

Biofit School; Health and Body Fitness Education Based on Biological Concepts for Junior High School Students

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Abstract

This program aimed to: (1) enhance students' understanding of physical fitness and health through education based on biological concepts, and (2) promote healthy lifestyle habits through regular physical activity to maintain health and physical fitness. The program was conducted at SMP Negeri 2 Baubau and consisted of three main stages: planning, implementation through educational activities, and evaluation. The final evaluation demonstrated that educational activities integrating biological concepts with light daily physical exercise were effective in improving students' understanding of healthy lifestyles. This improvement was reflected in a 60% increase in students' scores from the pre-test to the post-test. These results indicate that the community engagement program successfully enhanced students' understanding of concepts related to health and physical fitness. Furthermore, the program not only provided educational benefits for students but also strengthened collaboration between the higher education institution and the partner school.

Keywords: Biofit School, Health, Fitness, Biological Concepts

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INTRODUCTION

Physical health and fitness are important factors in supporting students' growth, development, and academic achievement (Nidya et al., 2024). Junior high school students are in early adolescence, a phase characterized by rapid physical (Izzani et al., 2024), hormonal, emotional (Atiqah et al., 2024), and social changes (Suryana et al., 2022). These changes require a good understanding of how to maintain a healthy, fit body capable of engaging in learning activities optimally. Preliminary observations, supported by interviews with randomly selected students at the partner school, revealed that most students did not regularly engage in physical activity or exercise at home beyond the activities provided by the school. The interviews also indicated that students tended to spend a substantial proportion of their free time using digital devices rather than participating in physical activities. These preliminary findings suggest a relatively sedentary lifestyle among the students, characterized by limited engagement in regular physical activity and considerable time spent using digital devices. However, in daily life, many students still do not understand the relationship between the human body's systems, dietary

patterns, physical activity, rest, and overall health. As a result, sedentary habits, an unbalanced diet, insufficient rest, and low awareness of physical fitness are still commonly found among school-age adolescents.

Physical fitness is not only related to a person's ability to engage in sports but is also closely linked to the functioning of the body's organ systems, such as the respiratory system, circulatory system, muscular system, skeletal system, digestive system, and nervous system (Rini & Lontoh, 2021). From a biological perspective, the human body functions as a single, interconnected system. When students engage in physical activity, their muscles require energy derived from the metabolism of nutrients; the respiratory system supplies oxygen; the circulatory system transports oxygen and nutrients; and the nervous system regulates movement coordination (Handayani et al., 2024). By understanding these concepts, students not only recognize that exercise is important but also grasp the biological reasons why physical activity, a balanced diet, and adequate rest are necessary for maintaining physical health..

The World Health Organization (WHO) reports that more than 80% of children and adolescents worldwide do not meet the recommended physical activity guidelines, which call for at least one hour of moderate-to-vigorous physical activity each day (Sujarwo, 2023). The World Health Organization (WHO) reports that more than 80% of children and adolescents worldwide do not meet the recommended physical activity guidelines, which call for at least one hour of moderate-to-vigorous physical activity. This situation has the potential to lead to increased rates of obesity, metabolic disorders, and mental health issues among children and adolescents (Musfira et al., 2025). Health issues among adolescents are not only caused by a lack of physical activity but also by an unbalanced diet (Napitupulu et al., 2026). During their growth period, students require adequate nutritional intake to support tissue formation, brain development, immune function, and the energy needed for learning and daily activities. A balanced diet for school-aged children must be achieved through a variety of foods tailored to the body's needs based on age, gender, and health status (Desfita et al., 2023). Therefore, physical fitness education for middle school students should be integrated with biological concepts relevant to daily activities..

On the other hand, technological advancements and lifestyle changes have led students to engage in more passive activities, such as sitting for long periods, using electronic devices, watching videos, or studying without sufficient physical activity. These conditions can increase the risk of poor physical fitness, postural problems, being overweight, decreased concentration while studying, and weakened immunity. The World Health Organization (WHO) emphasizes that children and adolescents aged 6–17 need to be physically active for at least 60 minutes each day. These 60 minutes or more per day should consist of moderate- to vigorous-intensity aerobic physical activity at least 3 times a week and should also include muscle-strengthening activities (Kemenkes, 2026). Therefore, schools play a strategic role as venues for health education that not only emphasize knowledge but also foster the adoption of active and healthy lifestyles.

