

Correlation Between Silat Training and Motor Skill Improvement in Elementary School Children

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ABSTRACT

Objectives: This study investigated the correlation between traditional Silat training and motor skill development in elementary school children aged 7-12 years in Medan, Indonesia..

Methods: A cross-sectional study was conducted with 120 elementary school students from three schools in Medan city. Participants were divided into two groups: Silat practitioners (n=60) with minimum 6 months training experience, and control group (n=60) with no martial arts background. Motor skills were assessed using the Test of Gross Motor Development-3 (TGMD-3) and Bruininks-Oseretsky Test of Motor Proficiency-2 (BOT-2). Data analysis was performed using SPSS version 28.0.

Results: Silat practitioners demonstrated significantly higher motor skill scores compared to the control group ($p < 0.001$). Strong positive correlations were found between training duration and gross motor skills ($r = 0.78$, $p < 0.001$), fine motor skills ($r = 0.65$, $p < 0.001$), and overall motor proficiency ($r = 0.82$, $p < 0.001$). The Silat group showed superior performance in balance (18.4 ± 2.1 vs 14.2 ± 2.8), coordination (19.6 ± 1.9 vs 15.3 ± 2.4), and bilateral coordination (17.8 ± 2.3 vs 13.9 ± 2.7).

Conclusion: Traditional Silat training shows strong positive correlation with enhanced motor skill development in elementary school children, suggesting its potential as an effective physical education intervention for improving fundamental movement skills.

Keywords: Silat, motor skills, elementary school, physical education, martial arts, children development.

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INTRODUCTION

Motor skill development during elementary school years (ages 6-12) represents a critical period for establishing fundamental movement patterns that influence lifelong physical activity participation and overall health outcomes. Traditional martial arts, particularly Silat—Indonesia's indigenous combat sport—have gained recognition for their potential to enhance physical, cognitive, and social development in children. Silat, characterized by fluid movements, balance requirements, and coordination challenges, presents unique opportunities for comprehensive motor skill enhancement.

Previous research has demonstrated positive associations between martial arts training and motor skill development in children. Liu et al. (2020) found significant improvements in balance and coordination among children practicing Taekwondo for six months. Similarly, Mikel & Johnson (2019) reported enhanced gross motor skills in youth participating in Karate training programs. However, limited research specifically examines the relationship between traditional Indonesian Silat and motor skill development in elementary school populations.

Studies on motor skill development indicate that structured physical activities incorporating multiple movement planes, balance challenges, and coordination requirements produce superior outcomes compared to traditional physical education alone (Smith & Anderson, 2021). The complex movement patterns inherent in Silat training align with motor learning principles that promote neuroplasticity and skill acquisition during critical developmental periods.

Despite growing interest in martial arts as developmental interventions, several gaps exist in current literature. First, limited research addresses the specific benefits of traditional Silat training on motor skill development. Second, few studies examine the correlation between training duration and motor skill improvements in Southeast Asian populations. Third, there is insufficient evidence regarding the comparative effectiveness of Silat versus other physical activities for motor skill enhancement in elementary school children.

Given Indonesia's rich Silat heritage and the increasing emphasis on quality physical education, investigating the relationship between Silat training and motor skill development addresses both cultural preservation and evidence-based practice needs. Understanding these correlations can inform physical education curricula, support traditional sport development, and provide evidence for incorporating martial arts into school-based interventions.

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This study aimed to: (1) examine the correlation between Silat training participation and motor skill proficiency in elementary school children; (2) assess the relationship between training duration and motor skill development; (3) compare motor skill performance between Silat practitioners and non-practitioners; and (4) identify specific motor skill domains most influenced by Silat training.

METHODOLOGY

Studi Participant

The study recruited 120 elementary school students aged 7-12 years from three public elementary schools (SD Negeri) in Medan city, North Sumatra, Indonesia. Participants were selected through purposive sampling and divided into two groups: Silat practitioners (n=60) with minimum six months of regular training experience (3+ sessions per week), and a control group (n=60) with no martial arts background but regular physical education participation. Inclusion criteria included absence of developmental disorders, no history of motor impairments, and informed parental consent. The study was approved by the Ethics Committee of Universitas Negeri Medan (Protocol #2024/STOKBG/Ethics/156).

Study Organization

This cross-sectional comparative study was conducted between March and May 2024. Data collection occurred during regular school hours with standardized testing protocols administered by certified physical education specialists. Silat practitioners were recruited from established Silat clubs affiliated with participating schools, while control participants were randomly selected from general school populations.

Test and Measurement

Motor skills were assessed using validated instruments:

1. Test of Gross Motor Development-3 (TGMD-3): Evaluated locomotor skills (run, gallop, hop, leap, horizontal jump, slide) and ball skills (two-hand strike, one-hand strike, dribble, catch, kick, overhand throw, underhand throw).
2. Bruininks-Oseretsky Test of Motor Proficiency-2 (BOT-2): Assessed fine motor precision, fine motor integration, manual dexterity, bilateral coordination, balance, running speed and agility, upper-limb coordination, and strength.

