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Improving Physical Fitness through a Circuit Games Model

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Abstract: This study aims to determine how effectively these circuit games can enhance physical fitness among young students and whether this approach can lead to measurable improvements in their overall physical health and capabilities**.** This study employs the action research method to assess the impact of circuit games on improving student fitness. By observing changes in student behavior and physical capabilities, the researcher aims to determine the effectiveness of the circuit game model in enhancing overall fitness. The TKSI (Test Kebugaran Siswa Indonesia) is used as a key tool to measure and evaluate the students' fitness levels throughout the study. Through this approach, the study seeks to provide insights into how circuit training games can be effectively utilized to boost physical fitness among students. The results stated that physical fitness is a crucial asset for students, as it significantly enhances their ability to perform daily activities and tasks efficiently. Students with good physical fitness are generally better equipped to handle the demands of both academic and extracurricular activities, while those with lower fitness levels often struggle with fatigue and difficulty in daily tasks. Circuit training games offer a dynamic approach to fitness, combining aerobic exercises with strength training and flexibility. These games involve various stations, each designed to target different aspects of physical fitness, and require students to complete each station within a set time before moving on to the next.

Keywords: Action Research Method, Circuit Games, Physical Fitness

A. Introduction

Physical education is a learning process through physical activities designed and arranged systematically to improve physical fitness, motor skills, knowledge and behavior of healthy and active living, sportsmanship, and emotional intelligence (Jafar et al., 2023). Meanwhile, according to Green et al. (2018), physical education is also a process of human growth and development that lasts a lifetime. It is also one of the important tools to stimulate human growth and development because physical education is closely related to human movement (Chambers & Sandford, 2019). According to Lleixà & Nieva (2020) and (Hinojo Lucena et al., 2019), physical education is integral to the educational process, especially in primary school. Sports

education is a conscious and systematic process conducted through various physical activities to achieve physical growth, health, and physical fitness. Physical fitness is the ability of a person to do daily work efficiently without excessive fatigue and enjoy their leisure time (Kaur et al., 2020). Physical fitness is the ability of the body to carry out daily activities without experiencing significant fatigue.

Physical fitness can be interpreted as the ability of the body to carry out daily activities without experiencing significant fatigue (Dasso, 2019). Physical fitness is commonly defined as the ability to carry out daily tasks with vigor and alertness, without undue fatigue, and with ample energy to enjoy leisure-time pursuits and to meet unforeseen emergencies. It encompasses a variety of components, including cardiovascular endurance, muscular strength, flexibility, and body composition (Nuzzo, 2020). Maintaining physical fitness is crucial for overall health and well-being, as it can reduce the risk of chronic diseases, improve mental health, and enhance quality of life (Marquez et al., 2020). In this paper, we will explore the importance of physical fitness and discuss strategies for achieving and maintaining optimal levels of fitness. We will also examine the benefits of regular exercise and proper nutrition in promoting physical fitness. By understanding the importance of staying active and taking care of our bodies, we can make informed choices that lead to a healthier and more fulfilling life.

Additionally, we will provide practical tips and resources to help individuals incorporate fitness into their daily routines and overcome common barriers to staying active. By prioritizing physical fitness, we can improve our overall health and well-being, leading to a happier and more productive life (Søvold et al., 2021). Based on the above view, it is clear that a low level of physical fitness will have an impact on daily activities. This is very influential if a student experiences a low level of physical fitness or less, then he will be constrained in the teaching and learning process so that it will result in the achievement of learning achievement. Conversely, people who have good physical fitness will be able to do activities or physical loads faced in everyday life and still leave energy to fill spare time. According to Nieman & Wentz (2019) several components in physical fitness are forms of improving physical fitness.

