

Efforts to Improve the Agility of Sixth-Grade Students at SDN Pangkatrejo Through the Traditional Game of Gobak Sodor

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ABSTRACT

This research is motivated by the importance of developing basic motor skills and physical components, particularly agility, in elementary school students through effective and enjoyable Physical Education, Sports, and Health learning activities. The lack of traditional game usage and the suboptimal stimulation of agility in Physical Education learning underline the need for learning intervention methods based on local wisdom. This study aims to determine whether the application of the traditional game gobak sodor can increase the agility of sixth-grade students at SDN Pangkatrejo. This research employs a quantitative approach with an Action Research method. The research subjects consisted of 23 sixth-grade students at SDN Pangkatrejo. The instrument used to measure the students' agility levels before (pre-test) and after (post-test) the treatment was the Illinois Agility Run Test. The treatment, in the form of a structured practice program and gobak sodor game activities, was administered for one month from April 14 to May 16, 2026. Data analysis techniques used were descriptive statistical analysis and the Wilcoxon Signed Ranks Test for. The results indicated a significant increase in student agility. The mean travel time for student agility decreased from 20.2435 seconds during the pre-test to 17.2004 seconds during the post-test. The Wilcoxon Signed Ranks Test showed a Z-value of -4.198 with an Asymp. Sig. (2-tailed) significance value of 0.000. Thus, it can be concluded that the application of the traditional game gobak sodor is significantly proven to increase the agility of sixth-grade students at SDN Pangkatrejo. The traditional game gobak sodor can be recommended as an effective and enjoyable alternative learning medium in PJOK to enhance students' physical fitness components.

Keywords: Agility, Traditional Games; Gobak Sodor; Illinois Agility Run Test; Physical Sport Education

Authors' Contribution: a – Study Design; b – Data Collection; c – Statistical Analysis; d – Manuscript Preparation; e – Funds Collection

INTRODUCTION

Physical Education, Sports, and Health (PJOK) plays a crucial role in supporting students' physical, cognitive, affective, and social development, particularly at the elementary school level. At this stage, physical activity serves as the foundation for developing basic motor skills while enhancing components of physical fitness, one of which is agility. Agility is an individual's ability to change the direction of movement quickly and accurately without losing balance, making it an important component in various sports and daily activities (Windarto, 2020). PJOK instruction designed through physical activities tailored to students' characteristics has been shown to improve physical fitness while supporting students' cognitive and affective development (Siddik et al., 2024).

However, advances in digital technology have changed the activity patterns of elementary school-aged children. Children tend to spend more time using electronic devices than engaging in physical activity, resulting in fewer opportunities to develop gross motor skills. This situation has led to a decline in physical fitness levels, including agility. On the

other hand, physical education instruction in schools is still dominated by conventional teaching models that do not sufficiently utilize games that are active, enjoyable, and aligned with children's developmental characteristics. Therefore, there is a need for instructional innovations that can increase students' physical activity while creating an engaging learning environment.

One learning alternative that can be implemented is through the traditional game of Gobak Sodor. This game requires players to move quickly, change direction suddenly, maintain balance, and work together as a team. These movement characteristics align with the elements of agility training, such as changes of direction, acceleration, deceleration, coordination, and body balance (Elfarita et al., 2025). In addition to improving biomotor skills, traditional games also contribute to the preservation of local culture and the development of students' social skills through group play (Maryuni & Nasrulloh, 2022).

Gobak Sodor is a traditional game that has emerged from local culture; it can also be described as a folk game that has grown and evolved throughout the regions of the Indonesian archipelago. Traditional games typically involve human interaction (socializing) and a connection with the natural environment (Risma, 2020). Gobak Sodor is a team game that requires players to move nimbly, think quickly, and cooperate effectively with teammates to achieve victory. These aspects align closely with the learning objectives of Physical Education (PJOK), particularly in enhancing agility (Elfarita et al., 2025). Agility is a key component of physical fitness and is essential for all activities that require rapid changes in body position and the movement of specific body parts (Rifai, 2025).

