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Traditional Games and Motor Ability: Their Interaction in Enhancing Long Jump Performance in Elementary School Students

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Abstract: *The development of motor skills during childhood plays a crucial role in overall physical fitness and athletic performance. Traditional games, which hold cultural significance, serve as an effective method for enhancing these skills. This study aimed to investigate the comparative effects of two traditional games Engklek and Lompat Tali on the long jump performance of elementary school students, while considering different levels of motor ability. Specifically, it examined whether traditional game interventions could enhance motor skills (agility, coordination, explosive power, and speed) and translate into improved long jump outcomes. A factorial experimental design (2 × 2) was employed with a sample of 24 male students, aged 10–11 years, selected through purposive sampling. The participants were divided into two groups based on the traditional game intervention (Engklek or Lompat Tali) and further classified by motor ability levels (high or low). Motor skills were assessed using standardized tests measuring agility, coordination, explosive power, and speed. Long jump performance was evaluated based on four components: take-off, push, flight, and landing. Data analysis included normality and homogeneity tests, followed by a two-way ANOVA using SPSS version 23, with a significance level of $p < 0.05$. The results indicate significant differences in long jump performance between students who participated in Engklek and those in Lompat Tali. Furthermore, a significant interaction effect was found between traditional games and motor ability levels. Students with high motor ability showed greater improvements in long jump skills compared to those with low motor ability, with variations observed between the two traditional game groups. These findings highlight the potential of integrating traditional games into physical education as a culturally relevant and engaging approach to improving motor skills and athletic performance. Further research is recommended to explore the long-term benefits of traditional games in broader sports training contexts.*

Keywords: *traditional games, motor ability, long jump, physical education, athletic performance*

Introduction

Physical education is an essential element of the educational curriculum (Burhaein et al., 2020), significantly contributing to the comprehensive development of pupils. It promotes physical health as well as cognitive and social abilities, therefore enhancing the overall well-being of youngsters (Harvey et al., 2018). Traditional games, deeply embedded in cultural heritage, provide a distinctive amalgamation of physical engagement and cultural education (Ashar et al., 2024; Shimray, 2024). These games have been acknowledged for their beneficial effects on diverse motor skills, including agility, coordination, explosive strength, and velocity—skills crucial for athletic success (Zubaida et al., 2021).

The cultivation of motor skills from childhood is essential, as these abilities establish the groundwork for more intricate motions necessary in sports and physical endeavors (Adolph & Hoch, 2020; Dapp et al., 2021). Proficient early development of motor skills can yield enduring advantages, including superior physical health, augmented academic achievement, and enhanced social connections (Bremer & Cairney, 2016). Traditional games, emphasizing physical exercise, coordination, and muscle development, provide an efficient method for cultivating these vital skills. Furthermore, they have demonstrated efficacy in alleviating stress, enhancing focus, and fostering overall pleasure and well-being (Hussain & Cheong, 2022; Ismoyo et al., 2024).

This research examines the impact of two traditional games—Engklek and Lompat Tali—on the long jump proficiency of children at Elementary School SD Islam terpadu Siti Hajar . Engklek, similar to hopscotch, entails hopping on one foot across a sequence of squares marked on the ground, fostering balance, coordination, and agility. Lompat Tali, or rope jumping, involves pupils leaping over a moving rope, thereby improving explosive strength, velocity, and coordination (Mahardika, 2014).

Prior studies have established the advantages of traditional games in improving motor abilities, including agility, coordination, explosive strength, and velocity. Zubaida et al. (2021) discovered that traditional games markedly enhanced aerobic capacity and agility in children. Likewise, Mahardika (2014) indicated that these games enhanced physical fitness and promoted social behaviors in early childhood. Such studies underscore the capacity of traditional games to cultivate fundamental motor abilities, which are critical for athletic performance.

