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Community Service

Empowerment of Elementary School Students through Physical Activity Gymnastics Program in Medan City

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ABSTRACT

Objectives: Physical inactivity among elementary school students has become a growing concern in urban areas, including Medan City. The lack of structured physical activity programs in schools contributes to declining fitness levels and increases the risk of childhood obesity. This community service program addresses the urgent need to promote physical activity through gymnastics exercises among elementary school students. This program aimed to empower elementary school students by implementing a structured gymnastics-based physical activity program, improving students' knowledge about the importance of physical fitness, and enhancing their motor skills through systematic exercise routines.

Methods: The program was conducted at three elementary schools in Medan City, involving 150 students aged 9-12 years. The implementation included socialization sessions, gymnastics training workshops for teachers, practical demonstrations, and regular practice sessions over eight weeks. Pre-test and post-test assessments were conducted using fitness tests and questionnaires to evaluate knowledge improvement.

Results: The results showed significant improvement in students' physical fitness levels (78% increase in cardiovascular endurance), knowledge about physical activity benefits (85% improvement), and motor skill proficiency (72% enhancement). Student satisfaction reached 92%, and teacher competency in delivering gymnastics instruction increased by 88%.

Conclusion: This program successfully established sustainable physical activity routines in partner schools, trained 15 teachers as gymnastics instructors, and created a replicable model for other schools in Medan City.

Keywords: community empowerment; elementary school students; gymnastics; physical activity; Medan City.

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INTRODUCTION

Physical activity is essential for the healthy development of children, contributing to their physical, cognitive, and psychosocial well-being (World Health Organization, 2020). However, in recent decades, there has been a significant decline in physical activity levels among school-age children globally, particularly in urban environments where sedentary lifestyles have become increasingly prevalent (Guthold et al., 2020). Indonesia, as one of the most populous countries in Southeast Asia, faces similar challenges in promoting physical activity among its young population.

Medan City, the capital of North Sumatra Province, represents a typical Indonesian urban setting where elementary school students are increasingly exposed to sedentary behaviors due to technological advancements and changing lifestyle patterns. Recent studies indicate that approximately 60% of elementary school students in Indonesian urban areas do not meet the recommended 60 minutes of daily physical activity (Ministry of Health Republic of Indonesia, 2022). This sedentary trend has contributed to rising rates of childhood obesity, decreased physical fitness levels, and increased risk of non-communicable diseases later in life (Riskesdas, 2018).

Gymnastics, as a fundamental form of physical activity, offers numerous benefits for elementary school students. It promotes flexibility, strength, coordination, and balance while being adaptable to various skill levels and age groups (Federation Internationale de Gymnastique, 2021). Rhythmic gymnastics, in particular, combines physical exercise with music and creative expression, making it an engaging and enjoyable activity for young learners (Donti et al., 2019). Previous research has demonstrated that structured gymnastics programs can significantly improve children's motor competence, physical fitness, and self-confidence (Rudd et al., 2020).

The theoretical foundation of this community service program is based on the Social-Ecological Model of health promotion, which emphasizes the importance of creating supportive environments for physical activity at multiple levels:

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individual, interpersonal, organizational, community, and policy (McLeroy et al., 1988). By targeting elementary schools as organizational settings and involving teachers as key stakeholders, this program aims to create sustainable changes in physical activity behavior among students.

Additionally, this program is grounded in Self-Determination Theory (SDT), which posits that intrinsic motivation for physical activity is enhanced when individuals experience autonomy, competence, and relatedness (Deci & Ryan, 2008). The gymnastics program was designed to foster these psychological needs by providing students with choices in activities, progressive skill development, and opportunities for social interaction with peers and teachers.

Several previous community service programs and research studies have demonstrated the effectiveness of school-based physical activity interventions. A systematic review by Kriemler et al. (2011) found that multi-component interventions involving curriculum changes, teacher training, and environmental modifications were most effective in promoting physical activity among school children. Similarly, a study in Jakarta elementary schools showed that structured exercise programs could improve students' cardiovascular fitness by up to 25% over a semester (Setiawan et al., 2019).

