

The Effect of Sports Modifications and Mini Games to improve students' physical fitness in the Adaptive Physical Education Course

El efecto de las modificaciones deportivas y los minijuegos para mejorar la condición física de los estudiantes del curso de Educación Física Adaptativa

*Yuni Astuti, *Erianti, Dina Amsari, *Dessi Novita Sari

*Universitas Negeri Padang (Indonesia)

Resumen. Este estudio tiene como objetivo determinar si existe un efecto de las modificaciones de los deportes y juegos en la mejora de la condición física de los estudiantes. Este tipo de investigación es una investigación cuantitativa con un modelo experimental. La población de este estudio fueron estudiantes que tomaron el curso de educación física adaptativa en el semestre de julio a diciembre de 2022. La técnica de muestreo utilizó una técnica censal con un total de 90 estudiantes. Además, la prueba t se utiliza para el análisis de datos. Con base en los resultados de las pruebas con diferentes muestras, se muestra que la variable aptitud física en el valor pretest del grupo experimental y del grupo control tiene un valor t de 1.048 y un valor de significancia de $0.204 > 0.05$, lo que indica que no existe diferencia significativa entre el valor promedio de los resultados de la prueba previa del grupo experimental y los resultados de la prueba previa del grupo de control en las variables de aptitud física. Mientras tanto, las puntuaciones post-test para el grupo experimental y el grupo control tuvieron un valor t de 7,69 y un valor de significancia de 0,000, lo que indica que hubo una diferencia significativa en la variable condición física entre los resultados promedio post-test para el grupo experimental y el grupo control. Grupo experimental y los resultados posttest del grupo control. Con base en los hallazgos del estudio, es posible concluir que las modificaciones en los deportes y juegos tienen un impacto significativo en el aumento de la aptitud física de los estudiantes.

Palabras clave: modificaciones de deportes y juegos; nivel de condición física

Abstract. This study aims to determine whether there is an effect of sports and game modifications in improving students' physical fitness. This type of research is quantitative research with an experimental model. The population in this study were students taking adaptive physical education course in July – December 2022 semester. The sampling technique used a census technique with a total of 90 students. Furthermore, the t-test is used for data analysis. Based on the test results with different samples, it is shown that the physical fitness variable in the pretest value of the experimental group and the control group has a t-value of 1.048 and a significance value of $0.204 > 0.05$, indicating that there is no significant difference between the average value of the experimental group's pretest results and the control group's pretest results on physical fitness variables. Meanwhile, the post-test scores for the experimental group and the control group had a t-value of 7.69 and a significance value of 0.000, indicating that there was a significant difference in the physical fitness variable between the average post-test results for the experimental group and the posttest results for the control group. Based on the study's findings, it is possible to conclude that sports and game modifications have a significant impact on increasing students' physical fitness.

Keywords: sports and game modifications; physical fitness level

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Yuni Astuti

yuniastuti@fik.unp.ac.id

Introduction

Adaptive Physical Education is a compulsory course for students enrolled in the Physical Education, Health and Recreation Study Program. This course covers the fundamental principles and nature for children with special needs, along with the reasons which lead to extraordinary (disorders) to occur and the types and features of children with special needs. Furthermore, students are equipped with knowledge and diverse learning and learning experiences through physical activity, as a result of modifying and developing adaptive physical education learning media that are adapted to the characteristics of children with special needs, and this can be applied in the physical education learning process in Special Schools.

Physical education is an educational process that uses movement activities to improve students' physical, mental, and emotional well-being (Kruger et al., 2022; Santamaria & Lafuente, 2023). Beside that, physical education is an essential component of overall education with the goal of developing aspects of physical fitness, movement skills, social skills, reasoning, emotional stability, critical thinking skills,

moral action, patterns of healthy living, and the introduction of a clean environment through physical activity (Aartun et al., 2022; Manuel et al., 2023). Physical education in schools plays a significant function in allowing students to be directly involved in a variety of learning activities through physical activity (Del Val Martín et al., 2023; Fenanlampir et al., 2021). The process of learning activities is designed to promote improved physical and psychological development, as well as the establishment of a healthy and fit lifestyle. Physical education, can be used to combat obesity in addition to being healthy for the body and can help reduce obesity (Schwefel et al., 2023; Louk & Sukoco, 2016). This means that physical education plays a significant role in maintaining physical fitness and body health (Afacan & Afacan, 2021; Li et al., 2022).