Motor skills such as agility, coordination, explosive strength, and velocity are essential determinants of performance in various sports, including the long jump. Agility, characterized as the capacity to alter direction swiftly and precisely (Fiorilli et al., 2017), is essential in numerous conventional activities. In Engklek, participants must synchronize and balance their motions while hopping on one foot through the squares, hence enhancing their agility and coordination (Rizki et al., 2022). Lompat Tali necessitates players to synchronize their jumps with a swinging rope, hence improving explosive strength and speed (Nurfitriyana, 2022).

Explosive power, is defined as the ability to produce maximum force in a brief duration (Huang et al., 2023), is crucial for the take-off phase of the long jump. Conventional games such as Lompat Tali improve this ability by requiring swift, elevated hops that replicate the explosive movement essential for an effective long jump (Gescheit et al., 2015). Likewise, speed, crucial for generating momentum during the approach in the long jump, is enhanced by traditional sports that necessitate rapid and dynamic movements (Arianda et al., 2021; Rhodes et al., 2020).

While the advantages of traditional games in enhancing motor skills are well recognized, there exists a paucity of research directly investigating their influence on long jump performance. Most studies emphasize the overall advantages of these games in enhancing health and social skills, rather than their impact on particular physical competencies like the long jump. This study seeks to address this gap by investigating the impact of Engklek and Lompat Tali on long jump performance. This research will yield significant insights on the efficacy of traditional games as a means to improve athletic performance, especially in the long jump.

Traditional games significantly contribute to the preservation of cultural heritage, establish a connection to history, and cultivate a sense of community among participants (Abdel-Maksoud et al., 2021). Integrating these games into physical education curricula enables schools to foster physical fitness while simultaneously cultivating an appreciation for cultural diversity and heritage among students.

This study investigates the efficacy of traditional games, specifically Engklek and Lompat Tali, in augmenting motor skills and enhancing long jump ability in primary school students. The findings seek to guide the design of physical education programs, emphasizing the necessity of integrating enjoyable, culturally pertinent activities to enhance motor development and athletic performance.

Method

Research Design

This research employed a comparative design (Creswell, 2014), to assess the influence of traditional games on the long jump performance of students at Elementary School SD Islam terpadu Siti Hajar . The main aim was to investigate the impact of various traditional games, particularly Engklek and Lompat Tali, on the enhancement of motor skills and long jump proficiency.

Participants

The research comprised 24 male students, aged 10–11 years, from Elementary School SD Islam Terpadu Siti Hajar, selected using a purposive sampling method. The participants were randomly allocated to one of two groups: the Engklek group or the Lompat Tali group, each consisting of 12 students. The random assignment guaranteed that the groups were equivalent in age and initial physical capabilities, thereby preserving the integrity of the comparative design (Creswell & Creswell, 2018).

Intervention

The strategy was to integrate traditional games into the physical education curriculum. The Engklek group engaged in the game of Engklek, which necessitates players to hop on one foot across a sequence of squares marked on the ground. This game aims to enhance balance, coordination, and agility. Simultaneously, the Lompat Tali group participated in rope jumping, an activity that entails leaping over a swinging rope. This activity aims to improve explosive strength, velocity, and coordination. The intervention occurred over four weeks, with sessions conducted four times weekly. Each session lasted 40 minutes, consistent with the school's physical education class duration.

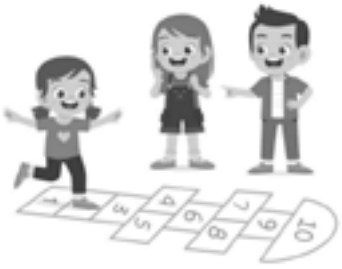

Figure 1. *Ilustration of Engklek*

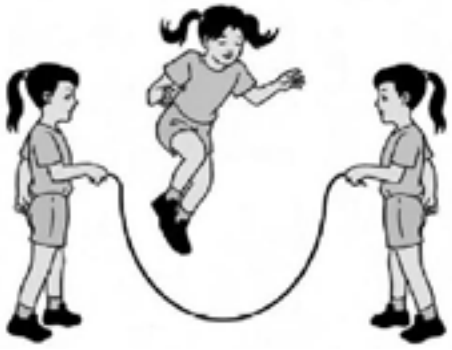

Figure 2. *Ilustration of Lompat Tali*

Instrument

This study utilized standardized assessments to evaluate diverse motor skills, including agility, coordination, explosive power, and speed. The evaluation of long jump performance was based on four essential components: approach run technique, take-off technique, flight phase technique, and landing technique. Data were gathered by direct observation and established testing protocols to guarantee consistency and precision in documenting the participant's performances.