In terms of biomechanics, agility is not merely the ability to run fast, but rather the body's capacity to change direction nimbly without losing balance a skill that relies heavily on coordination between the central nervous system and visual perception of surrounding stimuli. It is this characteristic of movement that serves as the primary driving force in the traditional game of Gobak Sodor. On the Gobak Sodor field, every player whether on offense or defense is constantly faced with dynamic situations that require feints, instant acceleration, sudden deceleration, and changes in direction in order to break through the opponent's defensive line or, conversely, to chase down the attacker. This series of explosive movements, performed repeatedly within spatial constraints, physiologically stimulates the development of intermuscular coordination in elementary school-aged students (Bawazir et al., 2024).

The close relationship between this game and improved motor fitness is reinforced by the fact that the structure of Gobak Sodor incorporates conventional agility training principles, such as the shuttle run and the zig-zag run. As the defenders move laterally in a straight line along the running line and the attackers look for gaps in the space both vertically and horizontally, the students bodies are forced to rapidly contract the muscle fibers in their legs to respond to their opponents movements. Through the repetition of competitive, enjoyable, and structured game patterns, Gobak Sodor is not merely a recreational activity but a medium for physical stimulation that effectively trains children's dynamic agility (Elfarita et al., 2025).

However, in practice, the use of traditional games such as Gobak Sodor in physical education classes in schools remains relatively limited. This is due to various factors, such as the dominance of modern games or the limited experience of physical education teachers in integrating traditional games into the curriculum.

Given this background, the researcher is interested in conducting a more in-depth study on the effectiveness of using the Gobak Sodor game as an alternative teaching method to improve the agility of elementary school students. This study is expected to contribute to the development of a Physical Education (PJOK) learning model that is more contextual, engaging, and relevant to local culture.

METHODS

In this study, the author employed a quantitative approach using the Action Research method; therefore, this study is classified as Action Research aimed at describing interventions to improve the agility of sixth-grade students at SDN Pangkatrejo. Action Research (AR) is a method that explains the cause-and-effect relationship of a learning intervention on students through a cycle-based mechanism consisting of the stages of planning, implementation, observation, and reflection (Ryansari, 2023). The research design began with a pre-test using the Illinois Agility Run Test to measure baseline abilities, followed by an intervention in the form of the traditional game “gobak sodor,” and concluded with a post-test using a similar instrument to measure students’ agility levels after the intervention (Nuhad Hanin & Anna Noordia, 2024). The cycle in this study can be described as follows:

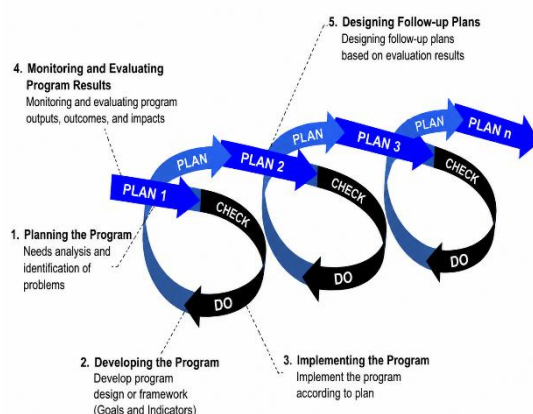


Figure 1. Action Research Cycle (Source: Sriundy, 2010)

This study was conducted at SDN Pangkatrejo over a four-week period from April to May 2026, consisting of a total of eight sessions. The study participants included all 23 sixth-grade students at SDN Pangkatrejo for the 2025–2026 school year. The independent variable in this study was the traditional game Gobak Sodor, while the dependent variable was the students’ level of agility.

Data collection was carried out in three stages: a pre-test during the first session, the treatment consisting of the traditional Gobak Sodor game—over six sessions (sessions two through seven), and a post-test during the eighth session. In addition to the primary data, supporting documentation in the form of photos and videos was also collected to reinforce the observational findings throughout the research process. Student agility was measured using the Illinois Agility Run Test to assess the ability to quickly change direction while navigating a course with eight cones. Each student was given three attempts, with the fastest time recorded as the final result. Supporting equipment used in this test included a stopwatch, cones, a whistle, a measuring tape, and a test result recording sheet. In this test, leg muscle movement may occur

during the Illinois Agility Run Test because muscles and bones function as passive or auxiliary movers, while muscles act as active movers (Rainal Hadad Faimiza Putra et al., 2025).

