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Application of modification of the bocce ball game to gross motor manipulative movements in children intellectual disability SLB-C YPPLB Cendrawasih Makassar

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Abstract

The purpose of this study was to determine the Effect of Application of Modified Bocce Ball Game on Gross Motor Manipulative Movements in intellectual disability Children SLB-C YPPLB Cendrawasih Makassar.

Methods: This research is an experimental design research using a pretest and posttest one group design. The research sample was 25 in intellectual disability Children/students who were selected by purposive sampling technique. In the initial implementation of the test, the initial pretest data collection was carried out by measuring the coordination of the manipulative movements in intellectual disability children using a throw fun target test. Implementation: the sample stands behind the throwing boundary line then the participant (sample) throws the ball in a directed direction as much as 5 (five) times towards the target.

Evaluation: The score is obtained based on the distance of the stop location approaching or hitting the target. After the pretest was completed, it was continued by giving treatment to the sample using game modifications for 6 meetings. Then do the final test or posttest using the same test items. The data analysis technique used is Descriptive Analysis, Normality Test and T Test. This study uses the Throw fun target Test instrument by using a modified Bocce game with the model of throwing the ball at the target with coordinated motion.

Results: Based on data analysis, descriptive test results before the exercise program, acquired an average value (mean) 8.63, a minimal 6, maximum 12, standard deviation 1.49. After the exercise program, acquired an average value (mean) 12.5, a minimum 8, maximum 18, standard deviation 12.22. The results of the normality check of the facts through reading the Shapiro-Wilk value (number of respondents < 50) obtained a value of 0.427 (pre-test) and 0.217 (post-test) by looking at the value of sig. > 0.05 then it is stated that all the data tested show normal values. From the results of the analysis of the pretest and posttest value, the average influence and difference was 3.421.

Conclusion: Thus, it can be concluded that the application model of the Bocce game modification has a significant influence on the gross motor manipulative motion in intellectual disability children/students.

Keywords: Intellectual disability, bocce, manipulative movement, gross motor

Introduction

Sports activities are not only intended for normal children, but children with special needs also need sports activities. (Arimbi, 2022) [7]. There are still many people in Indonesia who think that disability is viewed negatively. Children with special needs are considered unable to carry out any activities including sports. Therefore it is necessary to apply game modifications.

Intellectual disability children with special needs are children who are significantly impaired (physical, mental-intellectual, social, and emotional). (Triadyna, 2018) Children with special needs are children who have different characteristics from children in general. In Indonesia, children with special needs who have developmental disorders and have been given educational services, namely: visually impaired, deaf, mentally retarded, physically disabled, mentally retarded, autistic, double disabled, ADDH (hyperactivity), and learning difficulties (learning disabilities), (Priambodo, 2020) [37].

Intellectual disability children are children who experience mental developmental disorders due to low levels of intelligence (David, 2002) ^[13]. The disorder occurs in the process of development when compared to other children of his age so that children with special needs require special education services. Children with special needs always look for and expect the same opportunities and a balanced life with those who are categorized as normal children. (Cindy, 2017) ^[11].

One of the important education for intellectual disability children is adaptive sports. Adaptive sports are motion learning methods for children with special needs designed to identify and solve problems in the motor domain. The motor domain in children with special needs includes the basic motor skills of gross, fine, locomotor, non-locomotor, and manipulative. This motor problem arises as a result of limited sensory abilities, decreased organ function, and limitations in learning abilities, so that the motor skills of children with special needs become sluggish. For example in intellectual disability children. (Arifin, 2017) ^[5]. Currently the concept of education for all, including for intellectual disabilities. Children with mental retardation, physiological and psychological characteristics are characterized by limited intelligence (Phytansa, 2018) ^[36].

Intellectual Disability is another word for mental retardation or mental retardation which causes a significant decrease in overall intellectual function and directly causes impaired social adaptation, and manifests during the developmental period. Educating students with disabilities with those who are not in integrated physical education has become commonplace. While the literature has identified that the subjective experiences of students with disabilities in such integrated settings often include bullying, isolation, and discrimination, little is known about their experiences in independent physical education (Pellerin *et al.*, 2020) ^[34].

