

**Traditional Games on Increasing Arm and Leg Muscle Strength in Deaf Students**Arimbi¹✉, Ichsani², Poppy Elisano Arfanda³, Nurliani⁴, Rusli⁵, Sarifin⁶Faculty of Sports Science and Health, University Negeri Makassar, Makassar, Indonesia¹²³⁴⁵⁶**Article History**

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Keywords:Traditional games;
Muscle Strength; Deaf**Abstract**

The purpose of this study was to find out how effect of the traditional tug of war game on increasing the arm and leg muscle strength of students with special needs for the deaf. The tug of war game is one of the traditional games that is very popular among the people. This traditional game was chosen because in several references it is known that this game can affect the strength of the hand and leg muscles, as it is known that children with special needs or disabilities have difficulty active movement as a result of the inability of some of their body muscles, one of the most common conditions is weakness in the muscles of the legs. Children with hearing impairment also have the right to receive proper teaching so that their development and growth can run well, especially their movement or psychomotor development. This research will involve all deaf students at SLB-B YPPLB Cendrawasih Makassar, which lasts for 4 weeks with two measurements at the beginning and end of the study. The research method used is one group pre post test. Measurement of arm muscle strength using a hand dynamometer and leg muscle strength measurement using a leg dynamometer with an accuracy of up to 0.5 cm. The results showed that there was a change in arm muscle strength where the average increased after tug of war training with an average of 25.28 kg (7.34) increased to 29.94 kg (8.28) with a change of 4.66 kg and changes in leg muscle strength after routine tug of war, where the average experienced the increase after tug of war with an average of 28.23 kg (8.57) increased to 34.35 kg (8.17) with a change of 6.12 kg. The conclusion of this study is that the traditional tug of war game which is applied for 4 weeks has an effect on increasing the strength of the arm and leg muscles of deaf students.

How to Cite

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INTRODUCTION

Adaptive education for children with special needs is a comprehensive service delivery system designed to identify, find and solve problems in the psychomotor domain (Arimbi, 2019). Almost all types of disabled children with special needs (ABK) have problems in the psychomotor realm. Psychomotor problems as a result of limited sensory abilities, including limitations in learning abilities. This condition at the school age level can still be corrected, one of which is through exercise therapy. Various forms of exercise therapy can be given in this condition, but in order not to cause boredom in children, exercise therapy can also be developed from certain forms of games or sports. In this study, researchers will apply one form of traditional games to be a method of therapy for arm and leg muscle strength for children with special needs, taking into account the limitations and comfort required.

Deafness is a general term that indicates hearing difficulties from mild to severe, classified into deaf and hard of hearing (Winarsih, 2010). Deaf people are those who have lost the ability to hear so that they hinder the process of language information through hearing, whether they use or not use hearing aids where the hearing limit they have is sufficient to allow the success of the process of language information through hearing. (Suharmini, 2005) suggests that deafness can be interpreted as a condition of an individual who has damage to the sense of hearing so that he cannot catch various sound stimuli, or other stimuli through hearing.

Some of the definitions and definitions of deafness above are complex definitions, so it can be concluded that a deaf child is a child who has a hearing impairment, either in its entirety or still has residual hearing. Even though deaf children have been given hearing aids, deaf children still need special education services (Rahmah, 2018).

The tug of war game is one of the traditional games that is very popular among the people. The tug of war game is a game with a rectangular area with a length of 20 meters to 40 meters and a width of 5 meters to 8 meters. This game is very simple, just pull the rope until the middle tie of the rope reaches the dividing line. Participants are declared the winner, if one team can beat the other team with a score of 2 – 0 or 2 – 1 (if there is a draw). This game can affect the strength of the hand and arm muscles. According to (Arfanda et al., 2022) arm muscle strength is the ability of the arm muscles to generate tension in a prisoner

and lift the load and According to (Arimbi, 2019) muscle strength is the ability of the muscles to fight the load in one effort. According to (Kra-vitz et al., 2003) muscle strength is the ability of muscles to use maximum power to lift weights. Strong muscles can protect joints. surrounded by the possibility of injury due to physical activity. From the above opinion, it can be concluded that strength is the ability of a person's muscles or group of muscles to exert maximum power to perform contractions or movement of leg muscle strength.

According to (Bafirman, 2008) in sports activities power is a very important biomotor component because power will determine how hard people can hit, how hard people can kick, how fast people can run, and how far people can do repulsion and so on. etc. shoulder muscle strength and teamwork. In addition to the grip and pull of the hand, the strength of the leg muscles directly plays a role in the success of this match.

