JISIP (Jurnal Ilmu Sosial dan Pendidikan)
Vol. 10 No. 3 Juli 2026
e-ISSN : 2656-6753, p-ISSN: 2598-9944
DOI: *10.36312/jisip.v10i3.10924/http://ejournal.mandalanursa.org/index.php/JISIP/index*

Physical fitness model in increasing the physical activity of female students of SDN 2 Perampuan

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Article Info
Article history:
Received: 15 June 2026
Publish: 1 July 2026

Keywords:
Physical Physical Fitness Model;
Physical Activity;
PJOK Learning;
Female SDN 2 Students.

Abstract
This study aims to demonstrate that a physical fitness-based learning model significantly contributes to increasing students' physical activity. Learning approaches that emphasize structured physical activity, movement variations, and active student engagement have been shown to improve students' fitness levels and participation in physical activity (Smith & McKenzie, 2018). Furthermore, a study by Lubans et al. (2016) confirmed that systematically designed physical education interventions can significantly increase students' active time (moderate-to-vigorous physical activity) in elementary school settings. This finding is further supported by research by Dale et al. (2019), which states that a physical activity-based learning model integrated into the curriculum can improve students' daily movement habits. In the context of education in Southeast Asia, research by Sulaiman and Hamzah (2020) shows that physical fitness learning packaged in the form of games and varied activities can increase students' motivation and engagement in physical activity. Similar findings were also found by Putra et al. (2021), who stated that an active learning approach in physical education has a positive impact on improving students' fitness and interest in sports. However, most previous studies have focused on improving general fitness, without specifically addressing changes in elementary school students' daily physical activity within the context of structured, fitness-based learning in elementary schools in specific areas. This situation indicates a research gap that needs to be filled. The scientific uniqueness of this study lies in the application of a physical fitness learning model contextualized to the conditions of elementary school students at SD 2 Perampuan. This study not only measures fitness improvements but also specifically analyzes changes in students' physical activity based on various indicators of daily and weekly activity, as well as the types of physical activity undertaken. Thus, this study provides a more comprehensive picture of the impact of learning models on students' physical activity behavior. This model also helps to shape healthy lifestyle habits and increase students' physical activity. During elementary school age, children are in a phase of very rapid motor development, making physical activity a crucial component in supporting their physical, cognitive, and social growth. However, in practice, students' physical activity levels are often suboptimal due to limited learning variations, low motivation to move, and the dominance of sedentary activities outside of school.

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1. INTRODUCTION

Physical education in elementary schools plays a strategic role in developing healthy lifestyle habits and increasing students' physical activity. During elementary

school, children are in a phase of rapid motor development, making physical activity a crucial component in supporting their physical, cognitive, and social growth. However, in practice, students' physical activity levels are often suboptimal due to limited learning variations, low motivation to move, and the dominance of sedentary activities outside of school. The phenomenon of declining physical activity in elementary school-aged children is a global concern because it has the potential to increase the risk of obesity, health problems, and low physical fitness. Therefore, a learning model is needed that can encourage students' active involvement in sustainable and enjoyable physical activities in the school environment. Various studies have shown that physical fitness-based learning models have a significant contribution to increasing students' physical activity. Learning approaches that emphasize structured physical activity, movement variations, and active student involvement have been shown to increase students' fitness levels and participation in physical activity (Smith & McKenzie, 2018).

Furthermore, a study by Lubans et al. (2016) confirmed that systematically designed physical education interventions can significantly increase students' active time (moderate-to-vigorous physical activity) in elementary school settings. This finding is further supported by research by Dale et al. (2019), which states that a physical activity-based learning model integrated into the curriculum can improve students' daily movement habits. In the context of education in Southeast Asia, research by Sulaiman and Hamzah (2020) shows that physical fitness learning packaged in the form of games and varied activities can increase students' motivation and engagement in physical activity. Similar findings were also found by Putra et al. (2021), who stated that an active learning approach in physical education has a positive impact on improving students' fitness and interest in sports.