According to some of the aforementioned opinions, physical education is a physical activity that involves movement skills, critical thinking skills, social skills, reasoning, emotional stability, moral action, aspects of a healthy lifestyle, and the introduction of a clean environment through physical activity, sports, and health, in order to achieve national education goals through physical education in

schools. The physical exercises provided above are simple to perform for those who do not have defects in body shape or physical, mental, or emotional abnormalities, but not everyone is in ideal physical, mental, or emotional shape since many people still have limits in all three areas. These types of situations are experienced by youths who have restrictions or require special care, and who are commonly referred to as students with special needs in modern society (García-González et al., 2023; Siquier-coll et al., 2023; Tornero-Aguilera et al., 2021).

Adaptive physical education is a physical activity for persons with impairments that includes movement skills, sports games both individually and in groups, water activities, dance games, and fitness. Meanwhile, adaptive physical education is a component of education in general as a type of education that aims to improve a student's ability to fulfill educational goals through physical movement activities (Sukriadi, 2021; Pelana et al., 2020; Hardiyono et al., 2021). According to Taufan et al (2018), adaptive physical education is a way of educating through a physical exercise that is tailored to the needs of children in order to promote physical and psychological growth and development for the entire kid. Adaptive physical education is one of the motion learning programs developed to provide programs for individuals with special needs (Vierhauser et al., 2023). Meanwhile, American Psychiatric Association (2013) and Ekawati et al. (2021) suggests that adaptive physical education is an educational process that is consciously and systematically carried out through various physical activities to gain increased ability in physical skills, growth, intelligence, and thinking maturity. Adaptive physical education is designed for students who have specific needs or who have physical or psychological problems (Darden et al., 2022; Tarigan, 2018). It is believed that adapted physical education would assist students with disabilities in achieving optimal physical, mental, emotional, and social growth and development (Fraser et al., 2023; Li et al., 2022; Schwefel et al., 2023). Furthermore, adaptive physical education can assist children with special needs in developing self-awareness so that they can develop optimally and contribute to the larger community.

Adaptive physical education is defined as "education through adapted or modified physical activity that allows individuals with special needs (disabled) to participate or get the opportunity to do activities safely and successfully (within their limitations) and obtain satisfaction" (Murdi-ono et al., 2022). Meanwhile, Suwandari et al. (2022), Alfarisi & Hasanah (2021) and Utomo et al. (2020) state that the goal of adaptive physical education is to help those with disabilities reach their full physical, mental, emotional, and social potential through a carefully designed physical activity program. Specific goals include: (1) Assisting students in improving repairable conditions; (2) Supporting students in protecting themselves and any conditions that can worsen their condition through physical activity; and (3) Providing opportunities for students to learn and participate in a variety of sports and recreational physical activities. (4) Helping students to comprehend their physical and mental

limitations, (5) Guiding students in making social changes and creating sentiments of self-worth, (6) Assisting students in developing understanding and respect for proper body mechanics, (7) Helping students in understanding and appreciating numerous sports that he can enjoy as a spectator (Bile et al., 2021; Dan & Colleagues, 2023; Prayoga et al., 2022).

Plenty of individuals associate sports with exercise or physical activity. Every movement someone makes will result in a variety of rewards if he exercises regularly. It does not consider him to be normal or needed in this environment. Everyone, both students with special needs and those who are typically developing can learn and benefit from any physical activity they participate in; however, these benefits will be maximized if the instructor or student knows for certain how to adapt and modify to the demands they require. Apart from being healthy and fit and according to Er-iant E., (2011), Pelana et al., (2020) and Najib et al., (2022), adaptative physical education provides the following benefits:

- Physical benefits imply that via planned and conducted adaptive physical education exercises, the growth of muscle tissue and bones is fostered, hence improving the physical condition of pupils. Furthermore, it can help to develop and maintain physical strength, endurance, flexibility, and mobility, resulting in an optimal level of fitness.
- Movement Skills Benefits suggest that sports in various types of movements or games help improve movement skills, and creative sports teachers can help each student develop neuromuscular coordination, in movement skills, through the creative motion someone does.
- Emotional Benefits represent that in adaptive physical education learning, students are taught to respect differences and tolerate a variety of conditions; with the teacher's guidance, students can be directed to be able to master their emotions by adhering to previously agreed-upon game rules.
- Cognitive Benefits convey that methods and tactics in each game demand cognitive abilities and that thinking is required every time a physical education game can benefit students' intellectual growth.