Physical fitness consists of several components according to Haqiyah et al. (2020) , namely cardiovascular endurance, muscle endurance, muscle strength, flexibility, body composition, speed of movement, agility, balance, reaction speed and coordination. Of the 10 components, health experts argue that the endurance component is the most important component in determining a person's physical fitness. According to the Ministry of Education, Culture, Research, and Technology of Indonesia, the components of physical fitness include: 1) Cardiovascular endurance, 2) Muscle endurance, 3) Muscle strength, 4) Flexibility, 5) Body composition, 6) Speed of movement, 7) Agility, 8) Balance, 9) Speed of reaction, 10)

Coordination. The Indonesian Student Fitness Test (TKSI) is the physical fitness test package developed by the Research Center for Education Ministry of Education, Culture, Research, and Technology of Indonesia. This test measures students' physical fitness levels. Physical fitness phase a tests for primary students are sit and reach test to measure flexibility, Besaki Test (Standing Balance Test) to measure static balance, Latangkap Test to measure hand-eye coordination, Laboba Test to measure agility, and Jari Test (Multi-Stage Fitness Test) to measure cardiovascular endurance (heart and lungs). Marino et al. (2022) endurance is the ability of the athlete's organism to overcome fatigue that arises after exercising the body for a long time. Endurance can be interpreted as physical quality (heart, circulatory and respiratory systems) that makes a person able to carry out continuously a fairly heavy physical labor without feeling tired prematurely (Cheng et al., 2019; Mileva & Zaidell, 2022).

Physical fitness is a crucial aspect of student life, serving as a foundational asset that significantly impacts their ability to engage in and excel at various activities and academic tasks (McDavid et al., 2020). Students who maintain high levels of physical fitness are generally better equipped to handle the physical demands of their daily routines (van Sluijs et al., 2021). This includes participating in sports, engaging in outdoor activities, and maintaining concentration during classroom learning. The benefits of physical fitness extend beyond just physical health; they also contribute to mental well-being and cognitive performance (Marquez et al., 2020). Fit students often exhibit increased energy levels, better mood regulation, and enhanced concentration, which collectively enhance their academic performance and social interactions. Conversely, students with lower levels of physical fitness often struggle with fatigue, diminished enthusiasm, and a lack of energy, which can negatively impact their academic and social performance (Chen & Qin, 2024).

Fatigue can lead to decreased attention and focus in the classroom, making it difficult for students to retain information and engage actively in learning activities (Hlas et al., 2019; Peper et al., 2021). Additionally, a lack of physical fitness can reduce participation in physical and social activities, leading to feelings of isolation or decreased self-esteem. Thus, promoting physical fitness in schools is essential not only for improving students' physical health but also for enhancing their academic and social development. Schools can play a pivotal role in fostering a culture of fitness by integrating physical activities into the daily routine, encouraging participation in sports, and educating students about the benefits of maintaining an active lifestyle (Mavilidi et al., 2018). By prioritizing physical fitness, educators can help students develop lifelong healthy habits that support their overall well-being and success in various aspects of life.

This issue is particularly evident among younger students, such as those in Year 2 of primary school, where early signs of physical unfitness can manifest through quick exhaustion during outdoor exercises and a noticeable lack of interest or motivation

in repetitive learning tasks. The background of this study highlights the urgent need to assess and improve the physical fitness levels of these students. The current state of physical fitness among Year 2 primary students remains largely undetermined, and there's a clear gap in knowledge regarding how effectively targeted interventions, such as circuit training, can enhance their fitness levels. Furthermore, it is essential to understand that physical fitness extends beyond external appearances or physical capabilities; it deeply influences how students feel internally, affecting their mental and emotional well-being. A well-rounded approach to physical fitness, therefore, should not only focus on building strength and endurance but also on fostering a positive self-image and emotional resilience, ensuring that students not only look fit but also feel strong, confident, and capable from within.