Children with mental retardation are children who have intellectual intelligence below the average, one of which is damage to brain function. Damage to the brain is what will usually make a mentally retarded person experience delays in the development of movement, including the function of their movement coordination. (Fatmawati, 2012) ^[16]. The prevalence of the classification of mental retardation varies. In some books there are those who write that 75% of the mentally retarded population are mild mentally retarded. There are also those who state that 70% of the mentally retarded population are mild mentally retarded, 25% are moderately mentally retarded and 5% are severe and very severe mental retardation. (Agustin, 2017) ^[4]. In this regard, (Wahedatul & Sopandi, 2019) ^[50]. These limitations are expressed in one's conceptual, social and practical daily life skills. Some people with intellectual disabilities are mildly affected, making the disability difficult to recognize without visual cues. Intellectual disability is diagnosed through the use of standardized tests of adaptive intelligence and behavior. Individuals with intellectual disabilities who are provided with appropriate personal support over a sustained period generally have better outcomes in life (Antal *et al.*, 2022) ^[2]. Individuals with intellectual disabilities have a limited ability to benefit from academic training. They have inadequate abilities in memory, abstract thinking, problem solving, attention and the ability to generalize. (Sood *et al.*, 2016) ^[41].

One of the motor development is gross motor. Gross motor skills are the ability to perform movements that involve large muscles, such as throwing, walking, running, jumping, and jumping. (Nurbani, 2019) ^[31] Expressed an opinion regarding gross motor skills, namely "gross motor skills control body movements which include skills to control large muscles".

(Pan *et al.*, 2018) Gross motor skills in children with moderate mental retardation have developed better than fine motor development, because in fact gross motor skills develop faster than fine motor skills. (Trigo & Willig, 2022) ^[47] Motor skills used to make it easier for people with intellectual disabilities to learn the game. At the same time, stating that time and lots of repetition are needed to acquire precision for this skill (Özkan & Kale, 2021) ^[32]. When an athlete begins to learn motor skills specific to a sport, they must also begin the development of gross motor skills, which will allow further development of specific motor functions (Mujea *et al.*, 2019) ^[30].

It was found the fact that the low ability to throw the ball in the Bocce game in mentally retarded children so that in addition to the above obstacle factors, less varied and monotonous training also had an impact on decreased achievement. (Esser, 2015) ^[14] Sport is an inseparable part of everyday life. Day. Sport has indeed played a very strategic role in human life (Jacinto *et al.*, 2021) ^[21]. The bocce sport is a sport for everyone, age, gender and ability. Everyone who can roll the ball can play bocce ball (Hamzanwad, 2020) ^[19]. The bocce game is a game by rolling the ball. The benefits obtained are that it can hone children's concentration by focusing on throwing the bocce ball close to the target ball, it can attract children's attention because the color of the bocce ball is attractive, easy to use, can be done by anyone and anywhere, and can train muscle flexibility. Back muscles, arms and legs in children (Yusuf Agung, 2021) ^[51].

The purpose of the game is to throw a bocce ball, to train children's finger and hand muscles, to train hand and eye coordination, to train fine sensory in children's hands when throwing and eye directions, to train gross sensory in holding the ball. (Michael, 2012) ^[28] to throw, train children to recognize various colors (red, green and yellow) train children to count (one, two, three and four), train cooperation in play groups, practice patient habits in doing/acting (Rosmiati, 2017) ^[39].

Special Schools (SLB) that have been developed in Indonesia, such as in SLB Paedagogia Maospati, there are children with moderate mental retardation who are faced with problems, including the limited absorption capacity of mentally retarded children in receiving subject matter, which is influenced by physical limitations and is also influenced by the level of their intellectual abilities at school. Below average and not focused on taking orders (Lubysheva & L, 2021) ^[27]. Circumstances like this cause them to experience obstacles in participating in lessons so, it is necessary to have a learning strategy that will have an impact on the learning outcomes of children with moderate mental retardation. Considering the ability of mentally retarded children in the field of physical education, sports and health as a measure of success in learning, (Badruzaman, 2021) ^[9] then it is very important to overcome the barriers to skills and intellectual intelligence limitations. Responding to this, the role of physical education teachers is very important in improving especially the skills of moderately mentally retarded students on the ability to throw (Puspitaningsari, 2020) ^[38].

From the results of observations, it is known that there is a lack of maximum and comprehensive implementation of the function of adaptive physical education. This is evidenced by the lack of application of game modifications, so that many students are lazy to move or are bored with the material during the lesson. Therefore we need an innovative and fun teaching method in the form of game modifications adopted from the Bocce ball game so that they can continue to move because of their limitations so that they are able to stimulate nerves and develop motoric movements of the hands and feet (De Souza *et al.*, 2015).