Achieving the objectives of adapted physical education requires learning that is modified in the form of provided sports and games to students with special needs in these special schools. As a result, all students in the Physical Education, Health, and Recreation Study Program must have knowledge of and practice directly with modified game models in order to be able to teach in a special needs school later during their period of field education practice or later after graduation. All students practice all of the games that have been modified for children with special needs during the adaptive physical education lectures. Children with special needs (Heward) are children who have qualities that distinguish them from other children without always displaying mental, emotional, or physical problems. Blind, deaf, people or children with intellectual disability, quadriplegic, mentally challenged, learning challenges, behavioral issues,

gifted children, and children with health concerns are among those covered by the child with special needs.

It is crucial for the writers that physical education teachers are aware of the modification of physical education learning. It is expected that they will be able to explain the definition and concept of modification, what is modified, and how to alter it, as well as the name and explain many parts of modification analysis. The physical education program's execution should match the program's qualities, notably "Developmentally Appropriate Practice" (DAP). It means that the teaching assignments must pay attention to changes in the child's ability or condition and can help push for these adjustments. Thus, instructional tasks must be calibrated to the students' levels of development and maturity. The development or maturity in question includes physical, psychological, and skills. One of the efforts that teachers can do to ensure that learning runs smoothly is sports modification and it is utilized as an alternate technique in physical education learning (Damayanti & Rahayu, 2018). In addition, sometimes children become bored easily with the activities in their surroundings, but the Physical Education teacher continues with the same learning model and children get bored easily with the same two things, but this is due to the instructor's innovation (Pungki, 2018). Physical education can help to adapt learning.

Playing is an activity related to the child's whole aspect. When children play, they practice skills that are important for their cognitive development, linguistic development, psychomotor development, and physical development. The experience of playing will inspire children to think critically and creatively. When children play, they experience happiness when they win, disappointment when they lose, enthusiasm and self-discipline because they want to win the game, work hard to maintain victory, be fair to retain friendship, and honesty to always be accepted in the team. Thus, playing has the potential to improve all dimensions of children's learning outcomes. Playing activities have provided several benefits, but some people still have limited awareness of what they are. It occurs when some individuals believe that youths who play too much would become lethargic to learn, resulting in their low intellectual ability.

Mini-games and sports modification share actions that create cognitive, psychomotor, and affective elements. Sport modification, on the other hand, results in sports with altered rules. Mini-games are generally played in one's leisure time and have various recreational aspects. Mini-games can be created as a result of ideas, customs, and culture in the surrounding area. Teachers must make adjustments in their teaching and learning activities (Coulter & Ní Chróinín, 2011; Safruddin et al., 2021). It is incredibly beneficial to teachers during the teaching and learning process. By making changes, the physical education instructor should be able to offer complicated subject material more readily and easily, without fear of losing significance or given meaning. Children will be able to move more freely in a variety of changed scenarios and environments. According to Kusmiyati's research (2013), developing adapted

models for mini volleyball games such as passing for Physical Education learning in elementary schools results in an effective product that improves students' physical fitness. Essentially, game modification improves the quality of learning in overcoming educational limits with the following characteristics: 1) based on the child's abilities (age, physical fitness, health status, skill level, and prior experience); 2) safe to play; 3) has a variety of criteria such as the weight and shape of the equipment, the field of play, the playing duration or length of the game, the rules, the number of participants, the rotation or position of the players; 4) develop players and important sports skills that can be utilized as a foundation for future coaching (Listyarini, 2014; Suharta, 2007).