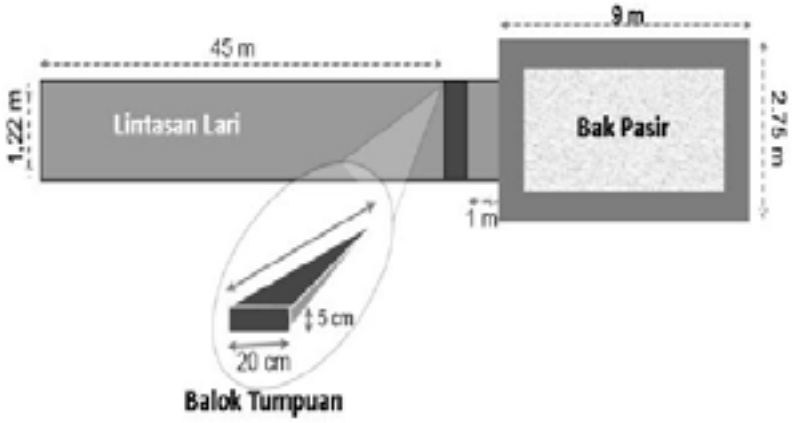

Figure 3. *Long Jump Test Arena*

Notes:

- **Lintasan Lari:** Running track.
- **Balok Tumpuan:** Bearing beam.
- **Bak Pasir:** Sandbox.

The subsequent table delineates the comprehensive assessment criteria for evaluating long jump proficiency, segmented into four principal phases: the approach run (prefix), take-off (push), flight (float), and landing. Each phase is further divided into specific sub-indicators that evaluate the techniques necessary for attaining optimal performance in the long jump.

Table 1. *Long Jump Skill Test Instrument*

Indicators		Sub Indicators		Assessments
1	Prefix (approach run technique)	a	Foot Position: One foot should be placed in front, with hands relaxed beside the body, and eyes looking straight ahead.	
		b	Center of Gravity: Maintain the center of gravity while running.	
		c	Coordination: Ensure the coordination of arm swings and footsteps in rhythm.	
		d	Final Step: During the last step, coordinate vision by aligning eye movement with foot movement.	
		e	Push Accuracy: Ensure the accuracy of the pushing foot on the springboard.	
2	Push (take-off technique)	a	Supporting Foot: One end of the foot becomes the supporting foot to execute a quick and strong push.	
		b	Body Position: The body leans slightly forward.	
		c	Push Angle: The push angle when supporting is 45 degrees.	
		d	Movement: Form a horizontal movement when pushing.	
		e	Arm Swing: When pushing, it is assisted by swinging the arms upwards.	
3	Float (flight phase technique)	a	Body Balance: Maintain body balance in the air to achieve a parabolic movement.	
		b	Leg and Arm Swing: Swing the legs and arms when taking off in the air.	
		c	Floating Position: Extend the torso and both legs as far as possible to achieve a floating position.	
		d	Legs and Hands: Keep the legs straight forward with hands.	
		e	Landing Approach: Relax and bend the legs when approaching the landing.	
4	Land (landing technique)	a	Feet Position: Keep feet relaxed when touching the sand.	
		b	Leg Position: Maintain a bent leg position when landing, with the soles of the feet touching the sand.	
		c	Body Position: Adopt a squatting body position.	
		d	Hand Position: Position hands forward to prevent the body from falling backward.	
		e	Body Balance: Ensure body balance is maintained in front.	

The following table lists the motor skill test instruments that were employed to evaluate the physical abilities of the participants, such as agility, coordination, explosive power, and speed. The purpose of these tests was to assess the participant's proficiency in critical motor skills that are essential for athletic performance.

