Improved Early Childhood Balance Skills: Through Footboard Play and Shell Stretch
Mejora de las habilidades de equilibrio en la primera infancia: a través del juego de los estribos y el estiramiento de la concha

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Abstract. This research aims to identify: (1) the effect of play procedures on the increase in early childhood balancer, (2) the usefulness of the comparison of the effect between playing the footboard and shell stilts on the increase in early childhood balancing. This type of research is an experiment with the design of two groups pre-test and post-test. The population in this study was 100 children (PAUD) at Dharma Yoga Santi landfill. The sample in this study amounted to 72 children taken using purposive sampling criteria (1) certain children aged 5-6 years, (2) children who are active in school, (3) children are not sick, (4) male and female, (5) willing to follow the learning process (6) Able to follow all learning model programs that have been prepared, then divided into 2 groups. The instrument used to measure early childhood balancer is the Stork Stand Test. The information analysis method used is an independent sample t-test followed by a paired sample t-test. The results of the study proved that: 1) There was a significant influence of playing procedures on the increase in balancing by obtaining a significance value smaller than 0.05 (p <0.05). 2) There is a significant comparison of the influence between the boardwalk playing group and the shell stretching group on the increase in balancer, it was tested that the average balancing value in the boardwalk group was 86.94 while the average value in the bat sling group was 64.67 with an average difference in post-test of 22.27. With this, it can be concluded that the group given the treatment of playing the boardwalk has greater usefulness than the group playing shell stilts.
Keywords: Play, Stretch, Boardwalk, Balance.

Resumen. Esta investigación tiene como objetivo identificar: (1) el efecto de los procedimientos de juego en el aumento del equilibrio en la primera infancia, (2) la utilidad de la comparación del efecto entre el juego del estribo y los zancos de concha en el aumento del equilibrio en la primera infancia. Este tipo de investigación es un experimento con el diseño de dos grupos pre-test y post-test. La población de este estudio fue de 100 niños (PAUD) en el vertedero de Dharma Yoga Santi. La muestra en este estudio ascendió a 72 niños tomados utilizando criterios de muestreo intencional (1) ciertos niños de 5-6 años, (2) niños que son activos en la escuela, (3) niños que no están enfermos, (4) hombres y mujeres, (5) dispuestos a seguir el proceso de aprendizaje (6) capaces de seguir todos los programas modelo de aprendizaje que se han preparado, luego divididos en 2 grupos. El instrumento utilizado para medir el balanceo de la primera infancia es la prueba del rodal de cigüeña. El método de análisis de la información utilizado es una prueba t de muestra independiente seguida de una prueba t de muestra pareada. Los resultados del estudio demostraron que: 1) Hubo una influencia significativa de los procedimientos de juego en el aumento del balanceo al obtener un valor de significancia menor a 0,05 (p <0,05). 2) Existe una comparación significativa de la influencia entre el grupo de juego de paseo marítimo y el grupo de estiramiento de concha en el aumento del balanceador, se comprobó que el valor promedio de equilibrio en el grupo de paseo marítimo fue de 86.94 mientras que el valor promedio en el grupo de cabestrillo de murciélago fue de 64.67 con una diferencia promedio en la prueba posterior de 22.27. Con esto, se puede concluir que el grupo al que se le da el tratamiento de jugar en el malecón tiene mayor utilidad que el grupo que juega a los zancos de concha.
Palabras clave: Juego, Estiramiento, Paseo marítimo, Equilibrio.

Introduction

Learning has a significant position in childhood because the increase in character, mental, and intellectual behavior skills is built in the early years. The quality in the early childhood listed in the preschool period is the quality glass of the nation that is about to arrive. Early childhood learning is referred to as the bottom foundation for further children's learning (Bakken et al., 2017; Hedefalk et al., 2015; Suryadi et al., 2024). Early childhood learning is again a concern in Indonesia due to the early childhood period when a lot of data is easily absorbed so from that the stimulus given must be suitable and easily accepted by children.

Early age is a time of development and physical or motor growth (Nieminen & Sajaniemi, 2016; Wijaya et al., 2024). Physical growth is closely related to children's motor growth because physical growth will affect daily attitudes. Motor growth is coordinated through nerve centers, nerve muscles, and muscles for the process of developing physical

movement skills (Honrubia-Montesinos et al., 2021).

