



The Effect of Aerobic Gymnastics on the Physical Fitness Level of Female Students of Grade XI of SMA Negeri 1 Hamparan Perak

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Abstract.

Background	The background to this research is the unknown effect of aerobic exercise on the physical fitness levels of eleventh-grade female students at SMA Negeri 1 Hamparan Perak.
Objectives	This study aimed to determine the effect of aerobic exercise on the physical fitness levels of eleventh-grade female students at SMA Negeri 1 Hamparan Perak. The subjects were all eleventh-grade female students at SMA Negeri 1 Hamparan Perak. This study was quantitative.
Methods	The research design used the "One Group Pretest-Posttest Design." Twenty subjects were recruited. The Indonesian Physical Fitness Test (TKJI) was used to assess students' physical fitness. Data analysis used a t-test, which included tests for normality and homogeneity.
Results	The results showed an effect of aerobic exercise on the physical fitness levels of eleventh-grade female students at SMA Negeri 1 Hamparan Perak. This result was confirmed by the comparison of the calculated t-test results for the pre-test and post-test groups, which was -10.771, greater than the t-table of 1.729.
Conclusion	Based on the analysis and hypothesis testing, it can be concluded that there is a significant effect of aerobic exercise on the physical fitness levels of eleventh-grade female students at SMA Negeri 1 Hamparan Perak. This result is supported by the comparison of the calculated t-test results for the pre-test and post-test groups, which is -10.771, which is greater than the t-table of 1.729.

Keywords: Aerobics, Fitness, Physical

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INTRODUCTION

Physical Education, Sports, and Health is a long-term investment in efforts to develop the quality of human resources in Indonesia. The expected outcomes of successful physical education can only be achieved over a relatively long period of time. Therefore, students require a long process, along with patience and sincerity, through Physical Education, Sports, and Health programs. As part of efforts to improve the quality of human resources, Physical Education in formal educational institutions must be able to develop more rapidly, with the aim of making Physical Education, Sports, and Health a foundation for comprehensive education. The process of attitude formation and motivation enhancement must be carried out continuously.

Efforts to educate the nation and improve the overall quality of Indonesia in realizing an advanced, just, and prosperous society based on Pancasila and the 1945 Constitution require basic education to serve as the foundation for national and state success. Physical education is essentially education through physical activity, which serves as a medium to achieve holistic individual development. Through physical education, students are socialized into physical activities, including the development of sports skills.

Physical education in schools is an integral part of the overall educational process and plays an important role in achieving educational goals. Therefore, the objectives of physical education are educational in nature. In its implementation, physical education is used as a learning vehicle or experience, through which students grow and develop to achieve educational goals. Physical education is a learning process designed to improve physical fitness, develop motor skills, knowledge, active lifestyle behaviors, and sportsmanship attitudes through physical activities (Ministry of National Education, 2020: 2). According to Arma Abdoellah and Agus Manadji (2022: 3), physical education needs to be provided in educational

institutions because physical activities in the form of exercise provide benefits to students in terms of physical fitness and health maintenance.

Furthermore, Arma Abdoellah and Agus Manadji (2022: 16) explain that the objectives of physical education and health are to help students improve physical fitness and health through positive understanding and awareness, as well as mastery of fundamental movement skills and various physical activities, so that:

1. Harmonious growth and physical fitness, particularly height and weight, are achieved.
2. Disciplined, honest attitudes and behaviors are developed, including compliance with applicable rules.
3. Enjoyment of physical activities that can be used for leisure time and the adoption of healthy lifestyle habits.
4. Understanding the benefits of physical education and health, as well as the achievement of better movement skills.
5. Improvement of health, physical fitness, and fundamental movement skills in various sports.

From the discussion above, it can be concluded that physical education is learning conducted through physical activities while also serving as a teaching process to develop physical fitness and foster sportsmanship. In general, physical education in schools is conducted only once a week with limited time allocation and a fixed subject structure. With such a learning process, there is concern that students may become bored with repetitive subjects. Moreover, learning media can also influence the learning process.

Learning conducted once a week is insufficient to significantly improve students' physical fitness; therefore, physical activities outside regular school hours are necessary. With programs that consider rules and implementation time, one such effort is incorporating aerobic exercise into learning activities. In addition, the school environment greatly influences children's opportunities to engage in physical activity. Limited schoolyard space restricts free movement, a condition commonly observed in urban schools. As is widely known, physical education is largely conducted outdoors. In urban areas, large playing fields are difficult to find, and even when available, they require considerable travel time. Therefore, activities that do not require large spaces are needed.