Table 2. *Motor Skill Test Instrument*

No	Indicators	Assessments
1	Agility	Shuttle-run 4 x 10 m
2	Coordination	Throw and catch the ball 1 m away against the wall
3	Explosive power	Vertical jump
4	Speed	30 m run

Data Analysis

The gathered data were examined utilizing statistical software (SPSS version 23). Homogeneity and normality tests were first performed using the Kolmogorov-Smirnov Z test to evaluate the data's appropriateness for parametric analysis. After satisfying the requirements of homogeneity and normality, a one-way ANOVA was conducted to examine significant differences between the two groups. A significance level of $p < 0.05$ was established to ascertain statistically significant differences in long jump performance between the Engklek and Lompat Tali groups (Gescheit

et al., 2015). This comprehensive investigation delivered a strong assessment of the influence of traditional games on long jump performance, presenting significant insights into their potential to improve physical education curricula.

Result

List of Participants

Table 3 includes the initials of students who participated in two different groups: the Engklek group and the Lompat tali group. Each group consists of 12 students.

Table 3. *Initial Group Assignments of Participants*

No	Engklek (Initial)	Lompat tali (Initial)
1	AA	AL
2	AB	AM
3	MFL	AI
4	MAS	FM
5	LP	F SF
6	JIP	MS
7	MAIR	MZL
8	MS	QRD
9	M. F R	RSD
10	FAL	RS
11	DBP	SB
12	RWR	ZJ

Student's Agility Test Result

Table 4 displays the agility test results for students in the Engklek group. Each student is identified by their initials, and their performance is assessed across three trials. The average time (in seconds) for each student is calculated, along with the t-score, which indicates the statistical significance of their performance. The mean times for each student range from 11.78 seconds to 14.06 seconds, indicating varying levels of agility among them. The t-scores offer additional insight into the consistency and reliability of their performance.

Table 4. *Data on Agility of Engklek Group Students*

No	Initial	Tester			Mean (sec)	t-score
		1 (sec)	2 (sec)	3 (sec)		
1	AA	12.34	12.09	12.97	12.47	53.68
2	AB	14.15	13.91	14.11	14.06	30.46
3	MFL	12.93	12.98	12.74	12.88	47.60
4	MAS	12.64	11.82	12.36	12.27	56.51
5	LP	11.89	12.13	12.55	12.19	57.72
6	JIP	13.06	13.27	13.12	13.15	43.70
7	MAIR	11.48	12.32	11.55	11.78	63.66
8	MS	13.52	13.19	13.78	13.50	38.64
9	M. F R	12.76	13.05	13.45	13.09	44.63
10	FAL	14.31	13.98	13.71	14.00	31.28
11	DBP	13.5	13.74	14.03	13.76	34.84
12	RWR	12.84	13.17	12.95	12.99	46.09
Mean		12.95	12.97	13.11	13.01	-

Table 5 presents the agility test results for students in the Lompat tali group. Each student is identified by their initials, and their performance is measured across three trials.

Table 5. *Data on Agility of Lompat Tali Group Students*

No	Initial	Tester			Mean (sec)	t-score
		1 (sec)	2 (sec)	3 (sec)		
1	AL	12.16	12.77	12.34	12.42	54.32
2	AM	11.97	12.10	12.34	12.14	58.50
3	AI	13.04	12.93	13.01	12.99	45.99
4	FM	12.81	12.64	12.79	12.75	49.59
5	F SF	11.16	11.47	12.04	11.56	66.98
6	MS	11.70	11.85	11.63	11.73	64.49
7	MZL	12.51	12.35	12.08	12.31	55.92
8	QRD	11.97	12.07	12.19	12.08	59.38
9	RSD	13.15	12.84	12.94	12.98	46.23
10	RS	12.80	11.75	12.19	12.25	56.90
11	SB	13.23	13.01	12.81	13.02	45.65
12	ZJ	12.87	12.73	13.12	12.91	47.25
Mean		12.45	12.38	12.46	12.43	-

The mean time (in seconds) for each student is calculated, along with the t-score, which indicates the statistical significance of their performance. The mean times for the students range from 11.56 seconds to 13.02 seconds, reflecting varying levels of agility among them. The t-scores provide further insight into the consistency and reliability of their performances.

