

## Research Article

# Improving Body Balance of Students with Disabilities Through Foam Jumping Game

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**Abstract.**

This study aims to see the effect of foam jumping games on improving the body balance of children with disabilities. The research method used is an experimental method in the form of single-subject reaserch (SSR). The research subjects were students with moderate impairment at SLB Negeri Wiradesa school. Data collection techniques and instruments used are body balance grid instruments. The results of the research with a modified foam jumping game approach for children with moderate impairment have a positive impact on the results of students' body balance. Previous testing had been carried out by increasing the mean level in each phase as the subject in baseline 1 (A1) has a mean level of 62.8.5%, while in the intervention phase (b) it is 71%, and the last phase is baseline 2 (A2) 86%. The conclusion of this study is that foam jumping game can improve the body balance of children with disabilities in SLB Negeri Wiradesa.

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**Published** 12 March 2024

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Selection and Peer-review under  
the responsibility of the ICESRE  
Conference Committee.

**Keywords:** body balance, foam jumping game, children with disabilities

## 1. Introduction

Sekolah Luar Biasa (SLB) or special school is part of a special educational institution organized for every student who is considered to have difficulties in learning caused by abnormalities both physically, socially, mentally and even emotionally [1,2]. Children with special needs (ABK) are children who are unique with certain characteristics different from students in general, both in behavior, personality and even in the concept of knowledge of a new thing that is learned which is slower than other students in the learning process [3,4]. Specifically, children with special needs have intellectual and motor abilities that are below the average of normal children their age [5,6].

The education of children with disabilities has become an essential component of global discussions, as emphasized in both the Sustainable Development Goals (UN 2015a) and the Incheon Declaration (UNESCO, World Education Forum 2015, Ministry of Education, Republic of Korea 2015). The Incheon Declaration emphasized: "The

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achievement of educational goals cannot be deemed complete unless they are attained by every individual. As a result, we pledge to implement essential adjustments in educational policies and concentrate our endeavors on the most marginalized groups, particularly individuals with disabilities, to guarantee that no one is excluded” [7].

Nonetheless, children with disabilities continue to be the most marginalized group within the education system. Plan’s examination of data encompassing 1.4 million sponsored children across 30 countries underscored the enormity of this issue, revealing that children with disabilities are ten times more prone to be excluded from school compared to their non-disabled counterparts [7]. This is very sad to note compared to the education of other normal children around the world.

Education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character and skills needed by themselves, society, nation and state [8]. Equality in schooling, education and equal opportunities with other children is one of the most important aspects of education. this also applies to children with disabilities. this is closely related to aspects of the future life of each child that can affect their well-being and quality of life [9]. Education problems that arise today include equitable distribution of educational opportunities, relevance, and efficiency of education and improving the quality of education [8]. This is not natural but it is a fact that occurs in the field. serious attention like this should be considered by education practitioners in every country.

Physical education is a discipline that involves physical activity with the aim of improving students’ fitness through various types of sports and games. In addition, physical education is also considered as an approach given in the learning process at various levels of education to maintain a balance between academic subjects and their practical aspects [10,11]. Physical education is considered capable of triggering student enthusiasm in the learning process because physical education learning is carried out by paying attention to aspects of the game approach in the process so that it gives the impact of students being happy [12,13]. Based on the above opinion, it can be said that physical education plays an important role in children’s education, including growth and development, mental and motor skills of children.

Adaptive physical education is an educational method that accommodates individual abilities and limitations through adapted physical activities. This approach aims to provide holistic services with planning that focuses on identifying, understanding and resolving problems in psychomotor aspects, which can arise due to limitations in sensorimotor and learning abilities possessed by each individual [14,15]. Adaptive PE is a

form of learning that is used for learning to students by paying attention to certain things that can later provide understanding more easily accepted by students with learning methods that are easily accepted [16,17]. One form of adaptive physical education that can be accepted by children with special needs is by using games which of course have been modified to be safe and fun for students [18,19].

Foam jumping games are one type of game that can be used in learning for children both in formal schools and in special schools that can be used to improve students' abilities and skills in solving every learning problem they learn. With foam jumping games can implement students to learn to work together by coordinating between the eyes hands, feet and hands [20]. Foam jumping games will be easier for students to do and understand because this game is one of the most widely practiced and favored games by children, so that this approach can provide a faster stimulus in helping to get the final results in the learning process to be achieved [21].

Body balance is the body's ability to maintain position, posture and stability while performing physical activities or standing still. It involves coordination between various systems in the body, including the nervous system, vestibular system (balance in the inner ear), visual system, and musculoskeletal system [22,23]. Children with special needs face special challenges related to body balance. Body balance is an important ability that enables children to participate in daily activities, such as walking, standing, playing, and interacting with the surrounding environment [24,25].