Table 1. Illinois Agility Run Test Scoring Form

Name	Trial 1	Trial 2	Trial 3	Best Time	Note

Table 2. Illinois Agility Run Test Procedure and Normative Data

Assessment	Men	Woman
Excellent	<15.2	<17.0
Good	16.1-15.2	17.9-17.0
Fair	17.2-16.2	21.7-18.0
Fairly Good	17.3-18.2	23.0-21.8
Poor	>18.3	>23.0

(Source: Rainal Hadad Faimiza Putra et al., 2025)

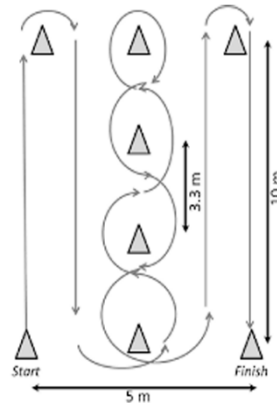


Figure 2. Illinois Agility Run Test (Source: Widhi et. al., 2023)

The data were analyzed using the Statistical Package for the Social Sciences (SPSS). The analysis began with descriptive statistics, including the minimum, maximum, and mean values, to describe the students agility before and after the intervention. Next, the Wilcoxon Signed-Rank Test was conducted to determine the differences between the pre-test and post-test results.

RESULTS

This study involved all 23 sixth-grade students at SDN Pangkatrejo and was conducted over a one month period, from April 14 to May 16, 2026. Based on the data description using the Illinois Agility Run Test instrument, the shorter the time students took to complete the agility test, the better their level of agility. A significant increase in student agility was found. Thus, this improvement was demonstrated by a decrease in completion time from the pre-test to the post-test, where a shorter completion time indicates a higher level of agility following the intervention. Before proceeding to the Descriptive Statistical Analysis and the Wilcoxon Rank-Sum Test, the subjects took the pre-test and post-test. The following are the results of the pre-test and post-test:

Table 3. Summary of Pre-test Data

Assessment	Number	Percentagae
Very Good	6	27%
Good	5	22%
Fair	9	40%
Fairly Good	1	2%
Poor	2	9%
Total	23	100%

Table 4. Post-test Data Summary

Assessment	Total	Percentagae
Very Good	-	-
Good	3	13%
Fair	7	30%
Fairly Good	6	27%
Poor	7	30%
Total	23	100%

Descriptive Statistical Analysis

The data description in this study aims to provide a description of the results of the agility improvement measurements for sixth-grade students at SDN Pangkatrejo. Agility improvement was measured using the Illinois Agility Shuttle Run Test, which was used to determine the students' agility levels. The data obtained was then analyzed descriptively by calculating the mean, minimum, and maximum values.

Table 5. Descriptive Statistics for the Agility Test

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Standard Deviation
Pre-test	23	15.64	24.41	20.2435	2.86602
Post-test	23	13.21	23.18	17.2004	2.46665
Valid N (listwise)	23				

Based on Table 5, the agility test results for the 23 sixth-grade students at SDN Pangkatrejo show that the pre-test data had a mean of 20.2435 seconds, while the post-test data had a mean of 17.2004 seconds. In the pre-test, the fastest time achieved by a student was 15.64 seconds, and the slowest time was 24.41 seconds. Meanwhile, in the post-test, the fastest time achieved by a student was 13.21 seconds, while the slowest time was 23.18 seconds.

These data indicate a change in students' agility test results after they were exposed to the traditional Gobak Sodor game. The decrease in the average completion time from 20.2435 seconds in the pre-test to 17.2004 seconds in the post-test suggests an improvement in students' agility. In agility tests, the shorter the time required to complete the test, the higher the level of agility.

Therefore, based on this data, it can be concluded that the implementation of the traditional Gobak Sodor game had a positive impact on improving the agility of sixth-grade students at SDN Pangkatrejo. This is demonstrated by the faster average post-test time compared to the average pre-test time, indicating an improvement in agility after the students participated in the intervention.