Good leg strength is very important in supporting a person to be active, but in some conditions a person can lose some or all of his leg muscle strength, such as in the case of children with special needs, as it is known that children with special needs or disabilities have difficulty active movement as a result of not being able to move. the ability of several muscles of his body, one of the most common conditions is weakness in the muscles of his limbs. Children with hearing impairment are also entitled to receive proper teaching so that their development and growth can run well, especially their movement or psychomotor development. One of the psychomotor aspects that must be well developed in primary grade deaf children is the gross motor aspect.

Gross motor is a movement that involves large muscles in the body, such as walking, running, jumping, jumping and so on (Phytanza et al., 2021). Gross motor skills in deaf children will develop more optimally if it is supported by the correct movement process. One way to stimulate the gross motor skills of deaf children is done by playing (Muhtar & Lengkana, 2019) (Amurwani, 2020) tug of war games for children with special needs, for example, the deaf because children with special needs (ABK) with hearing impairment are someone who has a lack or loss of hearing ability either partially or completely due to a partial malfunction. or the entire hearing device, so that he cannot use his hearing device in everyday life which has an impact on his life in a complex manner.

Students with limited hearing need activities that improve posture, rhythm, orientation,

and balance. A discovery method that can be used to develop basic skills is motor education. Which can help reduce anxiety about movement. Balance activity is one of the basic needs for students with limited hearing. Activities to maintain and improve physical fitness and motor skills in deaf children include tug of war games (Destani et al., 2014) (Kurtz, 2007).

METHODS

This study is a quantitative study using the pre-experimental design one group pretest-posttest method (initial test, single group end test). One group pretest-posttest design is a research activity that provides a pretest (pretest) before being given treatment (Arikunto, 2019), after being given treatment then giving a final test (posttest), by collecting data on arm muscle strength with a handgrip dynamometer and leg muscle strength using a leg dynamometer at the beginning before the intervention and at the end after the intervention for 4 weeks.

RESULTS AND DISCUSSION

Table 1. Effects of Tug of War Game on Limb muscle strenght Rerata (S.B)

Arm muscle strenght	Means (S.B)	Δ	P
Pre	25,28 (7,34)		
Post	29,94 (8,28)	4.66	0.000

Table 2. Effect of Tug of War Game on Lib Muscle Strenght

Arm muscle strenght	Means (S.B)	Δ	P
Pre	28,23 (8,57)		
Post	34,35 (8,17)	6.12	0.000

The **Table 1** and **Figure 1**, above shows that there is a change in arm muscle strength where the average has increased after the tug of war game with an average of 25.28 kg (7.34) increasing to 29.94 kg (8.28) with a change of 4.66 kg. The results of the analysis using Paired T-test with a level of confidence ($\alpha = 0.05$). Based on this test, the results obtained with a value of P = 0.000 ($p < 0.05$), this indicates that there is a significant difference between before and after training for the deaf ABK, so Ho is rejected. It means that H1 is accepted so it can be concluded that there is a significant effect of tug of war on the arm muscle strength of deaf children with special needs or in other words, tug of war increases arm muscle strength of deaf students with special needs.

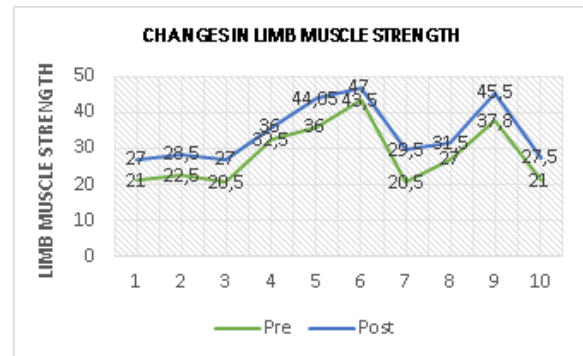


Figure 2. Graph of Changes in limb muscle strenght

The **Table 2** and **Figure 2**, shows that there is a change in leg muscle strength after routine tug of war, where the average has increased after tug of war with an average of 28.23 kg (8.57) increased to 34.35 kg (8.17) with a change of 6.12 kg. The results of the analysis using Paired T-test with a level of confidence ($\alpha = 0.05$). Based on this test, the results obtained with a value of P = 0.000 ($p < 0.05$), this indicates that there is a significant difference between before and after the tug of war game training on the leg muscle strength of the deaf children with special needs, so Ho is rejected. It means that H1 is accepted, so it can be concluded that there is a significant effect of tug of war on the leg muscle strength of deaf children with special needs or in other words, tug of war increases the leg muscle strength of deaf students with special needs.