Success in achieving physical fitness is determined by the quality of training, which includes training objectives, selection of training models, training facilities, and training principles based on the FIT concept (Frequency, Intensity, and Time) (Djoko Pekik Irianto, 2021: 16). Aerobic exercise is one type of physical activity that improves fitness and is widely favored by people in both rural and urban areas, including males and females. This is because aerobic exercise can be performed collectively, is inexpensive, enjoyable, and provides immediate and tangible benefits.

Aerobic exercise is often defined as a form of exercise in which movements are selected and performed according to the participant's preferences and accompanied by music. When implemented as a program to improve students' physical fitness, aerobic exercise offers advantages compared to other types of sports activities. A healthy and fit body is everyone's aspiration; however, not everyone truly knows their fitness level without undergoing fitness testing. Good physical fitness is a fundamental asset that enables individuals to perform physical activities repeatedly over a relatively long period without significant fatigue. One important aspect to consider is that students' physical fitness is essential in supporting their growth and development. SMA Negeri 1 Hamparan Perak has a total of 297 students, consisting of 68 students in Grade X, 109 students in Grade XI, and 120 students in Grade XII.

Currently, awareness of students' physical fitness levels among physical education teachers has not received sufficient attention. In fact, conducting physical fitness tests is crucial to determine students' fitness levels. Optimal physical fitness can be achieved through proper, regular, and measurable physical training. If an individual feels excessively fatigued during activities that should not be tiring, it may indicate low fitness levels. Therefore, fitness tests should be conducted to measure students' physical fitness, either monthly or at the beginning of each semester. By implementing fitness tests as evaluation tools or as part of the learning improvement process, teachers are expected to be able to monitor students' physical fitness in general, and particularly that of female students at SMA Negeri 1 Hamparan Perak.

To date, aerobic exercise has been more popular among adults and housewives, while for senior high school students, aerobic exercise is still rarely or even never taught in schools. The low level of attention to this area presents an opportunity to introduce and develop aerobic exercise among senior high school students. This situation is further supported by students' low enthusiasm for physical education learning, particularly with regard to aerobic exercise.

METHOD

Research Design

This study used experimental research. According to Suharsimi Arikunto (2021: 273), "there are two types of experimental research: true experiments and experiments that are not true but merely resemble experiments. This is why this second type of research is known as a "quasi-experiment." This study used a quasi-experiment using a one-group pretest-posttest design, meaning the experiment is conducted on only one group without a comparison group.

Participant

This research was conducted at SMA Negeri 1 Hamparan Perak, located at Jl. Titi Payung, Jl. Bulu Cina, Klambir Lima Village, Hamparan Perak District, Deli Serdang Regency, North Sumatra. The sample for this study was 20 eleventh-grade female students at SMA Negeri 1 Hamparan Perak. According to Suharsimi Arikunto (2021: 134), if the sample size is less than 100, it is better to take all of them, so the research is a population study. Therefore, based on the definition of a sample above, the author chose a population study because the number of students or sample in grade XI was 20.

Data Analysis

The data obtained was collected, compiled, and analyzed using the following steps:

1) Physical Fitness Score Table and Norm Table

a) Physical Fitness Score Table

The physical fitness assessment was then assessed using a score table (for each test item).

Table 1. Indonesian Physical Fitness Test Scores for Girls Aged 16-18

50-Meter Run	Hanging with Elbow Bends	30-Second Sitting	Tecak Jump	800-Meter Run	Scores
s.d – 7.7"	41" to the top	28 to the top	50 to the top	S.d – 3'06"	5
7.8" – 8.7"	22" – 40"	19 – 27	39 – 49	3'07" – 3'55"	4
8.8"-9.9"	10" – 21"	9 – 18	30 – 38	3'56" – 4'58"	3
10.0" – 11.9"	3" – 9"	3 – 8	21 – 29	4'59 – 6'40"	2
12.0" – dst	0" – 2"	0 – 2	Sd.20	6'41" dst	1

b) Norm Table

After the test is conducted, the following norms are used to classify the TKJI of adolescents who have taken the test:

Table 2. Indonesian Physical Fitness Test Norms

No.	Total Value	Classification
1.	22 – 25	Very well
2.	18 – 21	Good
3.	14 – 17	Currently
4.	10 – 13	Not enough
5.	5 – 9	Very less

RESULTS AND DISCUSSION

Results

The data collected and analyzed are the results of the TKJI test, obtained from 20 research subjects who were given training treatment using aerobic gymnastics. Before being given treatment, an initial test was conducted to determine the initial physical fitness of students before being given training, after which they were given treatment for approximately 3 times a week for 12 meetings, then a final test was conducted to

determine whether there was an increase in fitness or not. To make the research easier to carry out, the two variables are symbolized in X1 for the Pre Test group, X2 for the Post Test group.