Based on preliminary assessments conducted in partner schools, several key problems were identified: (1) limited time allocation for physical education in the curriculum; (2) lack of teacher competency in delivering varied physical activity programs; (3) inadequate facilities and equipment for structured physical activities; (4) low awareness among students and parents about the importance of regular physical activity; and (5) absence of standardized guidelines for implementing school-based gymnastics programs.

The specific objectives of this community service program were: (1) to implement a structured gymnastics-based physical activity program for elementary school students in Medan City; (2) to improve students' knowledge about the benefits of physical activity and healthy lifestyle; (3) to enhance students' motor skills and physical fitness through systematic gymnastics training; (4) to train teachers as competent gymnastics instructors who can sustain the program independently; and (5) to develop a replicable model for school-based physical activity programs.

This program provides multiple benefits for various stakeholders. For students, it offers improved physical fitness, motor skills, and knowledge about healthy lifestyles. For teachers, it provides professional development opportunities and enhanced competencies in delivering physical activity programs. For schools, it establishes sustainable physical activity routines and improves the overall health environment. For the broader academic community, this program contributes a validated model for school-based physical activity interventions that can be adapted and implemented in other settings. Furthermore, this program supports the Indonesian government's initiative to promote active lifestyles among school children as part of the national health promotion strategy.

METHODS OF IMPLEMENTATION

Location and Target

This community service program was conducted at three public elementary schools in Medan City, North Sumatra Province, Indonesia: SD Negeri 060819 Medan Kota, SD Negeri 064023 Medan Tuntungan, and SD Negeri 064975 Medan Johor. These schools were selected based on preliminary needs assessment, school accessibility, availability of adequate space for physical activities, and commitment from school administration to participate in the program.

The target population consisted of 150 elementary school students from grades 4-6 (aged 9-12 years), with 50 students from each school. This age group was selected because children at this developmental stage are capable of learning complex motor skills and can benefit significantly from structured physical activity programs (Gallahue et al., 2012). Additionally, 15 physical education teachers (5 from each school) participated as trainees who would become gymnastics instructors to ensure program sustainability.

Implementation Timeline and Phases

The program was implemented over a period of three months, from July to September 2024, comprising four main phases:

Table 1. Implementation Timeline and Phases of the Gymnastics-Based Physical Activity Program (July–September 2024)

Phase	Duration	Main Activities
Phase 1: Preparation and Socialization	Week 1–2	Coordination meetings with school principals and teachers; baseline assessment of students' physical fitness and physical activity knowledge; socialization sessions for students and parents; preparation of training materials and equipment.
Phase 2: Teacher Training Workshop	Week 3–4	Intensive workshops for physical education teachers covering theoretical foundations of gymnastics pedagogy, practical teaching and demonstration skills, safety procedures and injury prevention, and lesson planning and program management.
Phase 3: Program Implementation	Week 5–10	Delivery of gymnastics sessions three times per week (60 minutes per session) for six weeks, including warm-up and stretching, basic gymnastics movements (floor exercises, balance,

		coordination), rhythmic gymnastics with music, cool-down activities, and educational sessions on physical activity benefits.
Phase 4: Evaluation and Sustainability Planning	Week 11–12	Post-test assessments of students' physical fitness and knowledge; evaluation of teacher competencies; student and teacher satisfaction surveys; documentation and reporting; development of sustainability and follow-up action plans for each participating school.

Table 2. Approach Methods Employed in Program Implementation

Approach Method	Description
Training and Workshop	Structured training sessions designed to enhance teachers' competencies in gymnastics instruction, implemented using a train-the-trainer model to ensure long-term sustainability.
Demonstration and Practice	Gymnastics movements were demonstrated by expert instructors, followed by guided practice sessions allowing students to develop skills under direct supervision.
Mentoring and Accompaniment	Ongoing mentoring support was provided to teachers throughout the implementation phase to ensure correct technique delivery and to address instructional challenges.
Educational Sessions	Interactive learning sessions focused on the importance of physical activity, basic nutrition principles, and healthy lifestyle behaviors.
Participatory Approach	Active student involvement in selecting music and creating simple gymnastics choreographies to foster a sense of ownership, engagement, and intrinsic motivation.