Difficulties often encountered in children with special needs are when children jump from one point to another, children walk straight following a line. This is in accordance with the results of observations at SLB Negeri Wiradesa. when we tested students to jump, walk and run along the line, many students could not follow the instructions. The purpose of this study is to improve the ability of body balance of children with tunagrahita by using foam jumping games.

## 2. Method

This research uses experimental research with a quantitative approach. Experimental research is intended to determine whether or not there are effects resulting from something applied to the research subjects [26]. The research design used in the study used a one group pretest posttest design with ordinal pairing technique. Ordinal pairing is pairing research subjects or a way of grouping samples using a ranking system, then placing samples in each group following the "letter S" pattern. The purpose of using ordinal pairing is to equalize the ability of subjects in each group [27].

The population is all students and students of moderate category tunagrahita children totaling 23 students. The sampling technique uses total sampling with all students used as samples [28]. Data collection in this research techniques using test instruments and data analysis techniques used in this study using T-Test assessment. The table 1 below shows the lattice of the balance test instrument.

TABLE 1: grid of body balance assessment indicators [23].

Variable	Subject matter	Indicator	Instrument Items
Body balance	Stand	Stand up straight with outstretched arms	Stand straight by stretching right and left arms to the side. Stand up straight with legs in a stance.
	Walk	Walking straight	Walk in a straight line without going out of line by stretching arms to the side. Walk straight without going out of line. Step backward
	Jump using one leg	Jump using one leg	Jump forward Jump to the right side Jump to the left side Jump with support on the right foot Jump with support on the left foot Jump by relying on right foot while stretching right and left arms to the side Jump by relying on your left foot while stretching your right and left arms to the side.
	Jump using 2 leg	Jump using 2 leg	Jump to top
	Stand on one leg	Lift one leg with your arms outstretched	Lift your right leg up by stretching your right and left arms to the side Lift the left leg up by stretching the right and left arms to the side

### 3. Result and Discussion

#### 3.1. Presenting the Results

Pretest data taken using a test instrument with a total of 15 questions taken 2 times to see the difference in the value of each student without treatment. After the pretest, students were given treatment 4 times with a test at the end of each meeting to see the progress of balance development from the treatment given. Treatment is given once a week twice with a treatment time of 60 minutes and a test time of 30 minutes. After treatment for 4 times, a post test was conducted to see the results of the difference between pretest and posttest data. The maximum score obtained by students if they

are able to do all the tests is 45 points. table 2 below shows the scoring of each test taken.

TABLE 2: Body balance research instruments [23].

No	Instrument Items	Value			
		0	1	2	3
1	Stand straight by stretching right and left arms to the side				
2	Stand up straight with legs in a stance				
3	Walk in a straight line without going out of line by stretching arms to the side				
4	Walk straight without going out of line				
5	Step backward				
6	Jump forward				
7	Jump to the right side				
8	Jump to the left side				
9	Jump with support on the right foot				
10	Jump with support on the left foot				
11	Jump by relying on right foot while stretching right and left arms to the side				
12	Jump by relying on left foot while stretching right and left arms to the side.				
13	Jump to top				
14	Lift right leg up by stretching right and left arms to the side				
15	Lift the left leg up by stretching the right and left arms to the side				

Table 3 below shows the results of the pretest after 2 trials to see the average score of the test taken.

TABLE 3: average pretest result data in the balance test.

Session	Number of questions	Maximum score	Test scores	Percentage (%)
1	15	45	36	62,8%
2	15	45	28	54,3%

(Source: Research Data. 2022)

Based on the data in Table 3, the calculation results that show the results of the study can be seen through the results obtained that the data that got the maximum

score in sessions 1 and 2 got different values obtained with the score in session 1 with a test score of 36 with a percentage of 62.8% with the lowest test score in the second session with a score of 28 with a percentage of 54.3%. This gives the result that there are different results obtained even though it is not monitored far.

At this stage, the treatment is given 4 times a meeting. Each meeting students do a modified foam jumping game. At each meeting, a balance test is carried out to see progress every week. Table 4 shows the average acquisition of students in taking the balance test.

TABLE 4: Intervention Percentage Calculation.

Session	Number of questions	Maximum score	Test scores	Percentage (%)
1	5	5	3	48%
2	5	5	2	54%
3	5	5	4	71%
4	5	5	5	97%

(Source: Research Data. 2022)

Table 4 shows the results of 4 treatments, it can be obtained that the data obtained has a test score in the lowest value category found in test score 2 with a percentage of 54%. the maximum test score category is in the 4th test with a percentage of 97%. Data in the last treatment showed a significant increase in each treatment. Figure 1 below shows a line diagram of the improvement of students' balance test results in each treatment given each week.