It is important to remember that physical fitness is not just about the way we look on the outside, but also about how we feel on the inside. Regular exercise can help boost our mood, reduce stress and anxiety, and improve our cognitive function (Mandolesi et al., 2018). In addition, eating a balanced diet rich in nutrients can support our immune system, improve digestion, and promote healthy aging. Prioritizing our physical health can have a ripple effect on all aspects of our lives, leading to a greater sense of well-being and vitality. By making physical fitness a priority, we are investing in our long-term health and happiness. Not only does exercise help prevent chronic diseases such as heart disease and diabetes, but it also enhances our overall quality of life. When we take care of our bodies, we are better equipped to handle life's challenges and enjoy all the activities and experiences that bring us joy. So, let's lace up our sneakers, grab some fruits and vegetables, and start prioritizing our physical fitness for a happier and healthier future.

Regular exercise has been shown to improve mood, reduce stress, and boost cognitive function (Mandolesi et al., 2018). It can also help us sleep better and increase our energy levels throughout the day. When we prioritize physical fitness, we are not only benefiting our bodies, but also our minds and overall well-being. Making time for regular exercise is a powerful way to take control of our health and create a more fulfilling and vibrant life. Let's commit to making physical fitness a non-negotiable part of our daily routine, and watch as our health and happiness soar to new heights. By incorporating exercise into our daily lives, we are setting ourselves up for success in all aspects of our life. Whether it's going for a run, hitting the gym, or practicing yoga, finding a form of physical activity that we enjoy can make a world of difference in how we feel both physically and mentally. So let's lace up our sneakers, grab our yoga mats, or dust off our weights and make a commitment to ourselves to prioritize our health and well-being through regular exercise. The benefits are endless, and the rewards are truly life-changing. Let's take the first step towards a brighter, healthier future today.

Games combined with a physical fitness agenda can effectively motivate students to consciously achieve physical fitness, as games provide an engaging way to incorporate exercise into their routines. Unlike rigid fitness programs, games offer a more flexible and enjoyable approach, with rules and objectives that encourage participation and effort without imposing external pressures. Circuit games, specifically, are structured exercise methods that involve multiple stations, each with a distinct activity designed to target different aspects of physical fitness (Feito et al., 2018). In this study, circuit games are utilized as a method to enhance students' physical fitness. The circuit comprises three game stations: Lompat Karet, Balance Relay Race, and Dragons Tail. Each station is designed to focus on different elements of physical fitness such as agility, balance, and coordination—thereby providing a comprehensive approach to physical development.

By participating in these varied activities, students engage in a diverse range of exercises that collectively contribute to improved fitness levels. The research will examine the impact of this circuit game model on the physical fitness of second-grade students at SD Cikal Lebak Bulus. The study aims to determine how effectively these circuit games can enhance physical fitness among young students and whether this approach can lead to measurable improvements in their overall physical health and capabilities. Circuit games offer a compelling and enjoyable method for enhancing physical fitness while maintaining high levels of engagement. This approach integrates a variety of exercises and activities into a circuit format, allowing participants to simultaneously develop strength, endurance, flexibility, and coordination within a single session.

The dynamic and fast-paced nature of circuit games makes them an ideal choice for individuals who may find traditional workouts monotonous or who prefer a more interactive fitness experience. As highlighted by Martin-Niedecken et al. (2020), circuit games are particularly effective because they keep participants interested and motivated through continuous movement and variety. The format allows for constant activity, ensuring that there is never a dull moment and that participants remain engaged throughout the session. Additionally, the circuit model provides opportunities for participants to challenge themselves by gradually increasing the intensity or duration of each exercise. This progressive approach not only helps in achieving fitness goals but also fosters a competitive spirit among participants, encouraging them to push their limits and realize their potential. The blend of fun and functional training in circuit games can lead to significant improvements in physical fitness, making it a versatile and effective option for individuals seeking both enjoyment and progress in their fitness journey.

The literature review on the effectiveness of circuit training for physical fitness has shown promising results, with many studies highlighting the positive impact it can have on strength, endurance, and overall health (Mendonça et al., 2022).