However, most previous research has focused on improving general fitness, without specifically addressing changes in elementary school students' daily physical activity within the context of structured, fitness-based learning in a specific elementary school district. This situation indicates a research gap that needs to be filled. The scientific uniqueness of this study lies in the application of a physical fitness learning model contextualized to the conditions of elementary school students at SD 2 Perampuan.

This study not only measures fitness improvements but also specifically analyzes changes in students' physical activity based on various daily and weekly activity indicators, as well as the types of physical activity performed.

Thus, this study provides a more comprehensive picture of the impact of learning models on students' physical activity behavior. Based on this background, the problem formulation in this study is: whether *the physical fitness learning model can increase the physical activity of female elementary school students?* The hypothesis of this research is: *There was an increase in students' physical activity after the implementation of the physical fitness learning model at SD 2 Perampuan*

This study aims to analyze and describe the increase in students' physical activity after the implementation of a physical fitness learning model at SD 2 Perampuan. Specifically, this study also aims to determine changes in students' physical activity based on daily activity indicators, types of physical activity, and activity category levels before and after the treatment.

2. RESEARCH METHODS

This research uses a quantitative approach with a pre-experimental type. One-group pretest–posttest design. This design is used to examine the effect of a treatment on research variables without a control group, by comparing conditions before and after the treatment (Sugiyono, 2019; Creswell, 2018). The research design can be described as follows:

Table 1. One Group Pretest–Posttest Research Design

Subject	Pretest	Treatment (X)	Posttest
Elementary School 2 Female Students	O_1	Physical fitness learning model	O_2

Description: O_1 = initial measurement of physical activity
O_2 = final measurement of physical activity
X = application of the physical fitness learning model

The subjects in this study were 44 fifth-grade students of SD 2 Perampuan. The sampling technique used was total sampling, that is, the entire population was used as a research sample because the number was relatively small and could be reached as a whole (Arikunto, 2017).

This research consists of two main variables, namely:

Table 2. Research Variables

Variables	Variable Types	Indicator
Physical fitness learning model	Independent (X)	Fitness-based learning activities, movement variations, structured physical activity
Student physical activity	They depend (And)	Daily activities, sports activities, school activities, extracurricular activities

The research data were collected using a modified student physical activity questionnaire based on the physical activity indicators of elementary school-aged children. This instrument uses a Likert scale with a score range of 1–5. The indicators measured include sports activities (running, volleyball, aerobics, swimming, etc.), daily activities (Monday–Sunday), activities at school and outside of school, and physical recreation activities. Data collection was carried out in two stages, namely:

1. Pretest: measurement of physical activity before treatment
2. Posttest: measurement of physical activity after treatment

The research procedure is carried out through several stages as follows:

Research Algorithm**:**

1. Determining research subjects (grade V students)
2. Developing and validating research instruments
3. Conducting initial measurements (pretest)
4. Implementing a physical fitness learning model in the PJOK learning process
5. Implementing physical activity-based learning in a structured and varied manner
6. Conducting a final measurement (posttest)
7. Processing and analyzing research data
8. Drawing conclusions based on the results of the analysis

Visually, the research flow can be described as follows:

Figure 1. Research Procedure Flow

The data obtained were analyzed using descriptive and inferential statistics. Descriptive analysis was used to describe the average, minimum, maximum values, and distribution of students' physical activity categories. To test the differences between the pretest and posttest, inferential statistical tests were used. Because the data were paired and not always normally distributed, a statistical analysis was used **test** Wilcoxon Signed Rank Test (Field, 2018). This test aims to determine significant differences between two related measurements.

Decision-making criteria:

If the sig. value < 0.05, then there is a significant difference.

If the sig. value > 0.05, then there is no significant difference.

The effectiveness of the learning model was tested by comparing physical activity scores before and after treatment. Furthermore, a gain score analysis was conducted to briefly assess the magnitude of changes in each student's physical activity indicators. This study followed a simple experimental model with systematic steps focused on measuring changes in students' physical activity behavior after implementing the physical fitness learning model in an elementary school setting.