Evaluation Instruments

The evaluation of program outcomes employed a comprehensive set of instruments. Physical fitness was measured using the Indonesian Physical Fitness Test (Tes Kesegaran Jasmani Indonesia/TKJI), administered both before and after the intervention to assess key components including cardiovascular endurance, muscular strength, speed, flexibility, and agility. Cognitive outcomes were assessed through a validated questionnaire comprising 20 multiple-choice items designed to measure students' knowledge of physical activity benefits, fundamental principles of gymnastics, and healthy lifestyle practices. Motor skill performance was evaluated using a standardized gymnastics skills rubric that assessed technique, coordination, balance, and overall movement quality on a five-point scale. In addition, teacher competency was examined through a practical assessment focusing on teachers' ability to demonstrate movements accurately, provide constructive feedback, and effectively manage gymnastics learning sessions. Finally, program satisfaction was measured using Likert-scale questionnaires administered to both students and teachers to capture perceptions of program delivery, content relevance, and perceived benefits.

RESULTS & DISCUSSION

Program Participation

The program achieved high participation rates throughout the implementation period. Of the 150 students enrolled, 142 (94.7%) completed the full program, attending at least 15 of the 18 scheduled sessions. The attendance rate averaged 91.3% across all schools, indicating strong engagement and interest in the program. All 15 teachers completed the training workshop and actively participated in the mentoring sessions.

Table 3. Participation Rate by School

School	Enrolled	Completed	Attendance (%)	Teachers
SD Negeri 060819	50	48	92.4	5
SD Negeri 064023	50	47	89.6	5
SD Negeri 064975	50	47	91.8	5
Total/Average	150	142	91.3	15

Physical Fitness Improvement

The physical fitness assessment using the Indonesian Physical Fitness Test (TKJI) revealed significant improvements across all components. Table 2 presents the pre-test and post-test results for each fitness component.

Table 4. Physical Fitness Test Results (n=142)

Fitness Component	Pre-test (Mean±SD)	Post-test (Mean±SD)	Improvement (%)	p-value
Cardiovascular Endurance	2.14±0.45	3.81±0.38	78.0	<0.001*
Muscular Strength	2.35±0.52	3.58±0.41	52.3	<0.001*
Flexibility	2.48±0.61	3.92±0.35	58.1	<0.001*
Agility	2.28±0.55	3.65±0.42	60.1	<0.001*
Balance	2.52±0.48	3.78±0.39	50.0	<0.001*
Overall TKJI Score	11.77±2.12	18.74±1.85	59.2	<0.001*

*Note: *Significant at p<0.05; Scale 1-5 for each component (max total score = 25)*

The most notable improvement was observed in cardiovascular endurance (78%), followed by agility (60.1%) and flexibility (58.1%). These findings are consistent with previous research demonstrating that rhythmic gymnastics effectively improves cardiovascular fitness and flexibility in school-age children (Donti et al., 2019). The significant

improvement in cardiovascular endurance can be attributed to the continuous nature of gymnastics movements performed with music, which maintains elevated heart rates throughout the sessions.

Knowledge Improvement

Students' knowledge about physical activity and healthy lifestyle showed substantial improvement following the educational sessions integrated into the program. The mean pre-test score was 52.3 (±12.4) out of 100, which increased to 89.6 (±8.2) in the post-test, representing an 85% improvement ($p<0.001$). The improvement was consistent across all knowledge domains assessed, including benefits of physical activity, basic gymnastics concepts, nutrition knowledge, and healthy lifestyle practices.

Motor Skill Development

The motor skill assessment revealed significant improvement in students' gymnastics competencies. Table 3 presents the pre-test and post-test results for motor skill components.

Table 6. Motor Skill Assessment Results (n=142)

Skill Component	Pre-test (Mean±SD)	Post-test (Mean±SD)	Improvement (%)	p-value
Movement Technique	2.18±0.54	3.85±0.42	76.6	<0.001*
Coordination	2.25±0.48	3.72±0.38	65.3	<0.001*
Rhythm & Timing	2.08±0.62	3.68±0.45	76.9	<0.001*
Movement Quality	2.32±0.51	3.91±0.36	68.5	<0.001*
Overall Motor Skill	2.21±0.46	3.79±0.35	71.5	<0.001*

*Note: *Significant at p<0.05; Scale 1-5*

The overall motor skill improvement of 71.5% demonstrates the effectiveness of the structured gymnastics program in developing students' movement competencies. This finding aligns with the motor learning literature, which suggests that regular, progressive practice with appropriate feedback leads to significant skill acquisition in children (Schmidt & Lee, 2019).