Student's Coordination Test Result

Table 6 shows the coordination test results for students in the Engklek group. Each student is identified by their initials, and their performance is measured across three trials. The mean time (in seconds) for each student is calculated, along with the t-score, which indicates the statistical significance of their performance. The mean times for each student range from 7.67 seconds to 11.33 seconds, reflecting different levels of coordination among the students. The t-scores provide further insight into the consistency and reliability of their performances.

Table 6. *Data on Coordination of Engklek Group Students*

No	Initial	Tester			Mean	t-score
		1	2	3		
1	AA	10	9	9	9.33	44.50
2	AB	7	8	8	7.67	36.84
3	MFL	10	8	9	9.00	42.97
4	MAS	10	10	9	9.67	46.04
5	LP	11	10	10	10.33	49.11
6	JIP	10	8	9	9.00	42.97
7	MAIR	12	11	11	11.33	53.71
8	MS	9	10	9	9.33	44.50
9	M. F R	10	9	10	9.67	46.04
10	FAL	8	7	8	7.67	36.84
11	DBP	10	8	9	9.00	42.97
12	RWR	9	11	10	10.00	47.57
Mean		9.7	9.1	9.3	9.3	-

Table 7 presents the coordination test results for students in the Lompat tali group. Each student is identified by their initials, and their performance is measured across three trials. We calculated the mean time (in seconds) for each student and the t-score, which indicates the statistical significance of their performance. The mean times for the students range from 7.33 seconds to 15.33 seconds, reflecting varying levels of coordination. The t-scores offer additional insight into the consistency and reliability of their performance.

Table 7. *Data on Coordination of Lompat Tali Group Students*

No	Initial	Tester			Mean	t-score
		1	2	3		
1	AL	11	12	12	11.67	55.24
2	AM	13	13	12	12.67	59.84
3	AI	9	8	7	8.00	38.37
4	FM	14	12	11	12.33	58.31
5	F SF	15	16	15	15.33	72.11
6	MS	13	15	15	14.33	67.51
7	MZL	12	12	10	11.33	53.71
8	QRD	11	13	12	12.00	56.77
9	RSD	8	7	7	7.33	35.30
10	RS	13	12	12	12.33	58.31
11	SB	14	14	13	13.67	64.44
12	ZJ	11	10	8	9.67	46.04
Mean		12	12	11.17	11.72	-

Student's Explosive Power Test Result

Table 8 presents the explosive power test results for students in the Engklek group. Each student is identified by their initials, and their performance is measured in terms of reach and jump heights. The difference between the reach and jump heights is calculated, along with the t-score, which indicates the statistical significance of their performance. The mean reach height for the students is 129.08 cm, and the mean jump height is 144.25 cm, resulting in an average difference of 15.17 cm. The t-scores provide additional insight into the consistency and reliability of their performance.

Table 8. *Data on the Explosive Power of Engklek Group Students*

No	Initial	Reach (cm)	Jump (cm)	Difference (cm)	t-score
1	AA	125	140	15	43.83
2	AB	132	143	11	31.97
3	MFL	127	142	15	43.83
4	MAS	130	145	15	43.83
5	LP	133	150	17	49.75
6	JIP	128	144	16	46.79
7	MAIR	128	147	19	55.68
8	MS	127	142	15	43.83
9	M. F R	131	147	16	46.79
10	FAL	127	139	12	34.93
11	DBP	130	145	15	43.83
12	RWR	131	147	16	46.79
Mean		129.08	144.25	15.17	-

Table 9 displays the results of the explosive power test for students in the Lompat tali group. Each student is identified by their initials, and their performance is measured in terms of reach and jump heights. The difference between the reach and jump heights is calculated, along with the t-score, which indicates the statistical significance of their performance. The average reach height for the students is 127.67 cm, while the mean jump height is 146.67 cm, resulting in an average difference of 19.00 cm. The t-scores provide further insight into the consistency and reliability of their performance.

