, progressive jump-rope curriculum blueprint (Levels 1–3). This curriculum can be immediately adopted by physical education teachers at SDN Soncoluka and similar schools in Bima Regency to overcome the lack of modern sports facilities by leveraging local wisdom. Regarding future research directions, the study's methodology should be upgraded to a true experimental design incorporating an active control group to enhance internal validity. Furthermore, future research is advised to broaden the scope of evaluation to include children's physiological variables such as cardiorespiratory capacity (VO₂max) measured via the Multi-stage Fitness Test (MFT) and to diversify subject characteristics regarding demographics, age ranges, and gender-based comparative analysis, thereby strengthening external validity and the holistic generalizability of the findings.

From an academic and policy standpoint, these findings support the argument that primary-school curriculum policy should more deliberately accommodate culturally based physical activities as a legitimate and evidence-supported strategy for addressing children's motor deficiencies, rather than treating such activities as merely supplementary or recreational. For academic purposes, the study also provides a validated framework combining standardized dual-instrument assessment with a staged intervention design that can inform future theory-building on how structured traditional play contributes to fundamental movement skill acquisition. Policymakers and school administrators in resource-limited regions, particularly those similar to Bima Regency, may consider formally incorporating structured traditional-game programs, such as the jump-rope curriculum proposed here, into local physical education guidelines as a low-cost strategy to counteract the effects of sedentary, digital-device-dominated lifestyles among children.

Despite yielding significant results, this study has limitations due to its use of a one-group pretest-posttest quasi-experimental design without a control group. This setup restricts internal validity regarding the isolation of confounding variables external to the training program such as the students' daily physical activity outside of school hours. Furthermore, the scope of the study subjects was limited to 30 fourth-grade students at a single school; consequently, generalizing the findings to a broader or more heterogeneous population of primary school-aged children requires caution.

Conclusions

Overall, the traditional game intervention proved effective in optimizing the gross motor capabilities of elementary school-aged children. Concrete evidence of this success is demonstrated by improvements across all physical indicators, including enhanced leg muscle explosive power, greater agility (reduced completion time), and significant



progress in dynamic coordination and movement rhythm. However, the study is subject to limitations: a small sample size; a geographic scope confined to a single school in Bima Regency, which restricts the generalizability of the findings; and the use of a single-group design without an active control, which limits internal validity regarding the isolation of extraneous variables. Given these findings and limitations, future research should adopt a true experimental design utilizing a randomized control group to strengthen statistical analysis. Future researchers are also advised to expand sample representation across multiple schools, diversify subject characteristics regarding gender, and enrich testing methods by comprehensively measuring internal physiological variables, such as cardiopulmonary functional capacity (VO_2Max).

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Conflict of Interest

No conflict of interest

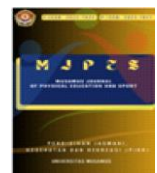
Funding

State the source of funding or write:

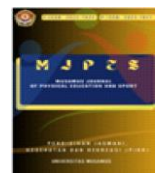
“This research received no external funding.”

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