Physical fitness, according to Irianto (2002), is a person's physical ability to carry out daily work efficiently without causing excessive fatigue, so that he can still enjoy leisure time; in other words, physical fitness can also be defined as the ability to carry out tasks properly even in severe conditions when a person with less physical fitness might fail. Furthermore, Physical Fitness is often known as fitness or physical fitness. Physical fitness is highly important and in line with the needs of students who are constantly faced with a full schedule of class activities, because increasing physical fitness will be able to give significant physical endurance. A person with a high level of physical fitness will have the strength and endurance to carry out daily activities without being overly exhausted. Lutan (2001) continues to say in his book that the components of physical fitness that are associated with health are the capacity of physical fitness, muscle strength, muscle endurance, flexibility, and body composition. Activities such as dance, gaming, sports, and gymnastics have relevance in the subject of physical education since they can be utilized as ideas for developing and requiring movement skills. The purpose of physical fitness is to improve everyone's creative talents and endurance, which is beneficial for improving work strength (Langhamer et al., 2018; Ohuruogu, 2016).

This research was conducted to improve students' physical fitness in the Adaptive Physical Education Course. Based on existing theory and several previous research results, the following hypothesis could be formulated

Ho : There was no a significant influence of modified sports and mini games on increasing students' physical fitness in adaptive physical education courses

Ha : There was a significant influence of modified sports and mini games on increasing students' physical fitness in adaptive physical education courses.

Method

This study is quantitative research, and if the researcher needs to obtain a description of the data that is purposely generated, the research takes the form of an experiment. According to the causative model, this research involves the Longitudinal model, which means researching different stages of growth by following advances for the same indi-

viduals (Arikunto, 2015). In the Pretest-Posttest Control Group Design, two groups are randomly selected and then given a pretest to see if there is a difference in the beginning state of the experimental group and the control group. This study included 90 students who studied adaptive physical education classes during the July-December 2022 semester aged 18 - 22 years old . Furthermore, the variables used include independent variables, such as sports modifications and mini-games, and dependent variables, such as physical fitness level. Meanwhile, the data collection instrument used practical test in the form of Indonesian physical fitness test. Instrument test are used, which include: 1) a 60-meter sprint and 2) a 60-second hanging body lift. 3) lying down and sitting for 60 seconds, 4) jumping straight up, and 5) running a 1200-meter medium distance. Furthermore, the paired sample t-test is used for data analysis. Prior to performing the the paired sample t-test, the data must be tested for homogeneity and normality.

Research Results and Discussion

The findings of this study's analysis will be linked to the research objectives stated at the outset, so they can be described with a description of the data and testing. Data calculations were performed using the SPSS 21 (Statistical Package For Social Science). The pretest group's physical fitness variable data from 90 students yielded the highest score of 23 and the lowest score of 10. While the range (measurement distance) of the student's physical fitness data

on SPSS 21 calculations with the test provisions, Ho is accepted and Ha is rejected if the significant value of the calculated p-value is less than 5% or 0.05. Meanwhile, if the calculated Pvalue's significant value is greater than 5% or 0.05, Ha is accepted and Ho is rejected. Based on the results of the previously described data, the pretest and posttest significance values for the physical fitness variable in the experimental and control groups were greater than 0.05, indicating that the data was normal and suitable for further research. The homogeneity test is used to determine whether a set of data is homogeneous or heterogeneous. Based on the table above, the pretest and posttest significance values for the physical fitness variable in the experimental and control groups are higher than 0.05, indicating that the data is homogeneous and feasible for future research.

To determine whether there are paired or related mean differences, the same-sample difference test is used. The results of the various sample tests revealed that the experimental group's variable physical fitness had an average pretest of 15.45 and an average posttest of 19.20, with a t-value of 2.26 and a significance value of 0.043 So it can be concluded that modifying sports and mini-games had an effect on the experimental group. Meanwhile, in the control group, the students' physical fitness variable had an average pretest of 14.60 and a posttest of 14.33, with a T value of 1.000 and a significance value of 0.334 > 0.05. Consequently, because the control group did not receive treatment, it is possible to conclude that there was no effect. The different sample test compares the average results of samples that are not paired with one another. This was accomplished by using a different test for the experimental group's pretest scores and the control group's pretest values, as well as a different test for the experimental group's posttest scores and the control group's posttest scores. According to the test results of different samples, the physical fitness variable, the pretest value of the experimental group and the control group has a T value of 1.048 and a significance value of 0.304 > 0.05, indicating that there is no significant difference between the average value of the experimental group's pretest results and the pretest results of the control group on physical fitness variables.