Table 9. *Data on the Explosive Power of Lompat Tali Group Students*

No	Initial	Reach (cm)	Jump (cm)	Difference (cm)	t-score
1	AL	129	148	19	55.68
2	AM	126	147	21	61.61
3	AI	130	144	14	40.86
4	FM	127	146	19	55.68
5	F SF	131	155	24	70.50
6	MS	128	151	23	67.54
7	MZL	125	143	18	52.72
8	QRD	127	146	19	55.68
9	RSD	124	137	13	37.90
10	RS	127	147	20	58.64
11	SB	130	152	22	64.57
12	ZJ	128	144	16	46.79
Mean		127.67	146.67	19.00	-

Student's Speed Test Result

Table 10 presents the speed test results for students in the Engklek group. Each student is identified by their initials, and their performance is measured across three trials. The mean time (in seconds) for each student is calculated, along with the t-score, which indicates the statistical significance of their performance.

Table 10. *Data on Speed of Engklek Group Students*

No	Initial	Tester			Mean	t-score
		1	2	3		
1	AA	8.05	7.65	8.13	7.94	39.59
2	AB	7.72	8.64	7.95	8.10	36.47
3	MFL	8.19	7.92	7.68	7.93	39.85
4	MAS	7.63	8.06	7.75	7.81	42.12
5	LP	8.16	7.24	6.09	7.16	54.76
6	JIP	7.21	7.38	7.63	7.41	50.03
7	MAIR	6.65	7.07	6.85	6.86	60.73
8	MS	7.58	7.73	7.81	7.71	44.19
9	M. F R	7.31	7.55	7.61	7.49	48.41
10	FAL	8.35	8.02	7.73	8.03	37.84
11	DBP	7.83	7.55	8.04	7.81	42.25
12	RWR	7.59	7.31	7.55	7.48	48.54
Mean		7.69	7.68	7.57	7.64	-

The mean times for the students range from 6.86 seconds to 8.10 seconds, reflecting varying levels of speed among them. The t-scores offer further insight into the consistency and reliability of their performance.

Table 11 summarizes the speed test results for students in the Lompat tali group. Each student is identified by their initials, and their performance is assessed across three trials. The mean time (in seconds) for each student is calculated, providing an overview of their speed performance. The mean times for each student range from 6.32 seconds to 8.00 seconds, reflecting varying levels of speed among the students. The corresponding t-scores provide additional insight into the consistency and reliability of their performance, with higher scores indicating more significant statistical differences in performance. This data highlights the impact of the Lompat tali activity on the student's speed capabilities, underlining the importance of such exercises in physical education programs.

Table 11. *Data on Speed of Lompat Tali Group Students*

No	Initial	Tester			Mean	t-score
		1	2	3		
1	AL	6.94	7.35	7.72	7.34	51.39
2	AM	7.12	7.62	7.49	7.41	49.96
3	AI	7.18	7.25	7.61	7.35	51.20
4	FM	7.05	7.78	7.65	7.49	48.34
5	F SF	6.67	6.01	6.38	6.35	70.52
6	MS	5.94	6.18	7.02	6.38	70.01
7	MZL	6.38	7.05	6.37	6.60	65.73
8	QRD	6.15	6.84	7.09	6.69	63.91
9	RSD	7.14	7.91	8.13	7.73	43.80
10	RS	6.92	7.25	7.60	7.26	52.95
11	SB	7.26	6.95	8.11	7.44	49.38
12	ZJ	8.03	7.81	8.23	8.02	38.03
Mean		6.90	7.17	7.45	7.17	-

Student's Long Jump Skill Test Result

Table 12 displays the results of the long jump skills test for students in the Engklek group. Each student is identified by their initials, and their performance is measured over three trials. The mean distance (in centimeters) for each student is calculated, along with the t-score, which indicates the statistical significance of their performance. The mean distances range from 69.67 cm to 87.00 cm, reflecting differing levels of long jump skills among the students. The t-scores offer further insight into the consistency and reliability of their performances.

