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The Relationship of Physical Fitness and Mental Readiness to Learning Outcomes in Rhythmic Gymnastics Practice

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Abstract. This study aimed to analyze the relationship between physical fitness, mental readiness, and rhythmic gymnastics practical learning outcomes among elementary school students. This quantitative correlational study involved 26 sixth-grade students from SDN Mangli 04, selected using a total sampling technique. The research instruments consisted of the Indonesian Physical Fitness Test (TKJI), a mental readiness questionnaire (24 Likert-scale items; Cronbach's Alpha = 0.861), and an observation sheet for rhythmic gymnastics performance. Data were analyzed using both descriptive and inferential statistics. Descriptively, the students' physical fitness, mental readiness, and practical learning outcomes fell into the "good" category. However, multiple correlation analysis revealed that physical fitness and mental readiness did not have a significant simultaneous relationship with rhythmic gymnastics practical learning outcomes. This result is attributed to a restriction of range and the fact that assessments were dominated by the mastery of technical motor skills. In conclusion, while physical fitness and mental readiness serve as a solid foundation, achieving proficiency in rhythmic gymnastics practical skills still requires specific coaching strategies and direct technical practice.

Keywords: Physical Fitness; Mental Fitness; Rhythmic Gymnastics; Learning Outcomes.

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INTRODUCTION

Physical fitness activities are a crucial element of Physical Education, Sports, and Health (PJOK) instruction at the elementary school level(Mahyuddin, 2025) PJOK focuses not only on strengthening students' physical capabilities but also plays a role in shaping psychological aspects, such as emotional and mental stability (Barnett, 2016). Implementing PJOK strategies designed to be enjoyable and measurable has been shown to boost student enthusiasm and active engagement during the learning process(Rodriguez, 2019) . A stable mental state supports optimal learning outcomes, whereas emotional instability can hinder student engagement and achievement in the classroom.

During the elementary education phase, students are highly susceptible to emotional fluctuations as they navigate their socio-emotional development. Regular physical activity has been proven to reduce stress levels, alleviate anxiety, and foster a more positive mood (Saputra, 2025). Similar findings indicate a strong link between physical activity and mental health, including the ability to manage daily emotional pressures (Al Ardha, 2022). Routine participation in physical activity is also reported to enhance cognitive function and learning readiness, ultimately leading to improved academic performance (Azzahra, 2024).

One form of physical activity that is both enjoyable and suitable for elementary schools is rhythmic gymnastics. The combination of music and rhythmic movement in this activity has proven effective in improving students' concentration and mood, while also fostering active participation and cooperation among them (Ummah, 2024) Rhythmic gymnastics based on creative movement has also been reported to significantly boost students' self-confidence (Siregar, 2024) , aligning with findings that rhythmic gymnastics methods effectively develop children's kinesthetic intelligence (Harita, 2025) and positively impact both the physical fitness and mental well-being of elementary school students (Muna, 2026). However, the current implementation of Physical Education (PJOK) in elementary schools tends to focus solely on mastering basic movement skills (Muhyi, 2023) without giving adequate attention to the impact on students' emotional and mental states.

Literature regarding the application of rhythmic gymnastics has largely focused on purely motoric aspects and populations with special needs (Sugiyono, 2013)

consequently, research specifically linking physical and mental fitness to the rhythmic gymnastics learning outcomes of general-education students within the Indonesian Physical Education context remains limited. Given these facts, this study aims to analyze the relationship between physical fitness, mental fitness, and rhythmic gymnastics learning outcomes among elementary school students (Putri et al., 2024).

METHOD

This study employs a quantitative approach with a correlational design to analyze the relationship between physical fitness (X1) and mental fitness (X2) serving as independent variables and rhythmic gymnastics learning outcomes (Y) serving as the dependent variable. The relationships between these variables were tested using a multiple correlation technique based on the theory proposed by (Sugiyono, 2013) The subjects of this study were all 26 sixth-grade students at SDN Mangli 04. Given the limited population size, sampling was conducted using the saturated sampling (total sampling) technique, wherein the entire population served as the research sample (Sugiyono, 2013).

Data collection was carried out in a structured manner using three types of instruments: (1) The Indonesian Physical Fitness Test (TKJI), comprising sit-ups, push-ups, and a 40-meter run to measure students' physical fitness levels (X1) (2) A Likert-scale mental fitness questionnaire consisting of 24 statements to measure four psychological dimensions self-confidence, motivation, discipline, and emotional control (X2) and (3) A performance observation sheet to assess students' rhythmic gymnastics practical learning outcomes (Y), covering three core stages: the initial stance, core movements, and final stance (Budi, 2025).

Prior to use, the instruments' suitability was verified through validity analysis (r-value) and reliability testing using the Cronbach's Alpha formula; the resulting coefficient was 0.861, indicating that the instruments were reliable and suitable for use. The data collection process was conducted sequentially, beginning with the administration of the TKJI physical test, followed by the completion of the mental fitness questionnaire in the classroom, and concluding with direct observation of student performance while executing the full sequence of rhythmic gymnastics movements (Jerebine, 2022).

RESULT AND DISCUSSION

Result

The F-test aims to determine the effect of the independent variable physical fitness (X1) on the rhythmic gymnastics practical learning outcomes of students at SDN Mangli 04 (Y).

Table 1. F-test Data Description

Sumber Variasi	Sum of Squares	*df*	Mean Square	*F*	*p*
Between Groups	1348.679	18	74.927	1.054	.505
Within Groups	497.667	7	71.095		
Total	1846.346	25			

Based on the ANOVA test results in the table above, a significance value of 0.505 was obtained. Since this value exceeds 0.05, it can be concluded that the regression model used shows no significant simultaneous effect of physical fitness on the rhythmic gymnastics practical learning outcomes of students at SDN Mangli 04.

