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RESEARCH ARTICLE

"Gobak Sodor", Indonesian Traditional Game to Improve Agility of Children with Disabilities

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Abstract
The traditional game of gobak sodor is a small game whose rules can be simplified according to the conditions of the players. Agility is very important for students with disabilities as it improves their physical abilities and social interactions. The purpose of this study was to determine the effect of traditional gobak sodor games on improving the agility of students with disabilities. This research adopts a quantitative with experimental methods. The experimental design applied in this research is PreExperimental Design with one group pretest-posttest model. The intervention was conducted 16 times within 2 months. The samples of this study were 20 students with intellectual disabilities from grades 4, 5, and 6 of State Special School (SLB). The measuring instrument used to collect data in this study is an agility test, which is measured by a 4 x 10 metre alternating running test (Shuttle run) for students with disabilities. The data obtained were statistically analysed using the t-test formula. Based on the calculation of the t-test that has been carried out, it is obtained that Tscore is worth 2.239173 and Ttable is worth 1.832937. So it can be concluded that there is an effect of "Gobak Sodor", a traditional Indonesian game to improve the agility of children with disabilities State Special School (SLB) of Wiradesa, Pekalongan Regency. Based on the results of the study between the pretest and posttest, there was an increase in the agility test results of students with disabilities at the State Special School (SLB) of Wiradesa.

Keywords
Traditional Game, Gobak Sodor, İndonesian, Student Disabilities, Agility

INTRODUCTION

Play and games are crucial for children's development, serving as a foundation for cognitive, social, and emotional growth. Research indicates that play enhances creativity and problem-solving skills, allowing children to explore their environment and learn through experience (Whitebread et al., 2017). Furthermore, engaging in games fosters social interactions, teaching children essential skills such as cooperation, negotiation, and conflict resolution (De Almeida et al., 2024). Additionally, play is linked to physical development, as it encourages movement and coordination, which are vital for overall health (Shakhobiddinovna, 2024). However, the balance between structured and unstructured play is essential; while structured activities can provide specific learning outcomes, unstructured play allows for greater freedom and creativity (Martins da Silva et al., 2024). Moreover, the emotional benefits of play cannot be overlooked, as it provides a safe space for children to express feelings and cope with stress (Prado & Farias, 2023). Thus, integrating diverse play experiences is fundamental for holistic child development.

Children with intellectual disabilities experience delays in cognitive development that impact their intellectual and social functioning (Indriarti et al., 2022). Their motor development,

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including both gross and fine motor skills, is often slower compared to typically developing children (Ariani et al., 2022; Wouters et al., 2020). These children may struggle with coordination, balance, and muscle strength, which affects their ability to perform physical activities like walking, running, or grasping objects (Özkan & Kale, 2023; Zaragas et al., 2023). Additionally, they might show less motivation or initiative in engaging in physical tasks. With appropriate interventions, such as physical therapy and targeted activities, children with intellectual disabilities can improve their motor skills and gain greater independence (Pinru Phytanza & Burhaein, 2019).

Physical education for children with disabilities must refer to the characteristics of students with various limitations (Hutzler & Choresh, 2024; Majoko, 2019; Tarantino et al., 2022). It is very important to apply the right learning methods to improve their motor skills. The motion learning method applied must be able to attract the interest of students with disabilities in performing movements, so as to improve student movements (Farrell & Leung, 2024; Tarantino & Neville, 2023). By using appropriate learning methods, students will be more interested in doing movement after movement, as well as improving their physical fitness.

Small games are physical activities that involve simple games with easy-to-understand rules that can be played by small or large groups (Asnaldi & Syampurma, 2020; Junianto et al., 2023). Small games are often used in the context of physical education, training, or recreational activities to develop motor, social, and cognitive skills in participants, especially children (Amin et al., 2021; Pratama, 2022). Traditional games are simple games that are part of small games.