Table 12. *Long Jump Skills Data of Engklek Group Students*

No	Initial	Tester			Mean	t-score
		1	2	3		
1	AA	74	77	77	76.00	44.57
2	AB	69	70	70	69.67	33.89
3	MFL	73	74	74	73.67	40.64
4	MAS	76	78	78	77.33	46.82
5	LP	77	79	79	78.33	48.50
6	JIP	83	82	82	82.33	55.24
7	MAIR	87	88	86	87.00	63.11
8	MS	75	79	76	76.67	45.69
9	M. F R	79	78	78	78.33	48.50
10	FAL	72	70	69	70.33	35.02
11	DBP	75	75	76	75.33	43.44
12	RWR	76	78	77	77.00	46.25
Mean		76.33	77.33	76.83	76.83	-

Table 13 presents the long jump skill test results for students in the Lompat tali group. Each student is identified by their initials, and their performance is measured across three trials. The mean distance (in centimeters) for each student is calculated, along with the t-score, which indicates the statistical significance of their performance. The mean distances for each student range from 73.00 cm to 90.33 cm, reflecting varying levels of long jump skills among the students. Additionally, the t-scores offer further insight into the consistency and reliability of their performance.

Table 13. *Long Jump Skills Data of Lompat Tali Group Students*

No	Initial	Tester			Mean	t-score
		1	2	3		
1	AL	83	83	80	82.00	54.68
2	AM	85	85	83	84.33	58.62
3	AI	73	74	72	73.00	39.51
4	FM	77	77	76	76.67	45.69
5	F SF	92	89	90	90.33	68.73
6	MS	89	88	88	88.33	65.36
7	MZL	84	85	83	84.00	58.05
8	QRD	87	88	89	88.00	64.80
9	RSD	74	76	73	74.33	41.76
10	RS	86	86	89	87.00	63.11
11	SB	74	76	75	75.00	42.88
12	ZJ	76	75	78	76.33	45.13
Mean		81.67	81.83	81.33	81.61	-

Table 14. *Summary of ANOVA Results for Long Jump Performance*

Source	SS	df	MS	F	p
Traditional games	152.34	1	152.34	5.72	0.025*
Motor ability levels	198.67	1	198.67	7.46	0.012*
Interaction (Game × Motor Ability)	174.90	1	174.90	6.56	0.017*
Error	556.40	20	27.82		
Total	1082.31	23			

$*p < 0.05$

The ANOVA revealed significant main effects of both traditional game type and motor ability level, as well as a significant interaction between the two factors. Students in the Lompat Tali group outperformed those in the Engklek group, and students with higher motor ability showed greater improvements compared to those with lower motor ability.

Discussion

The ANOVA results (Table 14) confirm that the type of traditional game and motor ability level significantly affected long jump performance. Moreover, the significant interaction indicates that the benefits of Lompat Tali were more pronounced for students with high motor ability. These findings validate the hypothesis that traditional games can differentially enhance athletic performance depending on the nature of the activity and the initial motor ability of participants.

The data obtained from the Engklek and Lompat Tali groups offers significant insights into the influence of these traditional games on student's physical capabilities, particularly regarding agility, coordination, explosive strength, speed, and long jump performance. The results reveal substantial disparities between the two groups in these essential

motor skills, enhancing comprehension of how each activity fosters the development of physical talents.

The agility results reveal that the Engklek and Lompat Tali groups exhibit varying levels of agility. The Engklek group had average timings between 11.78 to 14.06 seconds, but the Lompat Tali group demonstrated a marginally shorter range of 11.56 to 13.02 seconds. The findings indicate that Lompat Tali, which includes plyometric exercises, may be superior in enhancing agility relative to Engklek. Prior studies substantiate this idea, indicating that plyometric workouts, including jump rope, markedly improve agility by enhancing neuromuscular responsiveness and speed (Woodard & Chen, 2024). These findings emphasize the necessity of integrating dynamic, plyometric exercises into physical education curricula to improve agility.