3. RESEARCH RESULT

This study aims to determine the increase in students' physical activity after the implementation of a physical fitness learning model. The research data were obtained from 44 fifth-grade students of SD 2 Perampuan through pre-test and post-test measurements. The instrument used contained 24 indicators of physical activity, including sports activities, activities during physical education lessons, activities during breaks, activities after school, weekend activities, and daily activities from Monday to Sunday. Scores used a range of 1 to 5, with the provision that the higher the score, the higher the level of physical activity of the students.

Table 3.1 Respondent Characteristics

Characteristics	Category	Frequenc	Percentage
Gender	Man	20	45,45%
Gender	Woman	24	54,55%
Age	11 years old	40	90,91%
Age	12 years old	4	9,09%
Class	In	44	100%

Based on Table 3.1, the study respondents numbered 44 students. Most of the students, 40 students (90.91%), were 11 years old. Based on gender, the respondents consisted of 20 male students and 24 female students.

Table 3.2 Summary of Students' Physical Activity Scores

Measurement Level	N	Rate-rate	Standard Deviation	Shoes Minimum	Maximum Score	Category

Pre-test	44	2,75	0,39	1,79	3,63	Currently
Post-test	44	3,50	0,30	2,92	4,25	High
Improvement	44	0,75	0,34	0,29	1,79	-

The results in Table 3.2 show that the average student physical activity score during the pre-test was 2.75, which is in the moderate category. After implementing the physical fitness learning model, the average score increased to 3.50, which is in the high category. Thus, there was an average increase of 0.75 points, or approximately 27.46%. All students experienced an increase in physical activity scores from the pre-test to the post-test.

Table 3.3 Distribution of Student Physical Activity Categories

Category	Pre-test	Percentag	Post-test	Percentag
Very low	1	2,27%	0	0%
Low	14	31,82%	0	0%
Currently	26	59,09%	21	47,73%
High	3	6,82%	22	50,00%
Very high	0	0%	1	2,27%

Table 3.3 shows changes in students' physical activity categories after treatment. During the pre-test, most students were in the category. C**urrently, t**here were 26 students, while 14 students were still in the low category. After the post-test, there were no more students in the low or very low categories. A total of 22 students were in the high category, 21 students were in the medium category, and 1 student reached the very high category.

Table 3.4 Average Scores Based on Activity Groups

Activity Group	Pre-test	Post-test	Improvement	Percentage Improvement
Types of physical activity	2,52	3,33	0,82	32,57%
Time/context of activity	3,23	3,76	0,52	16,17%
Daily activities per week	2,90	3,67	0,77	26,37%

Based on Table 3.4, the largest increase occurred in the group **types of physical activity**, from an average of 2.52 to 3.33. This indicates that students became more active in various forms of physical activity after participating in the physical fitness learning model. There was also an increase in daily activity per week, from 2.90 to 3.67, indicating that student activity increased not only during class but also on other days.

Table 3.5 Activity Indicators with Notable Changes

Activity Indicator	Pre-test	Post-test	Improvement
Skates	1,84	3,52	1,68
Monday's activities	2,72	3,80	1,07
Sports walk	2,57	3,61	1,05
Other activities	2,50	3,50	1,00

Run	2,75	3,73	0,98
Love	2,66	3,64	0,98
Aerobics	2,75	3,70	0,95
Swimming	2,82	3,73	0,91
Rowing	1,63	1,81	0,19
Jump rope	1,75	1,91	0,16

Table 3.5 shows that almost all activity indicators increased. The largest increase was in the roller-skating indicator, which increased from 1.84 to 3.52. Furthermore, significant increases were also seen in Monday's activities, walking, other activities, running, volleyball, aerobics, and swimming. However, the rowing and rope jumping indicators still showed relatively small increases, so these two activities still require attention in the implementation of subsequent learning. To strengthen the results, the Wilcoxon test on the pre-test and post-test scores showed a significance value of $p < 0.001$. This indicates that there is a significant difference between students' physical activity before and after the implementation of the physical fitness learning model.