Incorporating games into fitness routines has also been found to increase motivation and engagement, leading to better adherence and results (Höchsmann et al., 2019). When compared to traditional fitness programs, the circuit games model has been shown to be more enjoyable and sustainable, making it a popular choice for individuals looking to improve their physical fitness. Additionally, the competitive aspect of circuit games can make exercising more fun and stimulating, encouraging participants to push themselves harder and reach new fitness goals. The variety of exercises and activities within a circuit game workout also helps to prevent boredom and plateaus, keeping the body constantly challenged and improving overall fitness levels. Overall, the circuit games model offers a well-rounded and effective approach to physical fitness that appeals to a wide range of individuals seeking a fun and engaging workout experience. Additionally, the social aspect of working out in a group setting can provide a sense of camaraderie and support, making the experience even more enjoyable. Overall, the circuit games model offers a comprehensive and enjoyable approach to improving physical fitness for individuals of all levels.

B. Methods

This study employed action research within classroom settings, utilizing the Kemmis and Taggart model, which is renowned for its systematic approach to fostering educational improvement. The action research procedure, as outlined by this model, is divided into four distinct stages within a single cycle: planning, acting, observing, and reflecting. In the planning stage, educators and researchers collaboratively design a strategic plan to address identified issues or improve specific areas of learning. During the acting stage, the planned interventions are implemented in the classroom setting, where educators apply new strategies or techniques aimed at enhancing student engagement and learning outcomes. The observing stage involves systematically collecting data and monitoring the effects of these interventions on students' behavior, performance, and overall classroom dynamics. Finally, in the reflecting stage, the collected data and observations are thoroughly analyzed, and insights are drawn to evaluate the effectiveness of the implemented actions. This reflection informs the planning of the next cycle, facilitating a continuous process of improvement and adaptation to optimize teaching practices and student learning experiences.

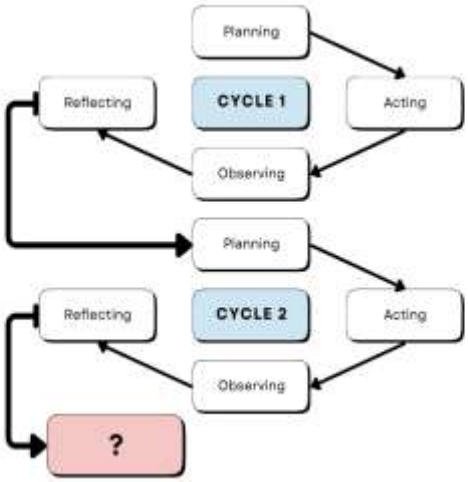

Figure 1. Action Research

This study is designed with two distinct cycles, Cycle I and Cycle II, which are implemented to achieve the desired success in research, particularly focusing on ensuring that at least 75% of Year 2 primary students attain TKSI scores categorized as moderate, good, or excellent. Action researchers frequently refer to this comprehensive action research model due to its effectiveness in facilitating continuous improvement. In this model, the activities of action and observation are intricately intertwined and carried out simultaneously, creating a dynamic process of evaluation and adaptation. Both the teacher and the researcher play active roles in conducting observations aimed at detecting changes in student behavior, learning engagement, and overall performance. The data and insights gathered from these observations are meticulously analyzed and reflected upon, serving as a crucial foundation for planning the subsequent stage of action. This cyclical process of action, observation, reflection, and planning is repeated iteratively, allowing for continuous refinement and enhancement of teaching strategies and learning outcomes. The cycle persists in this manner until the researcher reaches a point of satisfaction, where the initial problem has been resolved, and the improvement in learning outcomes has reached an optimal level, indicating that further enhancements are either unnecessary or would not yield significant additional benefits.