Meanwhile, the post-test scores for the experimental group and the control group had a t value of 6.969 and a significance value of 0.000, implying that there was a significant difference in the physical fitness variable between the average post-test results for the experimental group and the posttest results for the control group. The results of the next analysis are a percentage analysis. The percentage increase analysis is used to determine what percentage of the increase is after treatment. Physical fitness increased by 5% in the experimental group. In contrast, there was no increase in the control group. It is consistent with the findings of Kardiawan (2013), who used traditional sports training to improve body physical fitness. Physical Education is a lesson that students are looking forward to learning. Aside from that, there are various types of activities in sports learning, one of which is sports modification and mini-

Table 1. Frequency Distribution of Physical Fitness Levels

Interval Class	Category	Pretest		Post-test	
		Absolute Frequency	Relative Frequency	Absolute Frequency	Relative Frequency
22 - 25	Excellent	15	16.67	24	26.67
18 - 21	Good	17	18.89	20	22.22
14 - 17	Fair	22	24.44	22	24.44
10 - 13	Poor	26	28.89	15	16.67
5 - 9	Very Poor	10	11.11	9	10.00
Total		90	100.00	90	100

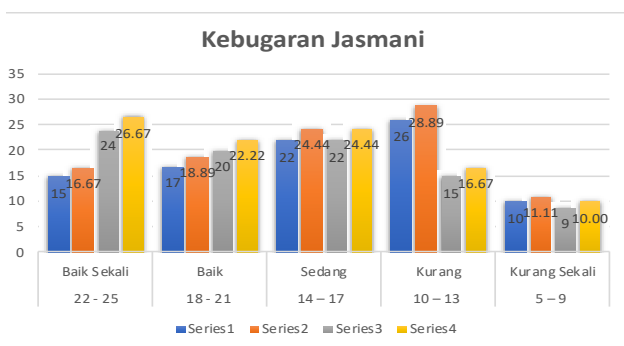


Figure 1. Histogram of Physical Fitness Test Results

Furthermore, the data normality test was performed to determine whether the data being analyzed is normally or not normally distributed, so that the Shapiro-Wilk method can be used because the sample size is less than 50. Based

games, which are also sports that must be done during the physical education learning process at school. It is hoped that this will improve the physical fitness of children with special needs.

Hence, physical education is education that improves student fitness. It will become an interesting lesson by modifying sports and mini-games so that students will be motivated to participate in sports and have healthy physical education later on. According to the findings of a study on the effect of sports and mini-game modifications on physical fitness, it is clear that sports and mini-game modifications can improve students' physical fitness. The percentage increase in physical fitness is 5%, as can be seen. There was no increase in the value of students' physical fitness in the group that did not receive treatment.

Conclusions

Based on the outcomes of researchers' studies and data analysis, it is possible to conclude that sports modification and mini-games have an effect on student physical fitness. It is proven by the acquisition of values stating that the impact of traditional sports games on student physical fitness has a significance value of 0.043, indicating that there is a significant effect after modifying sports and mini-games. Students' physical fitness increased in the experimental group but not in the control group. Thus, it is possible to conclude that sports modification and mini-games have a significant impact on the physical fitness of students enrolled in the Physical Education, Health, and Recreation Study Program. Because these findings are significant, the more frequently sports and mini-games are modified, the higher the level of physical fitness of students. More modifications to effective sports and mini-games are required to improve physical fitness, of course, with regular and routine adjustments in each lesson, the more the intensity increases, the better the results of student physical fitness are obtained. The following suggestions can be made in response to the research findings: 1) for lecturers to be able to provide innovation and motivation in conducting learning so that students are not bored participating in learning, 2) for students to be able to take part in adaptive physical education learning with high enthusiasm so that the value of physical fitness is achieved and later can be applied when in the field, namely training schools or teaching places, 3) for researchers to be able to provide information about sports modifications and mini-games and the level of physical fitness of students

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