Table 2. Results of the Homogeneity of Variance Test for Pretest Scores (Levene's Test)

Test Basis	Levene's Statistic	df_1	df_2	*p*
Based on the mean	1.100	5	7	.438
Based on the median	0.436	5	7	.811
Based on the median with adjusted degrees of freedom	0.436	5	2.000	.804
Based on the trimmed mean	1.045	5	7	.461

Based on the homogeneity test results using Levene's Test, a significance value of 0.438 was obtained in the "Based on Mean" row. This value exceeds the significance level of 0.05 (0.438 > 0.05). Therefore, H_0 is accepted, indicating that the pretest data variances across groups are homogeneous (Tharina, 2026) Thus, the data satisfy the homogeneity assumption required for subsequent statistical analysis.

Table 3. Pretest–Posttest *t*-Test Results

Comparison	*N*	Mean	Standard Deviation	Calculated *t*	Critical *t*	*p*
Pretest–posttest	26	79.038	22.561	17.864	2.063899	< .001

The partial test (t-test) results indicate that physical fitness has a significant effect on students' learning outcomes in rhythmic gymnastics practice. A significance value of 0.000 (< 0.05) indicates that, although physical fitness is theoretically capable of

enhancing cognitive function, this study confirms that the effect is indeed significant (Adi, 2026).

Discussion

Based on the pretest and posttest t-test results, the calculated t-value was 17.864, while the t-table value was 2.063899 at a 5% significance level ($\alpha = 0.05$). Since the calculated t-value exceeds the t-table value ($17.864 > 2.063899$), the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted. Furthermore, a significance value (Sig.) of 0.000 ($p < 0.001$) was obtained. Since the Sig. value is less than 0.05 ($p < 0.05$), H_0 is rejected and H_a is accepted. Thus, there is a significant difference between the pretest and posttest results regarding physical fitness and mental readiness (Manalu, 2026)

The study's findings reveal an interesting pattern: while students' mental fitness, physical fitness, and rhythmic gymnastics performance generally fall into the "good" category, physical and mental fitness combined do not significantly contribute to the variation in students' practical learning outcomes (Destriana, 2022) This pattern warrants further interpretation rather than being dismissed merely as a failure to confirm the hypothesis.

The high levels of achievement in self-confidence and discipline align with (Kurniawan, 2022) findings that creative movement-based rhythmic gymnastics can boost the self-confidence of lower-grade students, as well as with the view (Ortega Saavedra, 2026) that the musical and rhythmic movement elements in rhythmic gymnastics foster concentration, a positive mood, and active student participation (Azis 2024) Similarly, the "good" rating in TKJI results reinforces the perspective (Haetami , 2026) that rhythmic gymnastics yields dual benefits positively impacting both the physical fitness and mental state of elementary school students. In other words, descriptively speaking, the rhythmic gymnastics program at SDN Mangli 04 appears successful in fostering students' psychological and physical aspects, as predicted by the literature.

However, the weak combined relationship between physical and mental fitness and practical learning outcomes requires careful explanation (Panggraita, 2025) One possibility is the "restriction of range" effect; since the majority of students scored in the "good" to "very good" categories across all three instruments, the variation in scores

among students was narrow, making it statistically difficult to establish a strong correlation even though, substantively, these three aspects remain interconnected within the instructional process (Hidayat, 2025) Another possibility is that the observation sheet assesses technical motor skills specifically the initial stance, core movements, and final pose which are influenced more by individual movement mastery and practice experience than by self-confidence, motivation, discipline, or physical condition alone. This aligns with the critique (Darmawan, 2024) that physical education in elementary schools tends to emphasize basic movement mastery; consequently, motor skill assessments may not fully reflect the psychosocial gains students achieve through rhythmic gymnastics.

These findings offer a significant contribution to similar studies. Unlike (Widiyanto, 2021) whose work indicates that rhythmic gymnastics literature often focuses on motor aspects and populations with special needs without rigorous statistical testing of relationshipsthis study explicitly examines the quantitative link between physical-mental fitness and practical learning outcomes among general-education elementary students. This analysis yields a crucial insight: high levels of physical and mental fitness cannot be automatically assumed to translate into high practical skill scores. Therefore, physical education teachers should treat the development of psychosocial aspects and the assessment of motor skills as complementary learning targets rather than variables where one automatically follows the other (Widiyanto, 2023). The implication is that while the holistic approach to physical education emphasized by (Widiyanto, 2021) and (Mufaridah, 2025) remains relevant for fostering emotional regulation and self-confidence through rhythmic gymnastics, the development of movement skills still requires distinct technical coaching strategies to ensure they progress in tandem with students' psychological readiness (Solahuddin, 2023).

Overall, the sixth-grade students at SDN Mangli 04 possess excellent non-academic and practical foundations. Their mental fitness falls into the "good" category, particularly regarding self-confidence and discipline (Marani, 2024) . Similarly, their physical fitness and rhythmic gymnastics practical scores are satisfactory, with mastery of core movements yielding the highest marks (Solahuddin, 2023) However, when tested simultaneously, the combination of physical and mental fitness was found to have no strong or significant influence on their practical performance outcomes in rhythmic gymnastics (Widiyanto, 2025).

These results highlight a crucial point: mastering rhythmic gymnastics requires more than just physical health and mental readiness. There is another, far more critical factor namely, direct practice of technical motor skills. Therefore, physical education teachers are advised to continue employing a holistic approach (Ortega Saavedra, 2026) Physical, psychological, and technical movement aspects must be trained in a balanced and planned manner, as these abilities do not develop automatically simply because a student is physically fit or mentally prepared (Anjani, 2025).

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