Traditional games play a significant role in cultural heritage and social development across various communities. Research indicates that these games not only serve as a means of entertainment but also facilitate the transmission of cultural values and social norms among generations. For instance, Morejón Calixto et al. highlight the educational benefits of traditional games, emphasizing their potential to enhance cognitive skills and promote teamwork among participants (Morejón Calixto et al., 2024). Similarly, Farahani and Mirsafi discuss how traditional games can foster community bonding and cultural identity, particularly in regions where modern influences threaten local customs (Farahani & Mirsafi, 2024). Cheong and Hussain further elaborate on the psychological benefits, noting that engagement in traditional games can reduce stress and improve mental well-being (Cheong & Hussain, 2024). However, Anshory and Sumarjo point out that the decline in participation due to urbanization poses a risk to the preservation of these games (Anshory & Sumarjo, 2024). Luchoro-Parrilla et al. advocate for integrating traditional games into educational curricula to ensure their survival and relevance in contemporary society (Luchoro-Parrilla et al., 2024). Overall, traditional games are vital for cultural continuity and community cohesion, warranting efforts for their preservation and promotion.

Gobak sodor is a traditional Indonesian game played by two teams, with the main objective being to cross lines guarded by the opposing team. The game is played on a rectangular field divided into sections by horizontal and vertical lines. One team is in charge of keeping the opponents from crossing the lines, while the other team tries to cross all the lines from front to back, then back again without being touched by the guards (Manihuruk et al., 2022; Puspitasari et al., 2022). This game not only hones agility and speed, but also cohesiveness and strategy in organising team movements (Ansharudin et al., 2022).

The traditional game of gobak sodor is a small game whose rules can be simplified according to the conditions of the players (Karimah et al., 2021). Based on the results of the study, traditional games are proven to improve children's motor development, both gross motor and fine motor (Phytanza et al., 2023; Sutini, 2018). The results of other studies (Erwanda & Sutapa, 2023) that the development of gobak sodor playmat products has proven effective in improving the gross motor skills of children aged 5-6 years.

Agility is very important for students with disabilities as it improves their physical abilities and social interactions. Research shows that agility training, such as plyometric programmes, significantly improves agility, speed and social engagement among students with disabilities, demonstrating the effectiveness of inclusive physical education strategies (Stefanica et al., 2024). Moreover, agile methodologies in developing digital learning ecosystems for students with disabilities ensure user-centred designs that cater to their unique needs, promoting better rehabilitation outcomes (Aguilar Carlos et al.,

2024). Additionally, research shows a positive relationship between agility and balance in athletes with disabilities, suggesting that improving agility can also improve overall coordination and physical stability (Mustafa et al., 2014). Thus, fostering agility not only supports physical development but also enriches social interactions and overall quality of life for students.

State Special School (SLB) of Wiradesa, Pekalongan Regency has 6 classes with an average of 20 students in each class. Most of the students have down syndrome. Based on the observation, students still have difficulties in performing physical movements, especially agility. It takes time for students to understand the speed of movement and respond to each instruction given. The purpose of this study was to determine the effect of traditional Indonesian games, namely gobak sodor on the agility of students with disabilities at State Special School (SLB) of Wiradesa.

MATERIALS AND METHODS

This research has met ethical rules. Research ethical approval was obtained from the UPGRIS Research Ethics Committee with project number 075/LPPM-UPGRIS/VII/2024.Participant provided informed consent, with the volunteer form covering research details, risks, benefits, confidentiality, and participant rights. The research strictly adhered to the ethical principles of the Declaration of Helsinki, prioritizing participant's rights and well-being in design, procedures, and confidentiality measures.