C. Results and Discussion

The researchers employed the classroom action method to conduct observations, systematically gathering data on student performance across various assessments. The findings from the observations in Cycle I revealed mixed results. For the TKSI Test, the assessment met the success criteria, achieving a total percentage of 75% across moderate, good, and excellent categories, which aligns with the research goals. However, the KAKU Test results fell short of expectations, with only 36% of

students achieving moderate, good, or excellent criteria, indicating a significant gap from the desired research success criteria. Similarly, the BESAKI and JARI Tests also did not meet the success criteria, with 61% and 67% of students, respectively, falling into the moderate, good, or excellent categories. These percentages indicate progress but still highlight the need for further improvement to reach the established goals. In contrast, the LATANGKAP and LABOBA Tests successfully met and exceeded the research success criteria, with percentages of students achieving moderate, good, and excellent criteria reaching 81% and 94%, respectively. These results demonstrate substantial achievement and suggest that the strategies implemented in these areas were effective in enhancing student performance.

The reflection on Cycle I indicates that the aspects of flexibility, static balance, and cardiovascular endurance have not yet met the established success criteria, highlighting areas in need of improvement. To address these weaknesses and enhance the success criteria related to child development observed in Cycle I, the researcher recognized the need for further refinement and re-planning of the approach. As a result, the researcher is developing the next cycle, focusing on strategic adjustments and interventions aimed at improving these specific aspects. The goal of the new cycle is to implement targeted strategies that will effectively address the shortcomings identified in Cycle I, ensuring that the students achieve the desired developmental outcomes. Through this iterative process, the researcher aims to foster continuous growth and progress in students' physical capabilities, ultimately achieving the research's success criteria.

Table 1. Observation results for cycle 1 and 2 test

TKSI Stage A	Moderate, Good and Excellent Criteria		Very Poor and Poor Criteria	
	Cycle I	Cycle II	Cycle I	Cycle II
KAKU Test	36%	75%	64%	25%
BESAKI Test	61%	97%	39%	3%
LATANGKAP Test	81%	86%	19%	14%
LABOBA Test	94%	97%	6%	3%
JARI Test	67%	92%	33%	8%

The findings from the Cycle II observation reveal significant improvements across various assessments. For the TKSI Test, the success criteria were met, with a total of 75% of students achieving moderate, good, and excellent categories for each test conducted, maintaining the progress seen in Cycle I. Notably, the KAKU Test showed a substantial increase, reaching 75% in the moderate, good, and excellent categories, reflecting a marked improvement from Cycle I. Similarly, the BESAKI and JARI Tests demonstrated impressive gains, with 97% and 92% of students, respectively, achieving moderate, good, and excellent criteria, indicating a significant improvement from Cycle I, where these tests had not met the research success criteria. The LATANGKAP and LABOBA Tests also showed positive growth, with percentages increasing to 86% and 97%, respectively, in the moderate, good, and excellent categories. These results suggest that the adjustments and

strategies implemented in Cycle II were effective in enhancing student performance and meeting the research's success criteria.