Data analysis was conducted using a t-test on the pre-test and post-test data from the 40-meter run test. This test tested the hypotheses:

H_a = There is an effect of aerobic exercise on the physical fitness levels of eleventh-grade female students at SMA Negeri 1 Hamparan Perak.

H_o = There is no effect of aerobic exercise on the physical fitness levels of eleventh-grade female students at SMA Negeri 1 Hamparan Perak.

To accept or reject the hypothesis, compare the calculated t-value with the tabled t-value. The criterion for accepting the hypothesis is if the calculated t-value lies between the negative and positive values of the tabled t-value ($-t_{1-1/2\alpha} < t < t_{1-1/2\alpha}$), or if the calculated significance level is greater than 0.05. To determine the effect of aerobic exercise on physical fitness in eleventh-grade female students at SMA Negeri 1 Hamparan Perak, a paired-sample t-test was used.

The t-test results obtained a calculated t value of -10.771 and a t table value at dk (0.05) (19) of 1.729 with a significance level of 0.000. Because the calculated t value is greater than the t table $-10.771 > 1.729$, it can be concluded that there is an effect of aerobic exercise on the physical fitness level of female students in grade XI of SMA Negeri 1 Hamparan Perak. Based on the table above, it can be seen that the average pre-test TKJI value is 14.20, while the average post-test TKJI value is 18.05.

The difference between the posttest and pretest averages was 3.85, representing a 27.11% increase.

Discussion

This study aimed to determine the effect of aerobic exercise training on the level of physical fitness of female Grade XI students at SMA Negeri 1 Hamparan Perak. The results of the study indicate that aerobic exercise training has a significant effect on the physical fitness level of female Grade XI students at SMA Negeri 1 Hamparan Perak. This is evidenced by the difference in mean scores between the pretest and posttest groups, where the pretest mean of 14.20 was lower than the posttest mean of 18.05.

Aerobic exercise is a type of health-oriented physical activity that involves systematic body movements performed in rhythm with music. However, in its development, aerobic exercise is not only taught to the general public but is also competed in for achievement purposes. Aerobic exercise is intended to improve heart and lung function as well as body conditioning. It follows a structured system of implementation, and by completing all stages of aerobic exercise systematically, it is expected that participants can achieve optimal levels of physical fitness. After performing aerobic exercise, participants should not experience injuries or excessive fatigue caused by inadequate cool-down activities, so that the benefits of the exercise can be clearly observed. This is provided that participants follow the prescribed stages and properly adhere to the instructor's guidance with full commitment.

Aerobic exercise involves fast-paced movements that engage the entire body. During aerobic exercise, the body undergoes continuous muscle contractions. As a result, physical fitness is developed when the body becomes accustomed to regular and measured physical activity.

When performing aerobic exercise, students indirectly engage in rapid movements, which help train them to move quickly and improve physical fitness. Consequently, their level of physical fitness increases. The increase reached 27.11%, which can be considered a positive improvement, given that the students only completed 12 training sessions. Greater improvements in physical fitness are likely to occur with more frequent and consistent training.

CONCLUSION

Based on the analysis and hypothesis testing, it can be concluded that there is a significant influence of aerobic exercise on the physical fitness level of female students in grade XI of SMA Negeri 1 Hamparan Perak. This result is proven by the comparison of the calculated results in the t-test of the pre-test and post-test groups of -10.771, which is greater than the t-table of 1.729.

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AUTHOR CONTRIBUTION STATEMENT

This research was conceptualized and designed by Ramdani Wijaya Agora, who developed the research objectives and methodology, managed data collection, coordinated with participants, and supervised fieldwork at STOK Bina Guna Medan. Eka Abdurrahman and Hafiz Yazid Lubis performed data analysis, interpreted the findings, and contributed significantly to the preparation of the manuscript. All authors participated in the revision of the manuscript, approved the final version for submission, and take full responsibility for the integrity and accuracy of the work.

CONFLICT OF INTEREST AND FUNDING

The authors declare no conflict of interest related to the conduct, authorship, or publication of this study.

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