Type and Design

This research adopts a quantitative method, which is an approach that focuses on collecting and analysing data in numerical form (Little et al., 2024). This study uses a research design with experimental methods. Experimental research is one of the most effective methodologies for researchers. The experimental design applied in this research is PreExperimental Design with one group pretest-posttest model (Norman & Fraenkel, 2009). This research procedure begins with conducting an initial test (pretest), then followed by a final test (posttest) to evaluate changes in the condition of the sample that has received the intervention. Intervention method is a research approach in which researchers apply an action or treatment (intervention) to a specific sample group. The goal is to observe and measure the effects or changes that occur in the sample due to the intervention provided (Cousin & Rui, 2011). The intervention was conducted 16 times within 2 months at State Special School (SLB) of Wiradesa, Pekalongan Regency. The population that became the subject of this study were students of State Special School (SLB) of Wiradesa, Pekalongan Regency. The Stratified Random Sampling method was used to select samples in this study. Stratified Random Sampling is a sampling method in which the population is first divided into homogeneous subgroups or strata based on certain characteristics (Nguyen et al., 2019). The samples of this study were 20 students with intellectual disabilities from grades 4, 5, and 6 of State Special School (SLB) of Wiradesa, Pekalongan Regency.

Research Instruments

Research requires measuring instruments to collect the data needed. In this study, what will be measured is agility using the 4 x 10 metre shuttle run test.

Instruments or measuring instruments in research are devices or tools used to collect the necessary data (Salmia, 2023). The measuring instrument used to collect data in this study is an agility test, which is measured by a 4 x 10 metre alternating running test (Shuttle run) for students with disabilities. The procedure for implementing this shuttle run test involves participants who must run between the prepared stakes for 10 metres 4 times back and forth. After that, the researcher will record the time it takes for participants to complete one series of shuttle runs. The research data was collected twice, namely during the pre-test and post-test. In the final stage, the research data was analysed using a t-test to identify mean differences between samples (Norman & Fraenkel, 2009).

Data Collection Technique

In the data collection process, the information collected includes the results of the initial measurement test and the results of the final measurement test. Shuttle run is a type of fitness test that measures a person's agility, speed and endurance. In this test, participants run back and forth between two points that are a certain distance apart, usually 10 metres, as fast as possible (Dangi, 2019). In the implementation of this shuttle run test, participants must try to achieve the fastest possible time. That is, the less time it takes to complete a series of shuttle runs, the better the level of agility.

Data Analysis Technique

The data obtained were statistically analysed using the t-test formula. Interpretation of the results of the t-test is done by comparing the calculated t

value (t score) with the t value found in the t table (t table) at a significance level of 5% and degrees of freedom (dk) = N - 1. If t score is greater than t table, then H0 is rejected and H1 is accepted, which means there is an effect of small games on the agility of students with intellectual disabilities.

RESULTS

This research was conducted State Special School (SLB) of Wiradesa, Pekalongan Regency. The research was conducted from January 2 to July 30 with 12 meetings. The subjects in this study were students in grades 4, 5 and 6 of State Special School (SLB) of Wiradesa, Pekalongan Regency, totaling 20 students consisting of 14 boys and 6 girls.

The description of research data serves to facilitate reading of research data. The description of the research data includes pretest data and posttest data from the research conducted. In this chapter, the research data will be presented one by one, from pretest data and posttest data of traditional Gobak Sodor games to improve the agility of students with disabilities in grades 4, 5 and 6 State Special School (SLB) of Wiradesa, Pekalongan Regency. The following is a description of the data obtained:

$$\bar{x} = \frac{\sum xi}{n}$$

$$= 37.031$$

$$s = \sqrt{\frac{1}{N-1} \sum_{i-1}^{N} (xi - \bar{x})^2}$$

$$= 4.55$$

From the total data obtained 32 from the pretest and posttest, the minimum value is 31, the maximum value is 46 the mean is 37.03 and the standard deviation is 4.55. After that, calculate the value obtained in the pretest and posttest.

Student Agility Level During Pretest

The pretest data description is based on data obtained from the measurement test results at the time of the pretest or before treatment. The results of descriptive analysis of pretest data of traditional Gobak Sodor games to improve the agility of State Special School (SLB) of Wiradesa students in Pekalongan Regency obtained a maximum Personal best (best time record) of 46, minimum value of 32, mean 37.43, median 36.5, mode 32, and standard deviation value of 4.53. The following is the frequency distribution table.