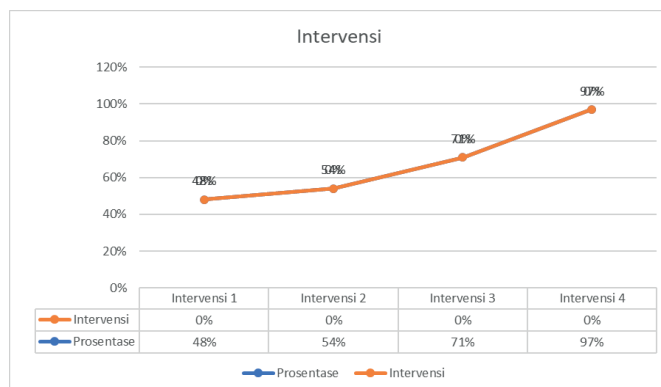


Figure 1: average balance test results in each treatment.

The post-test was conducted after giving 4 treatments. The post-test was conducted 2 times to see the difference from the results of the treatment that had been given. Table 5 shows the average results of the balance test.

TABLE 5: average posttest result data in the balance test.

Session	Number questions	of Maximum score	Test scores	Percentage (%)
1	15	45	39	81%
2	15	45	41	86%

(Source: Research Data. 2022)

Based on the data in Table 5, the results of the posttest calculation show that the data that get the maximum score in sessions 1 and 2 get different values, namely the value obtained in session 1 with a test score of 39 with a percentage of 81%. The second session test value with a value of 41 with a percentage of 86%. This gives the result that there is a difference in test results that is not too far apart. Table 4 below shows the comparison of the average results of the pretest with the posttest.

TABLE 6: Comparison of average pretest and posttest results.

Tes	Session	Number of questions	Maximum score	Test scores	Percentage (%)
<b>Pretest</b>	1	15	45	36	62,8%
	2	15	45	28	54,3%
<b>Posttest</b>	1	15	45	39	81%
	2	15	45	41	86%

(Source: Research Data. 2022)

Based on table 4 above, it shows the results of the comparison of the average pretest and posttest that there is a difference in the lowest score of the pretest which is 28 or 54.3% while the highest score in the posttest is 41 or 86%. With this increase, it can be concluded that the modified foam jumping game can improve the balance of students with disabilities. Figure 2 shows the increase in data from pretest to posttest results.

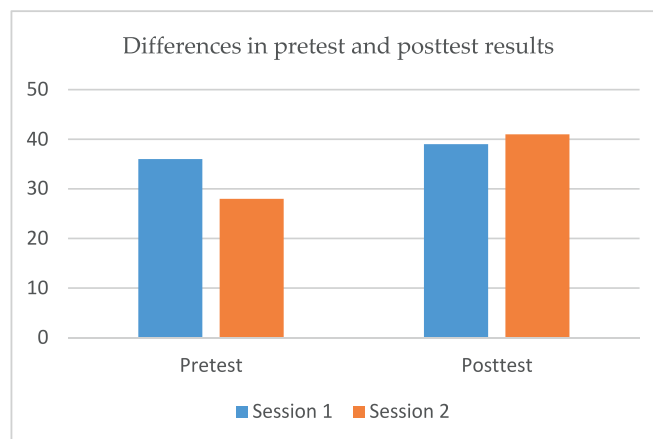


Figure 2: Differences in pretest and posttest results.

### 3.2. Create a Discussion

Based on the data above, there is a difference in the level of student balance before and after treatment. Modified foam jumping game, making students feel safe and comfortable to move without fear. The selection of materials with foam, and the selection of attractive colors is one of the modifications that is suitable for special school (SLB). The arrangement of letters in the puzzle is randomized and then students jump from one letter to another to make cognitive improvements and balance. Based on 15 test instruments, the most influential improvement in balance is when jumping from the front, standing on one leg, and walking straight.

The results of this study are in accordance with Khoerunnisa research [29] that playing puzzles can help children develop their fine motor skills such as being able to draw a whole person, imitate geometric figures (triangles, circles and squares), write their first name, cut and glue. In other study from Agus Nama Adi [30] that effect of traditional games (engklek) on children aged 6-12 years is proven to improve the level of dynamic balance of elementary school children.

Foam jumping game is a game with jumping from one letter point to another letter point using several improvements including; walking, jumping with two leg, jumping with one leg, standing on one leg, jumping with one leg support. With the increase in training and difficulty of the game, students are challenged to continue playing and the level of body balance also increases. indirectly, in addition to the level of body balance that increases, the cognitive level of children also increases, this can be seen from the increase in students' knowledge of the next jump is the next letter from the letter they step on.

## 4. Conclusion

The conclusion of this study is that foam jumping games can improve the body balance of children with disabilities at SLB Negeri Wiradesa. This can be shown by a significant increase in body balance test results between pretest and posttest. In addition, from each test at the end of the treatment, the test results showed a continuous improvement.

## Acknowledgements

Thanks are given to the teachers at SLB Negeri Wiradesa for their permission to conduct the research. In addition, thanks also to SLB students who turned out to be extraordinary



enthusiasm when they saw a new game. Thank you to the layout reader and proofreader team for reviewing our article.

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