This study aims to determine how the effect of tug of war game training on the arm and leg muscle strength of students with hearing impairment students. The research was conducted at SLB-B (Category-B Special School) YPPLB Cendrawasih. SLB category-B is an extraordi-

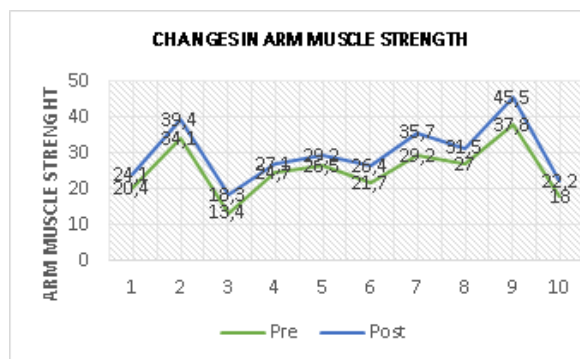


Figure 1. Graph of Changes in arms muscle strenght.

nary school that specifically accommodates the education of children with special needs (ABK) with limited hearing or who are familiarly called deaf. There are two dependent variables and one independent variable measured in this study. The dependent variable consisted of arm muscle strength and leg muscle strength, while the independent variable was tug of war training. Researchers chose the form of tug of war for deaf students because tug of war is a game that can train strength and balance and is easy and relatively safe to play for students with special needs for hearing impairment.

The benefits of tug of war are actually not only to train muscle strength, especially hand muscles and leg muscles, but also dynamic balance in the game because tug of war does require the role of the hands (to pull the rope), and feet (to support the body) and balance. body in order to maintain a position of support. Strong hand muscles and leg muscles of course provide a number of benefits for the body, namely; better body balance, improve posture, minimize the risk of injury, increase body metabolism, increase self-confidence (Fitriani, 2019). Learners with limited hearing need activities that improve posture, rhythm, orientation and balance (Arimbi, 2019).

This study involved 10 junior high school students from SLB-B YPPLB Cendrawasih Makassar, consisting of 5 male students, and 5 female students, the researchers involved male and female students because the number of students in ordinary schools is indeed different from public schools with many students, while being able to play the tug of war game will also be more optimal if played with many people. In each game session the researcher divided the groups by balancing the number of male and female students in each group and randomly assigned each game session. The intervention provided was a tug of war game which was played regularly for 4 weeks with a frequency of 3 times a week. The assessment norm still pays attention to the assessment according to the gender of the respondent. Measurement of arm muscle strength was measured using a handgrip dynamometer and for measuring leg muscle strength it was measured using a leg dynamometer. At each data collection, each respondent was given three opportunities to obtain the best results.

The results obtained in this study using a paired T test, each of which obtained significant results, namely for the measurement of arm muscle strength, there was a change in arm muscle strength after routine training interven-

tions with tug of war games, where the average respondent experienced an increase after exercise. with the average value before 25.28 kg increased to 29.94 kg, which means a change of 4.66 kg. Meanwhile, the leg muscle strength test also experienced positive changes, where the average respondent experienced an increase after tug of war with the average value before was 28.23 kg after the intervention exercise for 12 times increased to 34.35 kg, meaning that there was an average increase of 6.12 kg. In another relevant study related to physical activity in the form of games for deaf students, the research of (Prakarso, 2015) which raised the title "the application of traditional games to balance in deaf children in the lower class of SDLB Surabaya" although it was not explained in the publication how long the application of traditional games would take engklek is given, but the results of the study explain that there is a significant effect of the game intervention on improving the balance of the deaf SDLB students. Playing can develop stability and emotional control which is very important for mental balance (Prakarso, 2015) (Suhartini, 2011). Besides that, it can also develop the speed of the thought process. Based on several studies related to the form of exercise applied to children with special needs with the aim of improving the basic motor skills of children with special needs, it is always packaged in game models, both traditional games and modified games so that children with special needs in the process remain happy, happy and increase their confidence himself

CONCLUSION

From the results of this conclusion will be put forward some suggestions as recommendations for the implementation and development of research results. There is an effect of tug of war on the strength of the arm and leg muscles of students with special needs with hearing impairment.

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