Table 1. Frequency distribution of pretest

No.	Class Interval	Frequency	Percentage
1.	32 - 34	7	36,50%
2.	35 - 37	2	18, 45%
3.	38 - 40	4	16,25 %
4.	41 - 43	3	14,0%
5.	44 - 16	4	14,5%
Total		20	100%

Based on the table above, it can be seen that most of the students with disabilities at State Special School (SLB) of Wiradesa, Pekalongan Regency during the pretest. In detail, there were 7 students (36.50%) in the 32-34 class interval, 2 students (18.45%) in the 35-37 class interval, 4 students (16.25%) in the 38-40 class interval, 3 students (14.0%) in the 41-43 class interval and 4 students (14.5%) in the 44-46 class interval. If summarized in the form of a histogram, then the following is a histogram of the pretest data frequency distribution data.

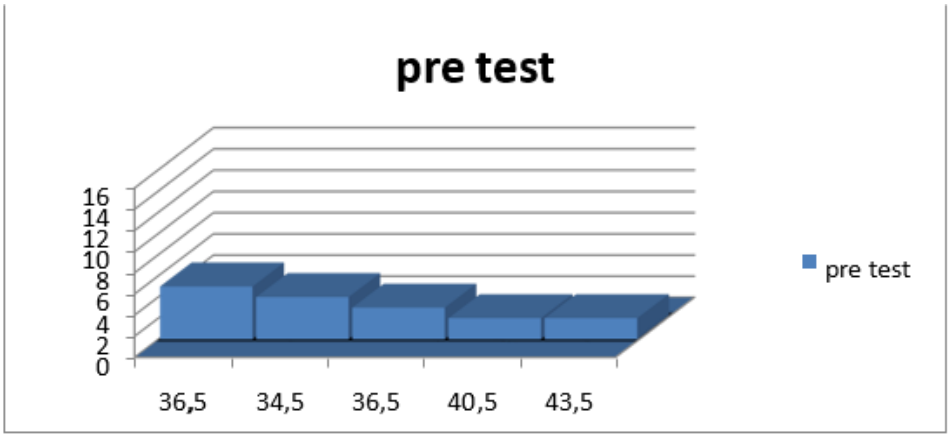

Figure 1. Pretest histogram

Student Agility Level At Posttest

The description of posttest data is based on data obtained from the measurement test results at the time of the posttest. The results of descriptive analysis of posttest data of traditional Gobak Sodor games to improve the agility of students with disabilities at State Special School (SLB) of Wiradesa, Pekalongan Regency obtained a minimum Personal best (best time record) of 31, a maximum value of 49, an average of 38.18, a median of 38.5, a mode of 33, and a standard deviation value of 6.27. The following is the frequency distribution table

Table 2. Frequency Distribution of posttest

No.	Total Value	Frequency	Percentage
1.	31 - 33	4	18%
2.	34 - 36	4	37,75%
3.	37 - 39	2	15,25 %
4.	40 - 42	4	14,50%
5.	43 - 45	6	14,50%
Total		20	100%

Based on the table above, it can be concluded that most of the students with disabilities at State Special School (SLB) of Wiradesa, Pekalongan Regency experienced changes during the posttest. In detail, 4 students (18%) from the 31-33 class interval, 4 students (37.75%) in the 34-36 class interval, 2 students (15.25%) from the 37-39 class interval, 4 students (14.50%) in the 40-42 class interval, and 6 students (14.50%) in the 43-45 interval. If summarized in the form of a histogram, then the following is a histogram of the pretest data frequency distribution data.