The Engklek group exhibited a more uniform performance in coordination, with mean times between 7.67 and 11.33 seconds, whereas the Lompat Tali group displayed a wider range of 7.33 to 15.33 seconds. Despite the variability in the Lompat Tali group, both groups demonstrated elevated levels of coordination. However, the consistent performance of the Engklek group may indicate that Engklek is particularly effective in enhancing coordination. This is consistent with existing research highlighting the significance of proprioceptive training—such as that involved in Engklek—in improving coordination. Proprioception is crucial for motor control, as it provides the sensory feedback necessary to regulate muscle activity and enhance motor function (Iorga et al., 2023; Pramanick et al., 2022). These findings imply that Engklek may be particularly advantageous for developing student's motor coordination.

The examination of explosive power indicates that the Lompat Tali group had superior enhancements in jump height, with mean differences between 13 cm and 24 cm, in contrast to the Engklek group's range of 11 cm to 19 cm. This indicates that Lompat Tali, with its focus on vertical and horizontal jumps, is superior in augmenting explosive force. Studies have consistently demonstrated that plyometric exercises, such as jump rope activities, result in substantial enhancements in explosive power (Anggoro & Masrun, 2023; Wang et al., 2023). These exercises activate the stretch-shortening cycle of the muscles, essential for cultivating the explosive strength required for athletic endeavors like the long jump (Makaruk et al., 2020; Ramirez-Campillo et al., 2020).

The Lompat Tali group had marginally superior speed, with average times between 6.35 and 8.02 seconds, in contrast to the Engklek group's range of 6.86 to 8.10 seconds. The results indicate that Lompat Tali activities may be more efficacious in enhancing speed, which is crucial for the approach phase of the long jump. Prior research has confirmed the beneficial effects of plyometric training on speed, indicating that these exercises enhance both sprinting velocity and total speed endurance (Kryeziu et al., 2023). The integration of plyometric exercises and speed training has demonstrated efficacy in augmenting speed development through the enhancement of muscle flexibility and the effectiveness of force application (Naidu, 2016).

Finally, the long jump proficiency statistics reveal that the Lompat Tali group obtained greater outcomes, with mean distances ranging from 73.00 cm to 90.33 cm, compared to the Engklek group's range of 69.67 cm to 87.00 cm. This difference may be related to the greater explosive power and speed developed during Lompat Tali activities, which are important components of good long jump performance. Prior research indicates that motor abilities, including coordination, precision, and balance, are crucial for enhancing long jump performance (Kastrena et al., 2019), and Lompat Tali exercises probably have a more substantial role in developing these attributes. The enhancements in explosive strength and speed from Lompat Tali immediately result in a more powerful push-off and increased take-off velocity in the long jump, hence improving overall performance.

This study's findings underscore the potential of traditional games, specifically Lompat Tali, in enhancing essential motor skills that influence athletic performance. The results underscore the necessity of incorporating culturally relevant physical activities into educational curricula to foster motor skill development in children. However, the study has limitations; the sample size was relatively small, which may restrict the generalizability of the findings to a broader population. Furthermore, the study's duration of four weeks may be inadequate to assess the long-term effects of these activities on motor skill development. Future research should examine the enduring impact of traditional games on motor skill enhancement and athletic performance, as well as explore the advantages of integrating these activities with other training methodologies.

Conclusion

This study concludes that *Lompat Tali* is more effective than *Engklek* in improving explosive power, speed, and long jump performance, while *Engklek* is particularly beneficial for enhancing coordination. These results emphasize

the value of integrating traditional games into physical education as culturally relevant and engaging activities to develop motor skills in children aged 10–11. Future research should involve larger and more diverse samples, longer intervention periods, and the inclusion of external factors such as nutrition and sleep to provide a more comprehensive understanding of their impact on athletic performance.

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