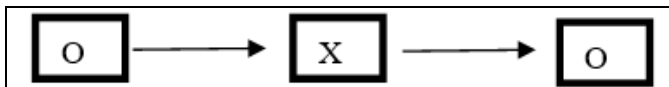
Based on the above background, the researcher is interested in

conducting a study on "The Application of Modified Bocce Game to Coordination of Gross Motor Manipulative Movements in intellectual disability children SLB-C YPPLB Cendrawasih Makassar"

2. Materials and methods (Times New Roman, 12, Bold)

In this research, the type of research used is quantitative research with an experimental model, which is a study that seeks to find the effect of giving Bocce Ball Game on the coordination of manipulative movements in mentally retarded children.

The research design used in this study is "One-group Pretest-Posttest Design" which is an experiment that uses pre-test and post-test to compare the situation before being given treatment and after being given treatment (Sugiyono, 2019)^[42]. This study uses a design through a test before being given treatment (O1) and after being given treatment (O2), so that there is a comparison between O1 and O2 to determine the effectiveness of the treatment (X).



(Sugiyono, 2019)^[42]

Fig 1: Research design

Information

O1 = Pre-test

X = Treatment

O2 = Post test

The population in this study were all intellectual disability students at SLB-C YPPLB Cendrawasih Makassar. The sampling technique in this research is purposive sampling (Halim, 2018). Based on the specified criteria, namely being able to move and have the ability to move. So after the implementation of the research, a sample of 25 samples was obtained based on the specified criteria. The instrument of the manipulative movement coordination test is done by throwing the ball. The data collection techniques are as follows:

1. Observation: Observation is a technique of collecting data through the process of observation and memory. In this study, direct observations were made at SLB-C Cendrawasih Makassar and then the data obtained were used as material to make conclusions.

2. Model Trial: This training model is a model that is often used in Bocce training in schools, before ABK students use a real Bocce ball, so it can be said that the model applied is a standard model derived from a modification of the Bocce game itself. But it is also still carried out by researchers during pre-study before taking the initial data.

1. Implementation stage

- To record students who will be used as samples, namely in intellectual disability students SLB-C Cendrawasih Makassar.
- Prepare and check test facilities and infrastructure, namely: field (flat space), throwing balls, duct tape, pieces of blocks and pre-test and post-test assessment sheets.
- The researcher gave first direction to the sample on how to carry out the research.
- In the initial implementation of the test, the initial pretest data collection was carried out by measuring the coordination of the manipulative movements in

intellectual disability children using a throw fun target test.

- **Implementation:** the sample stands behind the throwing boundary line then the participant (sample) throws the ball in a directed direction for 5 (five) times towards the target/target.
- **Scoring:** scores are obtained based on the distance the stop location approaches or hits the target.
- After the pretest was completed, it was continued by giving treatment to the sample using game modifications for 6 meetings. Then do the final test or posttest using the same test items.
- **The final stage:** The data that has been obtained is then analyzed to answer the research problem, conclude the research, or formulate research results.

In analyzing the data of the research, several statistical tests were used, namely: 1) Characteristics of Respondents 2) Descriptive Test. 3) Data Normality Test. 4) Hypothesis Test.

3. Results & Discussion

This section presents a presentation of the results of data analysis and a description of the findings. The effect of changes in the bocce game on the adjustment of the operating behavior of mentally retarded children at SLB-C Ypplb Makassar. Responding to the research objectives and hypotheses, the survey data were processed using SPSS 22 and described descriptive analysis data, data normality test, and hypothesis test.

3.1 Characteristics of Respondents

The characteristics of the respondents used in this study were classified by gender and age. The following description of the data can be seen in the table below:

Table 1: Characteristics of Respondents Based on Gender and Age

Characteristics	N	Description
Gender	25	Male: 15 (60 %) Female: 10 (40 %)
Age	25	16.7 (3.73)

Table 1 above shows that there are 15 (60%) male respondents compared to 10 (40%) female respondents, while the average age is 16.7 years with an SD of 3.73.

3.2 Descriptive Data Analysis

Descriptive data analysis aims to obtain an overview of the distribution of research data. An explanation of the data can be seen in table 2.

Table 2: Distribution of pretest and posttest data

Statistics			
		Pre Test	Post Test
N	Valid	25	25
	Missing	0	0
	Mean	8.63	12.05
	Std. Deviation	1.499	2.223
	Variance	2.246	4.942
	Range	6	10
	Minimum	6	8
	Maximum	12	18
	Sum	164	2299

The explanation from table 2 above can be seen as follows:

- Pre-test data is obtained from a range of 6, a minimum of

6, a maximum of 12, a total value of 164 (sum), an average value (mean) of 8.63, a standard deviation of 1.499, a variance of 2.246.