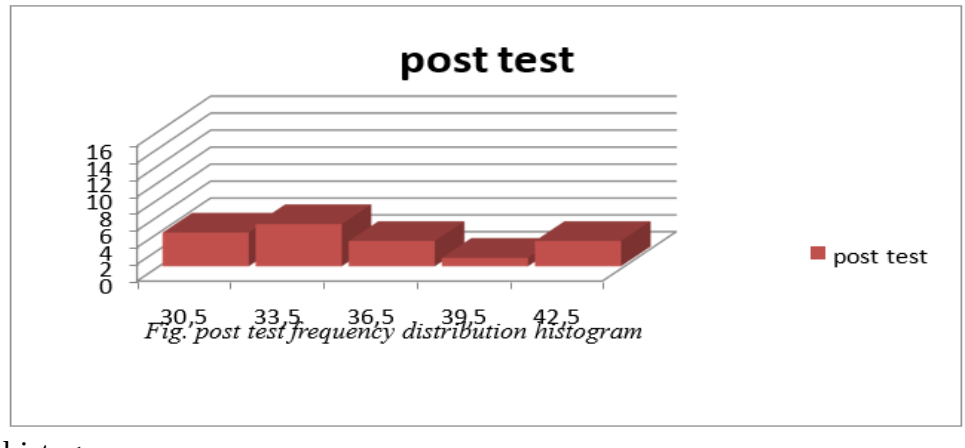

Figure 2. Posttest histogram

Analysis Prerequisite Test

Before conducting the t-test, a prerequisite analysis of data analysis will be carried out which includes normality test and homogeneity test. The results of the prerequisite analysis test are presented below:

Standard Deviation Test

The standard deviation test is used to measure the amount of variation or spread of a number of data values. Here's how to calculate the standard deviation:

Formula:

$$s = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(x_i - \bar{x})^2}$$

Standard deviation of pre test:

$$s = \sqrt{\frac{1}{N-1}\sum_{i-1}^{N}(xi - \bar{x})^2}$$

= 6.72

Standard deviation of post test:

$$s = \sqrt{\frac{1}{N-1}\sum_{i-1}^{N}(xi - \bar{x})^2}$$

= 5.27

Normality Test

The normality test is used to determine whether there is a change in agility in tunagharita students through a variety of small games using the *Lilliefors* test formula. If $L_{score} < L_{table}$ then the results are not normal if $L_{score} > L_{table}$ then the results are normal. The formulation of the hypothesis to be tested is as follows:

Table 3. Normality test results

Description	Pretest	Post test
Average	39.9362	37.372
Standard deviation	6.836382	6.728392
Scoreer	0.158392	0.157923
Ltable (sig level 0.05)	0.213	0.213
Decision:	**Not Normal**	

Based on the normality test table 4.3 the pretest and posttest results show that $L_{score} < L_{table}$ which means the results are not normal.

Homogeneity Test

The homogeneity test is used to see the similarity of the two variants of the pretest and posttest. The results of the homogeneity test are in the following table:

Table 4. Homogeneity test

Description	Average	Variance S ^{2}	Fscore	Ftable	Decision
Pretest	38.7513	21.53783	0.9589250	0.6838956	Homogeneous
Post test	38.821	22.73723			

The homogeneity test is a test of the equality of data variants, this study is to compare the largest variant and the smallest variant. Based on the homogeneity test table above the pretest with the variant value (S) is 21.53783 while the variant value on the posttest (S^2) is 22.73723 from the calculation results there is F_{score} is 0.9589250 and F_{table} is 0.6838956. The table above uses a significant level $\alpha = 0.05$, it can be seen that the results show that $F_{score} = F_{table}$. So it can be concluded that there is no significant difference, meaning that the data is homogeneous or the same.

T-test Analysis

Hypothesis testing or t-test is conducted to determine whether or not there is a significant effect on the learning model of traditional Gobak Sodor games to improve the agility of State Special School (SLB) of Wiradesa students in Pekalongan Regency.

Table 5. T-test t-Test: two-sample assuming unequal variances

	Variable 1	*Variable 2*
Mean	38.7513	37.821
Variance	21.53783	22.73723
Observations	20	20
Hypothesized Mean Difference	0	
df	30	
t Stat	0.5102939	
P(T<=t) one-tail	0.3301	
t Critical one-tail	1.832937	
P(T<=t) two-tail	0.648293	
t Critical two-tail	2.239173	

Based on the calculation of the t-test that has been carried out, it is obtained that Tscore is worth 2.239173 and Ttable is worth 1.832937 so that the result is $T_{score}>T_{table}$ which means that there is an influence on the speed of children with disabilities. So it can be concluded that there is an effect of "Gobak Sodor", a traditional Indonesian game to improve the agility of children with disabilities State Special School (SLB) of Wiradesa, Pekalongan Regency.