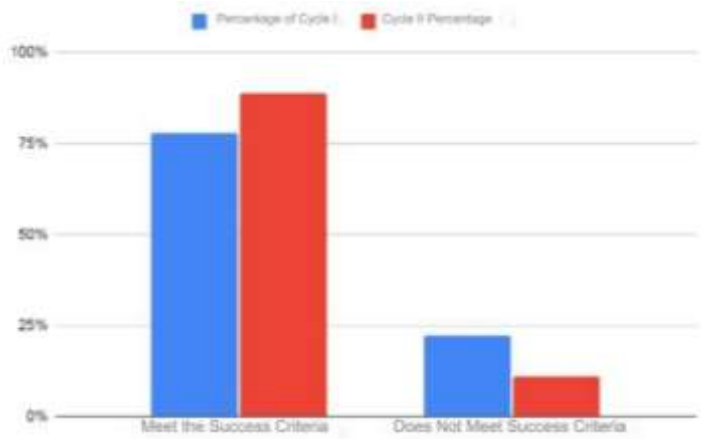

Figure 2. Comparison of TKSI Score Percentages Cycle I and II

The criteria for success concerning the final TKSI score were initially established at a benchmark of 78% in Cycle I. This percentage served as a foundational reference point for evaluating the effectiveness of the intervention strategies implemented to enhance students' physical fitness. The goal was to achieve a satisfactory level of improvement by increasing this percentage in Cycle II, reflecting advancements in student performance and overall fitness outcomes. Observations from Cycle II revealed a significant increase in the TKSI score, which rose to 89%. This notable improvement demonstrates that the interventions and strategies applied between the two cycles were successful in addressing the areas identified as needing enhancement. The rise from 78% in Cycle I to 89% in Cycle II signifies a substantial gain, highlighting the effectiveness of the refined teaching methods and engagement practices.

This improvement is indicative of a well-executed adaptation of the initial strategies, where the changes made between cycles contributed to better student performance. The increase in the TKSI percentage underscores the positive impact of the circuit game model and the targeted interventions designed to address specific aspects of physical fitness. The adjustments implemented in Cycle II were aimed at refining the approach based on the insights gained from the first cycle, focusing on areas that required further development to meet the established success criteria. The process of enhancing student fitness through circuit games involved a meticulous evaluation of the initial results from Cycle I, which revealed certain gaps and areas for improvement. For example, tests such as the KAKU, BESAKI, and JARI showed lower percentages of students meeting the success criteria, indicating that additional efforts were necessary to boost performance in these areas. The reflection phase highlighted weaknesses in flexibility, static balance, and cardiovascular endurance, prompting the researcher to re-plan and adjust the approach for Cycle II.

This iterative process of reflection, adjustment, and re-implementation is a hallmark of action research, allowing for continuous improvement and refinement based on real-time data and observations. In Cycle II, the revised strategies were carefully designed to address the identified weaknesses and build on the progress made in the first cycle. The introduction of targeted interventions, enhanced activities, and improved instructional methods were integral to achieving the improved TKSI score. The increase in the percentage of students meeting the moderate, good, and excellent criteria across various tests, including KAKU, BESAKI, JARI, LATANGKAP, and LABOBA, reflects the effectiveness of these adjustments. Notably, the substantial rise in the percentage for the KAKU Test, from 36% in Cycle I to 75% in Cycle II, and similar gains in other tests, demonstrates that the changes made had a meaningful impact on student fitness.

The significant improvement in the overall TKSI score from 78% to 89% between cycles is a clear indication of the success of the implemented strategies. This increase not only meets but exceeds the initial research goals, illustrating that the circuit game model was effective in enhancing students' physical fitness. The success of the intervention can be attributed to the well-planned and executed changes made in Cycle II, which were informed by the reflective process from Cycle I. The positive outcomes achieved in Cycle II underscore the importance of ongoing evaluation and adaptation in educational research, particularly when aiming to improve student performance and fitness. In conclusion, the significant rise in the TKSI score from Cycle I to Cycle II demonstrates the effectiveness of the circuit game model and the targeted interventions implemented between cycles. The successful adaptation of teaching methods and engagement practices, coupled with a strategic focus on addressing identified weaknesses, led to improved physical fitness outcomes for the students. This outcome highlights the value of action research in refining educational approaches and achieving desired results, providing a solid foundation for further exploration and application of effective fitness interventions in educational settings.

D. Result and Discussion

The discussion of the findings from Cycle I and Cycle II of the classroom action research reveals several key insights into the effectiveness of the circuit game model in enhancing student physical fitness. In Cycle I, the results were mixed, with some tests meeting the success criteria while others fell short. Specifically, the TKSI Test achieved the success benchmark with 75% of students reaching moderate, good, and excellent categories, which was encouraging and aligned with the research goals. However, other tests such as KAKU, BESAKI, and JARI did not meet the success criteria, highlighting areas for improvement. The KAKU Test, in particular, had only 36% of students meeting the criteria, suggesting a significant gap that needed

addressing. Although there was some progress, as seen in the LATANGKAP and LABOBA Tests where 81% and 94% of students respectively achieved the desired outcomes, the overall performance indicated that more focused interventions were necessary.