- Post Test data obtained a value of range 10, minimum 8, maximum, total value 229 (sum), average value (mean) 12.05, standard deviation 2.223, variance 4.942.

3.3 Data Normality Test

Normality test is a test carried out to evaluate the distribution of data in a set of data or variables, regardless of whether the data is normally distributed. Normality test helps determine whether the data collected is normally distributed or taken from a normal population

Table 3: Data Normality Test

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	DF	Sig.	Statistic	DF	Sig.
Pre Test	.190	25	.071	.952	25	.427
Post Test	.177	25	.119	.935	25	.217
Difference	.220	25	.017	.922	25	.122

Based on table 3 above, it can be obtained the value of the Normality Test by reading the Shapiro Wilk test (the number of respondents < 50) the value of the normality test of the data is as follows:

- Pre test measurement data, obtained the value of Sig = 0.427 (sig > 0.05)
- Post test measurement data, obtained the value of Sig = 0.217 (sig > 0.05)
- The difference is obtained by the value of Sig = 0.122 (sig > 0.05)

From the results of table 3 above, it can be concluded that all data follow a normal distribution or are normally distributed.

3.4 Hypothesis Test (Paired T Test)

The hypotheses carried out in this study need to be tested and proven through empirical data obtained in the field through tests and measurements of the variables studied. Furthermore, the data will be processed statistically. The test of this research hypothesis used is the T-test. The test used is a paired T test because the data being tested is Numerical Data with repeated measurements.

Table 4: Hypothesis Test (Paired T Test)

Description	N	Mean	P
Pre-Test	25	8.63	0.000
Post Test	25	12.05	
Difference		3.421	

Table 4 above shows that the average in the group given the Bocce Game Modification is higher than before being given the bocce game. This shows that there is an average increase. The results of the statistical test (paired T test) showed p value: 0.000 ($p < 0.05$) meaning H_0 Rejected, meaning that statistically there was a significant effect of Bocce Game Modification on Manipulative Movement Coordination of Children intellectual disability SLB-C YPPLB Makassar.

3.5 Discussions

Intellectual disability children are children who have mental retardation or have intelligence below average (Sulton & Jajat, 2019) ^[43]. One of the characteristics of mentally retarded children is that they have poor movement coordination (Protic & Válková, 2018) ^[35]. Coordination is a

very important movement for mentally retarded children, especially in daily life. So it is necessary to find a way to improve their coordination by using the play method. The playing method in sports learning will help foster motivation and enthusiasm for adaptive sports material, because children with special needs for mental retardation prefer things that are fun and exciting (Widodo, 2015) ^[49].

Gross motor skills (GMS) are defined as skills that cover all body parts in the form of movement or stretching (Febrianingrum & Article, 2021). Some skills that are classified as fundamental are locomotor which includes running, racing, jumping, sliding, jumping, and mastering objects such as throwing, catching, hitting, and kicking. Development of gross motor skills; however, it plays an important role in children so that they can progress to master the more complex skills needed in life (Satria *et al.*, 2021). Meanwhile, according to Haapala, gross motor development is not only important for the next level of motor skills, but also for cognitive development such as control efficiency and memory.

Sports games are one of the learning approaches that can be applied in intellectual disability children through the play method (Inayah, 2019). Because learning through a play approach will make students happy and not easily bored with what is ordered. The throwing movement is one of the basic manipulative movements that have direction and purpose, the movement is by swinging the hand in a certain direction. The movement made when throwing is using strength and hand position when kicking requires coordination of several elements of movement, there needs to be balanced eye and hand coordination to perform this movement.

Bocce ball game can be categorized as a static sport (Atış *et al.*, 2021). These sports involve the athlete focusing on the target in a static position and requiring them to use good gross motor coordination in the process of deciding and making shots (Meimulyani, 2021) ^[29].

Some theories through the results of previous research that the coordination of manipulative movements in mentally retarded can be trained with various modified exercise models because mentally retarded children have limitations in moving so that modifications need to be made in the form of sports and games that can stimulate children's movement abilities through fun and interesting movements to do students with special needs.

It has been proven in this study that the bocce ball game which is carried out either independently or systematically has the benefit of increasing gross manipulative motoric motion in mentally retarded children and has an effect on the whole body. It has long been proven and supported by empirical or scientific studies (Lan *et al.*, 2018). Furthermore, this affirmation is also proven in the case of people with intellectual disabilities, the modification of the bocce ball game can have a significant effect. For this population category, it can be illustrated in the following diagram.