The results of the study indicate that the physical fitness learning model is able to increase the physical activity of students at SD 2 Perampuan. This is evident from the increase in the average physical activity score from 2.75 in the pre-test to 3.50 in the post-test. This change indicates that before the model was implemented, students' physical activity was in the moderate category, whereas after the model was implemented, it increased to the high category. This increase demonstrates that targeted physical fitness learning can encourage students to be more active. In the context of physical education learning in elementary schools, physical activity not only functions to improve physical fitness but also to foster active lifestyle habits from an early age. When students are given learning experiences involving various forms of physical activity, they are more easily motivated to participate actively. Changes in students' physical activity categories also showed positive results. During the pre-test, there were still 14 students in the low category and 1 student in the very low category. After the post-test, there were no longer any students in the low or very low categories. Conversely, the number of students in the high category increased to 22 students, and 1 student was in the very high category. These findings indicate that the physical fitness learning model has a fairly even impact on increasing students' physical activity. When viewed by activity group, the largest increase occurred in physical activity types. This indicates that students became more involved in various forms of physical activity after receiving instruction that emphasized physical fitness. Activities such as walking, running, volleyball, aerobics, swimming, and other activities showed significant increases. This condition shows that students tend to be more active when learning provides space for a variety of movements and interesting activities. The increase in daily activity per week also indicates that the influence of the learning model is not limited to physical education lessons at school. Student activity scores from Monday to Sunday increased, indicating that students' movement habits are beginning to develop in their daily lives. This is important because continuous physical activity can support students' fitness, health, and motor development. However, the results also indicate that several indicators still need improvement, particularly rope jumping and rowing. Both activities showed small increases compared to other indicators. The low increase could be due to limited facilities, students' lack of habit in these activities, or low student interest in certain types of activities. Therefore, teachers need to provide a variety of learning methods, provide alternative activities that are appropriate to school conditions, and create a safe and enjoyable learning atmosphere. Overall, the results of this study indicate that the physical fitness learning model is effective in increasing the physical activity of elementary

school students 2 Perampuan. The increase in average scores, changes in student categories to a higher level, and improvements in almost all physical activity indicators are evidence that physical fitness learning can be a relevant strategy for building active habits in elementary school students.

4. CONCLUSION

Based on the results of research conducted on fifth-grade students at SDN 2 Perampuan, it can be concluded that the implementation of the physical fitness learning model is effective in increasing students' physical activity. This improvement can be seen from the result of the measurement. Before and after treatment, the average student physical activity score increased from 2.75 in the moderate category to 3.50 in the high category. Furthermore, there was an average increase of 0.75 points, or approximately 27.46%, indicating a positive change in students' physical activity levels.

Changes in physical activity categories also showed significant results. Before the implementation of the physical fitness learning model, there were still students in the low and very low categories, whereas after the treatment, there were no more students in these categories. Most students moved into the medium, high, and very high categories. The Wilcoxon Signed Rank Test results showed a significance value of $p < 0.001$. the more strengthens that there is a significant difference between students' physical activity before and after the implementation of the physical fitness learning model.

Thus, the physical fitness learning model can be used as an effective alternative strategy for teaching physical education and health (PJOK) to increase the physical activity of elementary school students. This model not only increases student engagement in learning activities at school but also encourages the development of active lifestyle habits in daily life. Therefore, PJOK teachers are advised to apply structured, varied, and sustainable physical fitness learning to support increased physical activity and physical fitness of students.

5. ACKNOWLEDGEMENT

The author expresses his gratitude to the presence of Allah SWT for all His grace and gifts so that the research entitled “Physical Fitness Model in Increasing Physical Activities of Female Students of SDN 2 Perampuan” can be resolved well.

The author also expresses his deepest gratitude to the Principal of SDN 2, who provided permission and support for the implementation of this research. Thanks, are also extended to the Physical Education and Health teachers and all fifth-grade students of SDN 2 Perampuan who actively participated and assisted in the smooth running of the data collection process during the research.

In addition, the author would like to thank the supervising lecturer who has provided instructions, guidance, advice, and motivation throughout the process of compiling this research. The author also expresses his appreciation to his family, friends, and all parties who provided moral and material support so that this research could be completed.

Hopefully, all the assistance, support, and cooperation that has been given will be appreciated and multiplied by Allah SWT. The author hopes that the results of this research will benefit the development of science, particularly in the field of Physical Education, Sports, and Health (PJOK).

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