Rank Test

Table 6. Results of the Wilcoxon Test

		Ranks		
		N	Mean Rank	Sum of Ranks
posttest - pretest	Negative Ranks	23 ^a	12.00	276.00
	Positive Ranks	0 ^b	.00	.00
	Ties	0 ^c		
	Total	23		

a. *post-test < pre-test*

b. *post-test > pre-test*

c. *post-test = pre-test*

Based on Table 6, the results of the Wilcoxon test on the ranks table show that there were 23 students in the Negative Ranks category with a Mean Rank of 12.00 and a Sum of Ranks of 276.00. These results indicate that all students had lower post-test scores than their pre-test scores. Meanwhile, the Positive Ranks category yielded a value of 0, indicating that no students had post-test scores higher than their pre-test scores. Additionally, the Ties category also showed a value of 0, meaning no students had identical scores between the pre-test and post-test. Therefore, descriptively, it can be concluded that all students experienced a change in scores from the pre-test to the post-test after being exposed to the traditional Gobak Sodor game as a learning intervention. In this study, agility was measured using travel time where a shorter travel time indicates a better result so this decrease in scores indicates an improvement in the agility of sixth-grade students at SDN Pangkatrejo following the learning intervention using the traditional Gobak Sodor game.

Table 7. Ranks Test Statistics

Test Statistics ^a	
Post-test – Pre-test	
Z	-4.198 ^b
Asymptotic Significance (2-tailed)	(2-.000)

a. Wilcoxon Signed-Ranks Test

b. Based on positive ranks.

Based on Table 7, the results of the Wilcoxon Signed Ranks Test show a Z-value of -4.198 with a two-tailed Asymp. Sig. value of 0.00. These results prove that there is a significant difference between the students' pre-test and post-test agility scores. Therefore, the traditional game of gobak sodor has been proven to improve the agility of sixth-grade students at SDN Pangkatrejo.

DISCUSSION

The purpose of this study was to determine the level of improvement in the agility of sixth-grade students at SDN Pangkatrejo. Based on the results of the research data analysis, it was found that there was an increase in students' agility after the treatment, as evidenced by the pre-test and post-test scores. In the initial data presented in Table 3 (Pre-test), the agility levels of the research subjects were predominantly in the low ability category. Most students were still in the "Poor," "Fairly Good," and "Fair" categories. This indicates that prior to the Gobak Sodor game intervention, the students' gross motor skills, specifically their ability to quickly change direction and body position had not yet been optimally stimulated. Conversely, after the treatment program using the traditional Gobak Sodor game method was implemented, the data summary in Table 5 (Post-test) showed a significant shift in ability criteria. The students' ability categories improved, with the majority of students advancing to the "Good" to "Very Good" criteria and successfully eliminating the dominance of the "Poor" category that had appeared in the initial test.

This can also be seen from the mean score of the agility test using the Illinois Agility Run Test. The students' pre-test scores before being exposed to the traditional "gobak sodor" game were 20.2435 on average, with a lowest score of 24.41 and a highest score of 15.64. Meanwhile, the students' post-test scores after receiving the "gobak sodor" traditional game intervention had a mean of 17.2004, with a lowest post-test score of 23.18 and a highest score of 13.21. This difference in mean scores indicates that there was an improvement in the students' agility following the "gobak sodor" traditional game intervention.

This study is also consistent with research conducted by Affandi et al. (2025), which shows that using the "gobak sodor" game can have a positive impact on improving the agility of elementary school students. To achieve these results optimally, a structured, planned, and systematic training program is required. Appropriate training characteristics must include clear targets or objectives, as well as content tailored to the nature of the sport, with a focus on improving agility components.

In addition, research conducted by et al. (2024) also states that the traditional game of gobak sodor has an impact on improving the agility of elementary school students. Based on the results of the study, playing gobak sodor not only improves agility but also enhances many other aspects of students' development, such as motor skills, teamwork, knowledge and understanding of traditional games, and a greater enthusiasm for learning through fun methods, among others.

Sopyanudin, Risma, and Nurzaman (2024) revealed in their study that the traditional game of gobak sodor has a significant effect on improving students' agility. This was demonstrated by pre-test and post-test results, which showed an increase in agility after students participated in the "gobak sodor" game. Thus, the traditional "gobak sodor" game can serve as an effective alternative learning method for developing physical components, particularly students' agility.