Testing sessions lasted approximately 90 minutes per participant, with standardized warm-up procedures and rest intervals. All assessments were video-recorded for reliability analysis, with inter-rater reliability exceeding 0.90 for all measures

Statistical Analysis

Quantitative data were analyzed using SPSS version 28.0. Descriptive statistics included means, standard deviations, and frequency distributions. Independent t-tests compared motor skill scores between groups. Pearson correlation coefficients examined relationships between training duration and motor skill variables. Effect sizes were calculated using Cohen's d. Statistical significance was set at $p < 0.05$, with Bonferroni corrections applied for multiple comparisons.

RESULTS

Participant Characteristics

The final sample included 120 participants (62 males, 58 females) with mean age 9.4 ± 1.6 years. Silat practitioners averaged 14.3 ± 8.2 months of training experience. No significant differences existed between groups for age ($p = 0.43$) or BMI ($p = 0.67$).

Motor Skill Performance Comparisons

Table 1: Motor Skill Performance by Group

Motor Skill Domain	Silat Group (n=60)	Control Group (n=60)	p-value	Cohen's d
Gross Motor Skills	87.6±9.2	76.4±11.8	<0.001	1.05
Fine Motor Skills	84.3±8.7	78.1±9.4	0.001	0.68
Balance	18.4±2.1	14.2±2.8	<0.001	1.67
Coordination	19.6±1.9	15.3±2.4	<0.001	1.98
Bilateral Coordination	17.8±2.3	13.9±2.7	<0.001	1.55
Running Speed/Agility	16.2±2.5	14.8±2.9	0.008	0.52

Correlation Analysis

Strong positive correlations emerged between Silat training duration and motor skill variables:

Gross motor skills: $r = 0.78$, $p < 0.001$

Fine motor skills: $r = 0.65$, $p < 0.001$

Balance: $r = 0.81$, $p < 0.001$

Bilateral coordination: $r = 0.74$, $p < 0.001$

Overall motor proficiency: $r = 0.82$, $p < 0.001$

Age-Stratified Analysis

When analyzed by age groups (7-8 years, 9-10 years, 11-12 years), Silat practitioners consistently outperformed controls across all age categories, with effect sizes ranging from moderate ($d=0.6$) to large ($d=1.8$).

DISCUSSION

The findings demonstrate a robust positive correlation between Silat training and motor skill development in elementary school children. The large effect sizes observed across multiple motor skill domains suggest that Silat training provides comprehensive motor development benefits beyond those achieved through standard physical education curricula.

These results align with previous martial arts research while extending findings to traditional Indonesian Silat. The observed correlation strengths ($r=0.65-0.82$) exceed those reported in similar studies examining Karate ($r=0.45-0.67$) and Taekwondo ($r=0.52-0.71$) training effects (Martinez et al., 2021; Chen & Wong, 2020). This suggests that Silat's unique movement characteristics—emphasizing multi-planar movements, ground-based techniques, and complex coordination patterns—may provide superior motor development stimulus.

The strong correlations between training duration and motor skill improvements suggest dose-response relationships, indicating that sustained Silat participation yields progressive benefits. The particularly strong associations with balance and bilateral coordination reflect Silat's emphasis on stance work, asymmetrical movements, and cross-lateral coordination patterns. These findings support incorporating traditional martial arts into school-based physical education programs, potentially addressing declining youth fitness levels while preserving cultural heritage.

Several limitations warrant consideration. The cross-sectional design prevents causal inference establishment. Selection bias may exist, as Silat participants might possess inherent motor skill advantages. The study's geographic limitation to Medan city limits generalizability to other Indonesian regions. Additionally, potential confounding variables (socioeconomic status, additional physical activities) were not fully controlled. Future longitudinal studies with randomized controlled designs would strengthen causal evidence.

CONCLUSION

This study provides compelling evidence for strong positive correlations between traditional Silat training and motor skill development in elementary school children. The robust relationships observed across multiple motor domains, particularly balance and coordination, suggest that Silat training offers comprehensive developmental benefits exceeding those of conventional physical education approaches.

The findings reinforce the importance of incorporating culturally relevant physical activities into educational curricula while supporting evidence-based practice in youth development programs. The dose-response relationships observed between training duration and motor skill improvements indicate that sustained participation yields progressive benefits, supporting long-term program implementation.

These results have significant implications for physical education policy, traditional sport development, and public health initiatives targeting youth motor skill enhancement. School administrators and physical education specialists should consider integrating Silat training into existing curricula to promote both motor skill development and cultural preservation.

Future research should examine longitudinal effects of Silat training, investigate optimal training protocols for different age groups, and explore cognitive and social benefits associated with traditional martial arts participation. Randomized controlled trials would further strengthen evidence for Silat's effectiveness as a motor skill intervention.

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Conflict of Interests

The authors declare no conflicts of interest regarding this research. No financial support was received from martial arts organizations or equipment manufacturers that could influence study outcomes.

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