DISCUSSION

An inclusive and pro-disability national curriculum is essential to ensure that every child, regardless of physical or cognitive ability, has equal access to quality education. This means creating a welcoming and supportive learning environment for students with disabilities, where their special needs are recognized and met through adapted teaching methods and adequate resources (Setyaningrum et al., 2021). With an inclusive curriculum, students with disabilities can develop their full potential in academic, social and emotional aspects without feeling isolated or marginalized from their peers (Alnahdi, 2020; Gage, 2021).

Partiality in the national curriculum also has significant long-term impacts on social and economic development. Students with disabilities who receive inclusive education have a greater chance of actively participating in society, working and living independently (Kurnia & Apsari, 2021). This not only benefits the individual but also contributes to diversity and overall social well-being (Pramantik & Burhaein, 2019). By integrating the principles of inclusion in the national curriculum, a country demonstrates its commitment to human rights and social justice, which in turn supports the achievement of the sustainable development goals (SDGs), particularly in terms of quality education for all (Billingsley & Bettini, 2019; Leu, 2022).

Integrating traditional games such as gobak sodor into the national physical education curriculum can make a significant contribution to students' physical and mental development (Usmeldi, 2020). Gobak sodor, which involves fast movements, coordination and strategy, serves as an effective means to improve students' motor skills, such as agility and dexterity (Batsiran & Junaidi, 2022). By making this game part of the physical education routine, students will not only get a balanced physical workout, but also the opportunity to develop social skills such as teamwork and communication (Bertills, 2018). The game also trains students to think strategically and make quick decisions in dynamic situations, skills that are useful in many aspects of life.

Incorporating gobak sodor and other traditional games into the curriculum also plays an important role in the preservation of local culture amidst globalization (Usmeldi, 2020). By teaching these games in schools, students not only learn about the importance of physical activity, but also get to know and appreciate their nation's cultural heritage. This can build a sense of cultural pride and identity among students from an early age.

Moreover, through formal education, traditional games can continue to be preserved and introduced to the younger generation, ensuring that this cultural heritage remains alive and relevant in the future.

Research on the effect of traditional Indonesian games on students' agility shows that the physical activities contained in traditional games significantly improve students' motor agility (Purwasih, 2020). Games such as cricket, gobak sodor, and galah asin involve fast and purposeful movements, which require hand and foot coordination and quick responses to changing situations. This study found that students who regularly participated in these games showed higher improvements in agility than those who were not actively involved (Ansharudin, 2022; Faridah et al., 2024).

Traditional Indonesian games such as engklek, benteng, and galasin have been shown to have a positive influence on student agility. The physical activities contained in these games require students to move quickly, change direction suddenly, and balance the body in various positions. Research conducted by (Nugraha et al., 2023) shows that students who regularly play traditional games have a better level of agility compared to students who are not involved in the game. This is due to the intensive training of muscles and body coordination that occurs during the game.

The game of gobak sodor is one of the traditional Indonesian games that has proven effective in improving students' agility skills. In this game, players are required to move quickly and agilely past guards who try to block them on a narrow path. A study conducted by (Kurniawan & Junaidi, 2024; Purwasih, 2020) found that students who regularly played gobak sodor showed significant improvement in agility ability compared to students who did not participate in the game.

This increase in agility occurs because gobak sodor demands a quick and precise response in dealing with changing situations, such as determining when to move forward or backward and how to avoid guards (Wibisana & Royana, 2023). This exercise indirectly trains the muscles of the body, improves coordination between eyes and feet, and increases students' reaction time. This intensive exercise also requires strategy and quick decision-making, which overall improves students' motor agility.

The results of this study suggest that the integration of gobak sodor game into the physical education curriculum in schools can provide significant benefits in the development of basic motor skills, especially agility. In addition, the game also teaches the values of cooperation and strategy that are useful for students in wider situations. Therefore, gobak sodor is not just a physical activity but also a holistic skill development tool for students (Charunnissa, 2022; Learning et al., 2018).