Children's motor growth is divided into 2, aggressive motor and fine motor. Aggressive motor is a child's skill in carrying out movements that hook large muscles, such as the body, arms, and legs (Ghassabian et al., 2016; Webster & Ulrich, 2017). Conversely, fine motor skills are a child's expertise in carrying out movements that involve small muscles with hand-eye coordination (Cohen et al., 2018; Lelong et al., 2021). Of the two motor types, which is very meaningful needed for children is aggressive motor growth (Veldman et al., 2016).

Aggressive motor growth is the growth of motion which includes balancing and coordination between limbs, such as crawling, walking, or running. Therefore, a balancing component is needed for early childhood to maintain movement skills in totality (Jain et al., 2022).

Balancing for early childhood is very meaningful in various activities that are tried by each child so it is good to balance what a person has so that he wants to be good at all

the physical activities he does. In line with the comments above, the balancer has various aspects that are very meaningful, so the balancing aspect here will function very large for children in carrying out various physical activities, both daily activities and branch activities according to their interests (Dobell et al., 2020; Edwards et al., 2017).

So it will be very meaningful if we look at the growth of a child from an early age, especially the skills that are fundamental to his development. Balancing control components include sensory data systems, synergistic postural muscle reactions, muscle strength, adaptive systems, and joint scope of motion (Hirata et al., 2018). The sensory data system deals with visual, vestibular, and somatosensory sensory. Visual input can influence human adjustment to changes in the immediate environment. Data that enters through visual sensory will be processed in the brain after which the musculoskeletal system will work synergistically to maintain body balance (Faber et al., 2022). Balancing in children needs to be improved so that the child's balancing ability can create maximum motor movements.

Based on the results of previous research Clements et al., (2017) said that balancing early childhood in carrying out physical activities is still not normal, this is due to the lack of position of teachers in distributing innovative movement programs in improving child balance. This is in line with research (Söntgerath & Eckert, 2015) That said, the stimulating aspects of low child balancing skills are the lack of teacher positions to train exciting balancers for children, as well as insufficient school facilities.

The growth of children's movements will certainly be much better if children are given a stimulus that links physical activity in the form of more varied and innovative movements, one of which is using equipment media. But in reality, based on some of the results of previous research, it was found that the body balancer owned by children is still not normal while balancing is needed to carry out their activities, which are all playing and linking physical and motor skills.

This was also proven when researchers made observations in September 2023 at PAUD Yogya Santi school, the principal explained that the balance of early childhood is still in the low category. Researchers obtained the latest information from the principal when children carried out a balancing test using a stork stand test with an average value of 8 seconds, this must be listed as the type of very lacking. Children at school often face falling during morning exercises that are tried every Saturday, especially when playing in the field, this makes parents and the school afraid of the development of their students. That is, children are still unable to control their body balance during gymnastics or when playing on the field. The balancing movement training model that has been applied is only monotonous, such as turning, clinging, swinging, walking on tiptoes, walking lightning, cycling, and so on. There has not been found a more varied and innovative model of balancing movement training. If this matter continues to be left until it will have a bad impact on the development of a child. This balancing

exercise is very meaningful to try in early childhood because it greatly affects the activities that children try every day, but this exercise must be tried repeatedly because children when learning new movements cannot directly carry it out, but it takes time and is accompanied so that children can hold their bodies not to fall and can move large muscles in their bodies. Fitri & Imansari, (2020) comment that children who have a balancing disorder tend to increase the use and structure of nerves such as problems with vision, deafness, bone disorders, and so on, the right method to train the balance of the child's body is by the method of carrying out games.

Edwards et al., (2017) Comment that play is very useful for maintaining balance, and by playing until the child's energy is to be channeled, thus play is needed in the child's life so as not to cause consequences in the future. In playing, equipment and facilities are needed to support the goals of the game can be achieved, one of the equipment that can train the balancer is to use shell stilts and walkways.