The community service activity titled “Biofit School: Biology-Based Health and Physical Fitness Education for Junior High School Students” was designed as an effort to improve students' health literacy through a biological approach. The term “Biofit” describes a combination of “biology” and “fitness”—that is, an understanding of physical fitness based on the biological functioning of the human body. **Biofit School** is an educational initiative that

integrates concepts from biology and physical activity to promote health awareness among school-aged children. The term *Biofit* combines “bio,” representing biology, and “fit,” referring to physical fitness and exercise, while “school” indicates the primary setting and target population of the program. This initiative is based on the premise that school-aged children need adequate knowledge and understanding of how their daily activities are associated with biological processes and health outcomes. Such education is increasingly important given the growing prevalence of health problems among school-aged children, particularly those associated with physical inactivity and unhealthy lifestyles. Therefore, **Biofit School** is designed as an integrative educational program that combines biological knowledge with concepts of physical activity and exercise in the context of students’ everyday lives. Through this approach, students are expected to better understand the relationship between their daily behaviors, physical activity, bodily functions, and overall health, thereby encouraging the development of healthier and more active lifestyles.. Through this activity, students are expected to understand that maintaining physical fitness is not only a requirement in physical education classes but also part of applying biological science to everyday life. This activity is important because middle school students are in a strategic age group for establishing long-term healthy lifestyle habits. Habits formed during adolescence—such as regular physical activity, a balanced diet, good personal hygiene, adequate sleep, and understanding the body’s signals—can lay the foundation for healthy behavior well into adulthood. Furthermore, biology-based education can help students understand health from a scientific perspective, rather than simply following recommendations without knowing the reasons behind them. This community service initiative also serves as a form of support for the government’s program—specifically SDG Goal 3, known as the “Good Health and Well-being” goal (Sekretariat Nasional SDGs, 2025).

This activity aims to 1) improve students’ understanding of physical fitness and health through the teaching of biological concepts, and 2) instill healthy lifestyle habits through exercise to maintain physical health and fitness.

METHOD

This Community Service (PkM) activity was held at Baubau Public Junior High School No. 2 in June 2026 and was attended by 25 students. The activity consisted of several stages, as shown in the following figure.



Figure 1. Stages of Implementing Community Engagement Activities

The details of the activity implementation stages are as follows:

1. Planning is the initial stage related to preparing for the activity. At this stage, the community service team coordinates with the school regarding the theme of the activity to be carried out and the implementation schedule.
2. Implementation is the next stage in the community service activity. At this stage, the team conducts educational sessions on physical fitness and health based on biological concepts. The presenters use educational materials in the form of posters containing information on the relationship between the body's systems, nutrition, physical activity, and health, as well as activities to maintain fitness and healthy lifestyle habits. This activity also directly involves students through question-and-answer sessions and discussions.
3. Evaluation is the final stage of the activity. This activity aims to determine the extent to which the program's established objectives have been achieved, as assessed through a test on the material that has been presented. To assess the improvement in students' understanding, evaluations were conducted before and after the educational intervention using pre-test and post-test assessments.

RESULT AND DISCUSSION

A community service activity themed "Biofit School: Biology-Based Health and Physical Fitness Education for Junior High School Students" was held as an effort to improve students' knowledge, understanding, and awareness of the importance of maintaining health and physical fitness based on biological concepts relevant to everyday life. The target audience for this activity is junior high school (SMP) involved a total of 25 students in the early stages of adolescence—a period marked by significant biological, physiological, and psychological changes that require a proper understanding of healthy lifestyles.

The implementation of the activity begins with planning, which also serves as the preparation stage, involving coordination with the school regarding the theme and schedule for the activity. In this stage, the outreach team also develops learning media to be used and educational posters regarding the activity material and evaluation tools. The material is compiled using a contextual approach so that students can connect biological concepts with their daily activities.