The Research aims to determine the effect of Bocce's game modification on gross manipulative motoric motion in intellectual disability children. The study was conducted at SLB-C Makassar, involving a total of 25 samples who were SLB-C YPPLB Makassar students aged 6-22 years, formed in one group where the group was given treatment/training for 6 meetings, although it should have been done for 12 meetings in this case it was only given for 6 meetings following the learning schedule and school holidays, this research was conducted 2 times in 1 week, other data collected as the characteristics of the sample in this study are age and gender.

Based on the results of the research on the initial measurement, the average result of manipulative motion coordination was 8.63, then the final test measurement obtained an average result of 12.5, so there was a difference of 3.421. Thus, it can be concluded that this modified Bocce game model has a significant influence on the gross motor manipulative motion in intellectual disability students of SLB-C YPPLB Cendrawasih Makassar.

As has been described in several theories through the results of previous studies that the coordination of manipulative movements in mentally retarded can be trained with various modified exercise models because in intellectual disability children have limitations in moving so that modifications need to be made in the form of sports and games that can stimulate children's movement abilities through movements that fun and interesting for students with special needs. (Tsimaras *et al.*, 2014) ^[46].

It is possible to improve the health of children with intellectual disabilities, as well as their level of physical development and fitness, as well as their level of motor coordination, with the aid of specially chosen adaptive physical education tools and techniques, with a focus in

particular on the modification of the bocce ball game. Children with intellectual disabilities benefit from doing gross motor activities to develop their intelligence and mental ability, which enhances the effectiveness of all correctional work overall. (Krutsevich *et al.*, 2020) ^[23].

This study has a positive value in addition to increasing gross motor skills, namely the development of traits in mentally retarded children is getting better, there is a significant increase in gross motor skills in intellectual disability children through this bocce ball game, because the bocce game is a game devoted to children with intellectual disability, where the game This program is specifically designed for children with disabilities, especially children with moderate mental retardation. This is in line with what was stated by (Khamdani, 2018) ^[24] "Children with intellectual disabilities in the sense of lack or mental retardation, namely children who are identified as having such a low level of intelligence (below normal) that to carry out their developmental tasks they require special assistance or services, including in the needs of their education and guidance programs".

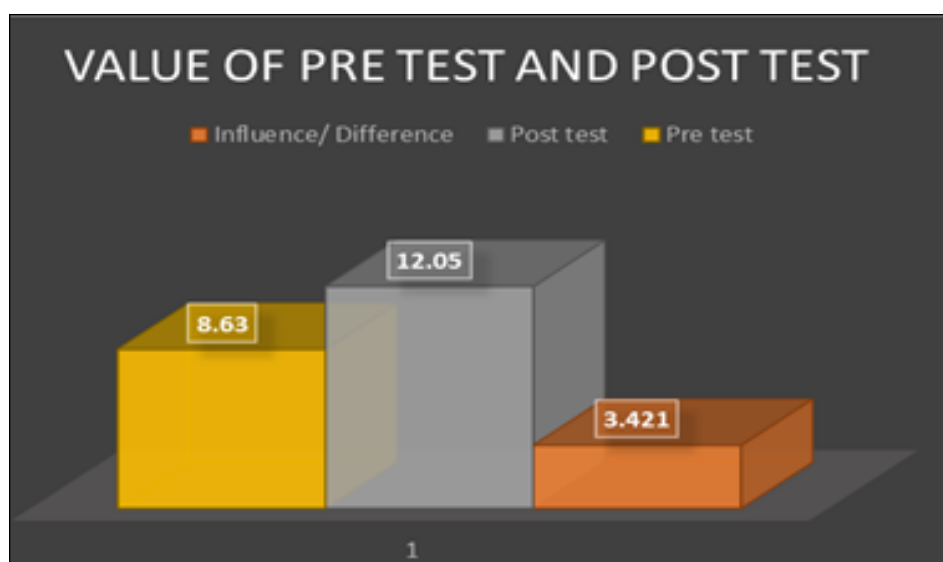


Fig 1: Diagram Average Value of Pretest and Posttest

4. Conclusions

Based on the data analysis and discussion of this study, it can be concluded that the application of the modified Bocce game to the gross motor manipulative motion of intellectual disability children SLB-C Ypplb Makassar has a significant effect. Thus, the modification of the Bocce game has a significant effect on the coordination of gross motor manipulative movements in intellectual disability children.

It has been proven in this study that bocce ball games that are carried out either independently or systematically have benefits for increasing gross manipulative motor movements in intellectual disability children and providing effects on the whole body. It has long been proven and supported by empirical or scientific studies. Furthermore, this affirmation is also proven in the case of people with intellectual disabilities, modification of the bocce ball game can have a significant effect.

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