The shell stretching game is a game that uses coconut shells that have been split into 2 parts, after that the top of the middle of the coconut shell is given a hole to hook the rope, and the bottom is given a board or plywood so that it is not easily damaged (Maryanti et al., 2021). Next, the child stands on a coconut shell while holding a rope, then walks forward by transporting the rope to coincide with carrying the foot. When walking is not allowed to hold the ground, this stretching game can train balance and intensity. Not only that, when playing coconut shell stilts, you want to establish muscle contractions, especially basic and abdominal extremities so that muscle increase is established, so that coconut shell stretching games can be used as a balancing training program.

Conversely, another game model that can train the balancer is by using a walkway board (Azizah & Adhe, 2019). Walkway board equipment is thought to stimulate a balancer in children's movements (Vadilla & Damri, 2020). The boardwalk in this study was modified into a small wooden bridge without obliterating its original use, which is for walking, climbing, and crossing. This modified walkway board is a static type of walkway board from flat wooden boards with dimensions of 400 centimeters long, 15 centimeters wide, and 25 centimeters large. This board walkway is a portable board with a length of 100 centimeters per board. This board is a tool for training child balancers.

The boardwalk can not only train the balancer but with the boardwalk can develop other skills such as children being able to coordinate movements, and cognitive skills are also honed by the method of children thinking how the trick is so as not to fall when walking using the boardwalk. Through walking activities on the boardwalk, it is hoped that it can train the balance of children. Exciting activities formed from this walkway board media so that children do not feel burdened by the teacher's efforts to improve the child's body balancer so that

children will feel happy and rejoice in training balancers so that their motor skills can be achieved according to what is expected.

Based on the background that has been described earlier, the meaning of balancing for early childhood in everyday life, until the purpose of this research is to determine the effect of the shell stretching play model by playing the walkway board on the increase in early childhood balancer, and see the better effectiveness between the two play models to improve child balancing.

Research Methods

Research Design

This research method uses a type of quantitative research with a quasi-experimental approach through pre-test design and post test two group design. This experimental research used 2 different groups, namely the group that shared the treatment of playing shell stilts and the boardwalk playing group.

Research Participants

The population in this study is children (PAUD) at the Dharma Yoga Santi landfill. The population in this study amounted to 100 children. The sample in this study amounted to 72 children taken using purposive sampling criteria, with the following criteria: (1) certain children aged 5-6 years, (2) children who are active in school, (3) children are not sick, (4) male and female, (5) willing to follow the learning process (6) Able to follow all learning model programs that have been prepared, then divided into 2 groups. 36 children were given the treatment of playing stilts, and 36 children were given board games. This research has obtained approval from all illustrations that have filled out the statement of ability to be a research illustration and have fulfilled the provisions of the research code of ethics.

Research Procedure

The method of collecting information in this research is test and measurement. The instrument used to measure early childhood balance is the Stork Stand Test (Norambuena et al., 2020). The Stork Stand Test instrument has a validity value of 0.93 and reliability of 0.86 (Rinaldi & Yudanto, 2019). After that, the model treatment was shared, playing shell stilts and playing boardwalks 3 times a week for 4 weeks. Rahmawati & Sulistyawan, (2020) said that the education model through play media that was tried for 4 weeks was more efficient to increase early childhood psychomotor growth. And ended with taking the final test value or post test to measure the balancer after treatment.

Data Analysis

The method of information analysis used in this research using SPSS 24 is to use an independent sample t test and continued with paired sample t test. First, the prerequisite test was tried, the normality test and the homogeneity of the data.

Results

Normality Test

A normality test is performed to test whether the data has a normally distributed distribution or not. The calculation of data normality is carried out using the Kolmogorov-Smirnov test. The normality test results are shown in the table below.

Child group playing Boardwalk

Table 1.
Pre-Test and Post-Test Results Normality Test Data Group of children playing Titian Board

Data	Significance	P	Information
Pre-test Early childhood balance	0,05	0,164	Usual
Post-test Early childhood balance	0,05	0, 070	Usual

Based on a statistical analysis of normality tests that have been carried out using the Kolmogorov-Smirnov test, the pretest and post-test data of the group of children playing the boardwalk were obtained from the results of the normality test data of the significance value of p > 0.05, which means that the data is normally distributed, it can be concluded that all pre-test and post-test data in the group of children playing the boardwalk are declared normal.