Furthermore, research conducted by Erwanda and Sutapa (2023) also states that traditional games such as "gobak sodor" can play a role in improving physical components particularly agility and support the development of students' motor skills. This improvement can help students perform various daily activities more effectively, as agility and motor skills are crucial components in supporting bodily movement.

Nevertheless, based on the research findings, the majority of students showed an increase in agility after receiving the intervention. However, there were some students who only experienced a relatively modest increase in agility. This situation may be influenced by various factors, one of which is the lack of physical activity students engage in during their daily lives. A lack of physical activity can result in students' motor skills and physical development not reaching their full potential, meaning the improvement in agility they achieve is not as significant as that of students with higher levels of physical activity.

In addition to daily physical activity, the low frequency of physical activity during Physical Education (PJOK) lessons is also suspected to be a contributing factor to the underdevelopment of students' physical components. At SDN Pangkatrejo, Physical Education (PJOK) instruction during lesson delivery tends to take place more frequently in the classroom than through hands-on practical activities. This situation results in students having fewer opportunities to perform physical movements that can support improvements in agility. Therefore, although an increase in agility was observed after the intervention, the improvement among some students did not yet show optimal or significant results.

Based on the results of this study and supported by several previous studies, it can be concluded that the traditional game of gobak sodor can influence the improvement of agility among sixth-grade students at SDN Pangkatrejo. Physical education activities conducted through regular, hands-on practice on the field can improve physical components, one of which is students' agility. Therefore, the school administration needs to support the implementation of in-person physical education classes by using enjoyable learning methods for students, such as traditional games and others, as part of an effort to improve students' physical components and agility.

Based on the research findings and discussion outlined above, the researcher offers several recommendations for future research. First, future studies are encouraged to develop intervention programs by manipulating exercise variables in greater depth such as increasing volume, intensity, and duration and varying the forms of agility exercises to optimize improvements in students' physical fitness. Second, future researchers are advised to broaden the scope of the study by integrating other variables relevant to agility development, such as the effectiveness of Physical Education (PJOK) instruction, daily physical activity patterns, and students' lifestyle factors. Through this approach, it is hoped that future research will provide a comprehensive picture of the factors that influence children's physical components as a whole.

CONCLUSION

Based on the research results, it can be concluded that the implementation of the traditional Gobak Sodor game is effective in improving the agility of sixth-grade students at SDN Pangkatrejo. This improvement is demonstrated by a reduction in completion time on the Illinois Agility Run Test after students participated in lessons using the traditional Gobak Sodor game. The results of the statistical analysis using the Wilcoxon Signed-Rank Test also showed a significant difference between the pre-test and post-test results, thus supporting the research hypothesis. These findings demonstrate that the traditional game Gobak Sodor can serve as an alternative in Physical Education (PJOK) instruction capable of enhancing students' agility.

through active, enjoyable physical activities that align with the characteristics of elementary school students.

Based on the research results, schools are encouraged to support Physical Education (PJOK) instruction by providing adequate sports facilities and infrastructure and promoting the use of traditional games as part of learning activities. Physical Education teachers are advised to integrate the traditional game of Gobak Sodor into the learning process as a strategy to increase students' physical activity and agility. In addition, students are encouraged to participate more actively in sports activities, both at school and outside of school, and to adopt a healthy lifestyle so that their physical abilities can develop optimally.

AUTHOR CONTRIBUTIONS

All authors contributed to the topic selection and drafting of the article.

DECLARATION

This manuscript was prepared by the authors without the involvement of artificial intelligence in the research design, data collection, analysis, or interpretation process. The authors are fully responsible for the accuracy, originality, integrity, and overall content of the manuscript. All authors have reviewed and approved the final version of the manuscript and agree to be accountable for all aspects of the research.

TRANSPARENCY STATEMENT

Research data is available to the relevant author upon reasonable request.

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CONFLICT OF INTEREST

Related to this article publication, there were no interest conflicts.

FUNDING

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ETHICAL CONSIDERATIONS

This research was conducted in accordance with the applicable principles of research ethics to uphold academic integrity and responsibility. The entire research process, from data collection and processing through to data analysis, was carried out systematically whilst maintaining confidentiality, objectivity and respect for those involved in the research. The researcher is responsible for ensuring that all research procedures are carried out transparently and in accordance with applicable standards of scientific ethics.

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