The reflection on Cycle I identified specific areas of weakness, including flexibility, static balance, and cardiovascular endurance. This led to the development of a revised approach for Cycle II, aimed at addressing these shortcomings. The new cycle involved strategic adjustments and targeted interventions designed to improve these areas of physical fitness. The results from Cycle II demonstrated notable improvements. The percentage of students achieving moderate, good, and excellent categories increased significantly in the KAKU Test, reaching 75%, which marked a substantial improvement from Cycle I. Similarly, the BESAKI and JARI Tests showed impressive gains, with 97% and 92% of students, respectively, meeting the criteria. The LATANGKAP and LABOBA Tests also saw positive growth, with scores rising to 86% and 97%, respectively. These improvements suggest that the refinements made between the cycles were effective in enhancing student performance. The overall increase in the TKSI score from 78% in Cycle I to 89% in Cycle II further underscores the success of the interventions. This 11% improvement reflects the positive impact of the revised strategies and the effectiveness of the circuit game model in promoting physical fitness. The higher score indicates that the adjustments made in Cycle II successfully addressed the weaknesses identified in Cycle I and contributed to achieving the research goals.

In conclusion, the iterative process of action research proved valuable in refining the approach and enhancing student fitness. The significant improvements observed in Cycle II validate the effectiveness of the circuit game model and highlight the importance of ongoing evaluation and adaptation in educational research. The study underscores the potential of circuit games to improve physical fitness among students, suggesting that similar approaches could be beneficial in other educational settings.

E. Conclusions

Based on classroom action research conducted in two cycles in class II of SD Cikal Lebak Bulus in the second semester of the 2023-2024 school year, it appears that the use of circuit games significantly improves students' physical fitness. The study involved 19 female and 17 male students, and aimed to measure the impact of the circuit game model on aspects of physical fitness, including flexibility, static balance, and cardiovascular endurance, as measured through various fitness tests. In Cycle I, the percentage of success for the flexibility aspect of the KAKU Test only reached 36%, indicating that most students were still below the set success criteria. However, in Cycle II, there was a significant improvement with the percentage of success

rising to 75%. This indicates that the interventions conducted between cycles were successful in substantially improving students' flexibility. This improvement indicated that the strategies implemented in the circuit game were effective in improving flexibility and enabled students to achieve better results in this test.

In addition, the BESAKI Test, which initially only reached 61% in Cycle I, increased dramatically to 97% in Cycle II. This change indicates that the use of circuit games can improve students' static balance, which is an important component of physical fitness. Similarly, the JARI Test showed an increase from 67% in Cycle I to 92% in Cycle II, signaling a significant improvement in another aspect of students' physical fitness. The LATANGKAP and LABOBA tests also showed improvement, although not as much as the other tests. The LATANGKAP test increased from 81% in Cycle I to 86% in Cycle II, while the LABOBA test increased from 94% to 97%. Although the increase was smaller, it was still evident that circuit games had a positive impact on students' ability to maintain balance and coordination. Overall, the improvements seen in these fitness tests were reflected in an increase in the total TKSI score, which increased from 78% in Cycle I to 89% in Cycle II, showing an overall increase of 11%. These results show that circuit games are an effective method to improve students' overall physical fitness. The consistent improvement across different aspects of fitness shows that this method does not improve only one aspect of fitness, but has a broad positive impact on students' overall physical fitness.

In conclusion, this study confirmed that the circuit game model can be effectively applied to improve students' physical fitness in elementary schools. With a fun and interactive approach, circuit games are able to encourage students to actively participate in physical activities, which in turn improves their fitness. The improvement seen from Cycle I to Cycle II shows that adaptation and improvement of teaching strategies between cycles is crucial in achieving the desired results. Thus, this study provides valuable insights for educators in designing learning activities that promote physical fitness among young students, as well as demonstrating the potential use of circuit games as an effective tool in physical education.

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