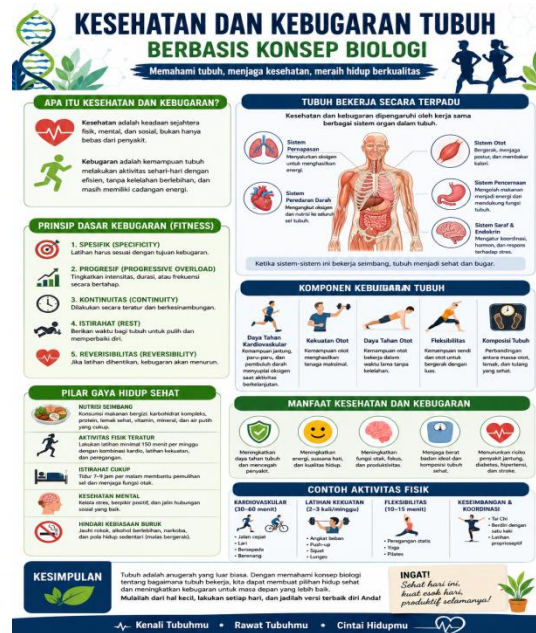


Figure 2. Activity Material Poster

During the implementation phase, participants attended presentations, participated in interactive discussions, and completed learning assessments. The material covered included the structure and function of organ systems involved in physical activity, the importance of a balanced diet, energy metabolism, age-appropriate physical activity, and the relationship between lifestyle and long-term health, with posters used as learning aids. Posters were chosen as a learning tool because they can convey information visually and engagingly, making them an effective medium for enhancing students' understanding of and interest in the material (Utami et al., 2024).



Figure 2. Submission of Material by the Team

Throughout the presentation, participants demonstrated high enthusiasm, as evidenced by their active participation in the question-and-answer session, their ability to answer probing questions, and their active engagement during the simulation of pulse rate measurement before and after light physical activity. Most participants were able to explain the relationship between an increased heart rate and the body's oxygen during physical activity. This understanding indicates that the students are beginning to integrate concepts of human physiology with the firsthand experiences they gained during the activity. The pre-test administered prior to the

educational intervention showed that 22 out of 25 students obtained scores below 50, indicating limited initial understanding of the concepts assessed. Following the educational intervention, students demonstrated a notable improvement in their understanding, with 18 students achieving scores above 70 on questions related to the material provided. This indicates that students' conceptual understanding increased by 60 percentage points following the educational intervention.. These findings suggest that the educational intervention contributed positively to improving students' knowledge and understanding of the concepts presented.

The educational activities also provided an understanding of the importance of physical activity as part of the biological mechanisms that maintain organ function. Participants learned that exercise is not only intended to increase muscle strength but also helps improve lung capacity, cardiac efficiency, energy metabolism, hormone regulation, and maintain the balance of the immune system. Through this understanding, students began to view exercise as a biological necessity, rather than merely an obligation to participate in physical education classes. Interactive discussions also demonstrated that students find it easier to grasp biological concepts when they are linked to issues they face in their daily lives, such as getting tired quickly during exercise, frequently eating fast food, not drinking enough water, or the habit of using smartphones late into the night.

The final evaluation of the activity showed that most participants were able to restate the material presented in their own words. This suggests that the community service activity effectively improved students' conceptual understanding of health and physical fitness. It also benefited the students and strengthened collaboration between the university and the school. In addition, the educational posters created by the outreach team can serve as supplementary learning materials, helping sustain the program even after the outreach activities have concluded.

Nevertheless, the program's implementation still faced some limitations. The relatively short duration of the program meant that some topics could not be discussed in greater depth. The evaluation also focused primarily on improving knowledge and was not yet able to measure long-term changes in participants' health behaviors. Overall, the Biofit School activity demonstrates that biology-based health education is an effective approach for improving health literacy among junior high school students. Integrating biological theory with simple practical activities helps build a deeper understanding of the relationship between the body's structure, function, and mechanisms and healthy lifestyle habits.

CONCLUSION

The final evaluation of the activity showed that most participants were able to restate the material presented in their own words. Most participants were able to restate the material presented in their own words. This indicates that this community service activity has successfully improved students' conceptual understanding of health and physical fitness. This community service activity not only benefited the students but also strengthened collaboration between the university and the school.

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