Teacher Competency Development

The teacher training component achieved remarkable success, with all 15 teachers demonstrating significant improvement in their ability to deliver gymnastics instruction. Pre-training competency assessment showed a mean score of 45.2 (±15.3) out of 100, which increased to 85.1 (±7.8) post-training, representing an 88% improvement. Teachers showed particular improvement in demonstration skills (92% increase), lesson planning (85% increase), and student feedback provision (84% increase).

Satisfaction Assessment

The satisfaction survey revealed high levels of satisfaction among both students and teachers. Student satisfaction reached 92%, with 95% indicating they would like to continue participating in similar programs. Teacher satisfaction was 94%, with all teachers expressing confidence in their ability to continue the program independently. Key factors contributing to high satisfaction included the enjoyable nature of gymnastics with music, clear progression of skills, supportive learning environment, and visible improvement in fitness and skills.

Table 7. Satisfaction Assessment Results

Satisfaction Item	Students (n=142)	Teachers (n=15)	Overall (%)
Program content quality	93%	95%	94%
Instructor effectiveness	94%	92%	93%
Perceived personal benefit	91%	96%	93.5%
Willingness to continue	95%	100%	97.5%
Overall Satisfaction	92%	94%	93%

Supporting Factors and Challenges

Several factors contributed to the program's success. First, strong support from school administrators facilitated scheduling and resource allocation. Second, the enthusiastic participation of teachers created a positive learning environment. Third, the use of music and progressive skill development maintained student engagement throughout the program. Fourth, the availability of adequate space and basic equipment enabled effective implementation. However, some challenges were encountered during implementation. Initial resistance from some students who were unfamiliar with structured physical activities was addressed through gradual introduction and peer support. Limited equipment in some schools was mitigated by adapting exercises to use minimal equipment. Scheduling conflicts with academic activities required flexible arrangement of sessions. Hot and humid weather conditions necessitated adequate hydration breaks and modified exercise intensity during outdoor sessions. The findings of this program align with the Social-Ecological Model framework, demonstrating that interventions targeting multiple levels (individual knowledge and skills, interpersonal relationships between teachers and students, organizational support from schools) are more effective in promoting sustainable behavior change (McLeroy et al., 1988). The high satisfaction rates and willingness to continue suggest that the program successfully fostered intrinsic motivation, supporting Self-Determination Theory principles (Deci & Ryan, 2008).

CONCLUSION

This community service program successfully achieved its objectives of empowering elementary school students through a structured gymnastics-based physical activity program in Medan City. The key outcomes include significant improvements in students' physical fitness (59.2% overall improvement), with cardiovascular endurance showing the highest improvement (78%). Students' knowledge about physical activity and healthy lifestyle increased by 85%, while motor skills improved by 71.5%. Fifteen teachers were trained as competent gymnastics instructors, showing 88% improvement in teaching competency. High satisfaction rates (92% for students, 94% for teachers) indicate the program's acceptability and relevance.

The program has created tangible benefits for partner schools and the broader community. Students have developed healthier habits and improved physical capabilities that will contribute to their overall well-being. Teachers have gained valuable skills that enable them to sustain and expand the program independently. Schools now have established routines for structured physical activities that can be integrated into their regular curriculum.

Based on the experience and findings of this program, several recommendations are proposed for future development. First, scaling up the program to include more schools in Medan City and other regions of North Sumatra would maximize impact. Second, developing comprehensive teacher training modules that can be disseminated widely would ensure program sustainability and quality. Third, integrating the gymnastics program into the formal physical education curriculum would institutionalize the benefits. Fourth, conducting longitudinal follow-up assessments to evaluate the long-term impact on students' physical activity behavior and health outcomes would provide valuable evidence for program refinement. Fifth, establishing partnerships with local health authorities and sports organizations would strengthen program sustainability and resource availability. Sixth, developing age-appropriate variations of the program for younger (grades 1-3) and older (junior high school) students would extend the program's reach and impact.

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