Traditional games such as gobak sodor can provide significant benefits for students with disabilities, especially in terms of motor and social development. Gobak sodor, which requires players to move quickly and think strategically, can be adapted to meet the needs of students with disabilities, helping them improve agility, coordination and balance. According to research published in the International Journal of Disability, Development and Education (Dahl, 2020), structured physical activities such as traditional games have great potential to improve gross and fine motor skills in children with different types of disabilities. With the right adjustments, gobak sodor can be a means to increase the confidence and social participation of students with disabilities, allowing them to feel a sense of accomplishment and success in inclusive physical activity.

In addition to the physical benefits, gobak sodor also plays an important role in supporting the social and emotional development of students with disabilities. The game requires students to interact and cooperate with peers, which can improve communication skills and strengthen social bonds. Research by (Jung, 2022) in the Journal of Adapted Physical Activity showed that participation in group games can help reduce the sense of social isolation and increase the engagement of students with disabilities in the school environment. Gobak sodor, with its inclusive and participatory approach, can create a supportive environment where students with disabilities feel accepted and valued, which in turn contributes to their emotional well-being.

Traditional games such as gobak sodor have great potential in supporting the physical and cognitive development of students with disabilities. Gobak sodor, which involves repetitive movements and simple rules, can help improve basic motor skills such as agility, coordination and balance in students with intellectual disabilities. According to research published in the *British Journal of Learning Disabilities* (Bonati, 2021), structured physical activities, including traditional games, can

improve gross motor skills and reduce the tendency of stereotyped behaviors in children with intellectual disabilities. Through participation in gobak sodor, these students can experience significant improvements in their motor skills, which also contributes to improved daily functional abilities.

In addition to the physical benefits, gobak sodor can also support the social and cognitive development of students with intellectual disabilities. The game encourages positive social interactions and can improve communication skills and cooperation among students. A study published in the Journal *Disability & Rehabilitation* (Magnusson, 2019) found that participation in group games such as gobak sodor can improve social skills and reduce social isolation in students with intellectual disabilities. With its easy-to-understand rules and inclusive nature, gobak sodor also helps students with visual impairments understand basic concepts such as turns, rules, and simple strategies, all of which are important for their cognitive development.

Based on the results of this study, it is recommended that further studies be conducted with a wider scope and more diverse methods. One of the main recommendations is to conduct a longitudinal study to see the long-term impact of regular participation in gobak sodor on the development of agility and motor skills of students with disabilities. In addition, research involving larger and more diverse samples could provide a more comprehensive understanding of how variations in disability levels affect the outcomes of this intervention. The use of technology such as video analysis to monitor and evaluate students' movements during the game could also be a useful tool to provide more accurate and in-depth data.

The results of this study have important implications for physical education practice in schools serving students with intellectual disabilities. The integration of gobak sodor into the physical education curriculum can be an effective strategy to improve students' agility and motor skills. With support from teachers and school administrators, the game can be adapted to meet students' individual needs, allowing them to participate fully and gain maximum benefit. Further research is also needed to develop practical guidelines for teachers to implement these traditional games inclusively and effectively.

Conclusion

Based on the results of the study between the pretest and posttest, there was an increase in the agility test results of students with disabilities at the State Special School (SLB) of Wiradesa. In addition, based on the results of the normality test and homogeneity test, it can be concluded that gobak sodor (traditional Indonesian game) has an effect on the agility of students with disabilities.

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Conflict of Interest

We declare that the article we have written is not involved in any conflict of interest.

Ethics Statement

This research has met ethical rules. Research ethical approval was obtained from the UPGRIS Research Ethics Committee with project number 075/LPPM-UPGRIS/VII/2024.

Author Contributions

Study design, RIF and KM; Data collection, KP and SDA; Statistical analysis, KP and SDA; Data interpretation, RIF, WMIN and KM; Literature search, RIF, WMIN and KM. All authors have read and approved the published version of the manuscript.

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