Group of children playing with stilt shells

Table 2.
Normality Test Results Pre-Test Data Group of Children Playing Stretching Shells

Data	Significance	P	Information
Pre-early childhood balance test	0,05	0,173	Usual
Post-early childhood balance test	0,05	0,060	Usual

Based on a statistical analysis of normality tests that have been carried out using the Kolmogorov-Smirnov test, the pretest and post-test data of the group of children playing shell stilts were obtained from the results of the normality test data of the significance value of p > 0.05, which means that the data is normally distributed, it can be concluded that all pre-test and post-test data in the group of children playing stilts are declared normal.

Homogeneity Test

The homogeneity test is used to test the similarity of variance between the compared data. The results of the homogeneity test of pre-test and post-test data between the group of children playing boardwalks with the group of children playing stilts in the shell of this study are as follows.

Table 3.
Test results of homogeneity of pre-test and post-test data

	Group	F count	p	Information
Pre-early childhood balance test	Playing Boardwalk	0,252	0,617	Homogeneous
	Playing Stretching Shells			
Post-early childhood balance test	Playing oardwalk	0,502	0,481	Homogeneous
	Playing Stretching Shells			

The results of the homogeneity test to test the similarity of variance of pre-test and post-test data between the group of children playing boardwalk and the group of children playing stilt batok. Because the significance value is greater than 0.05 (p>0.05), it can be stated that the pre-test and post-test data between the boardwalk playing group and the child group playing shell stilts are homogeneous.

Test Effectiveness
Independent Sample t Test Results
Pre-Test

The results of the independent sample t-test on the pre-test data comparing the group of children playing board-walks with the group of children playing stilts are as follows:

Table 4.
Results of Independent Sample T-test Data Pre-Test

Data	Group	Mean	t count	p	Information
Early childhood balance	Playing boardwalk	68,13	0,590	0,557	Significant
	Play shell stilts	61,03			

Based on the results of the Independent Sample t-test analysis, the balance data obtained a calculated t-value of 0.590 with a significance value of 0.557. Because the significance value of 0.557 is greater than 0.05 (p>0.05), it can be concluded that there is no significant difference in balance between the boardwalk playing group and the shell stretching group at the time of the pre-test. This means that both groups had the same balance before treatment.

Based on the results of the analysis, the average balance value in the boardwalk playing group was 68.13 while the average balance value in the shell stretching group was 61.03. This means that the group of children playing on the boardwalk has a better average balance compared to the group of children playing on shell stilts.

Post Test

The results of the independent sample t-test on the post-test data comparing the boardwalk playing group with the shell stilt play group are as follows.

Table. 5.
Results of Independent Sample T-test Data Post-Test

Data	Group	Mean	t count	p	Information
Early childhood balance	Playing boardwalk	86,94	2,429	0,018	Significant
	Play shell stilts	64,67			

Based on the results of the Independent Sample t-test analysis, the balance data obtained a calculated t value of 2.429 with a significance value of 0.018. Because the significance value of 0.018 is smaller than 0.05 (p<0.05), it can be concluded that there is a significant difference in balance between the boardwalk playing group and the shell stretching group.

Based on the results of the analysis, the average balance value in the boardwalk playing group was 86.94 while the average balance value in the shell stretching group was 65.67. This means that the boardwalk playing group has a

better balance compared to the boardwalk playing group.

Paired Sample t-Test Results
Group of children playing board walkways

Table 6.
Results of Paired Sample t-test Group of Children playing boardwalk

Data	Group	Mean	t count	p	Information
Early childhood balance	Pre-test	68,13	3,950	0,000	Significant
	Post-test	86,94			

Based on the results of the analysis of the Paired Sample t-test balance data obtained a calculated t value of 3.950 with a significance value of 0.000. Because the significance value of 0.000 is smaller than 0.05 (p<0.05), it can be concluded that there is a significant difference in balance during the pre-test and post-test in the group of children playing the boardwalk. This means that there is a significant improvement in balance before and after treatment.

Group of children playing on shell stilts

Table 7.
Paired Sample t-test results Group of children playing shell stilts

Data	Group	Mean	t count	P	Information
Early Childhood Balance	Pre-test	61,03	1,642	0,111	Significant
	Post-test	64,67			

Based on the results of the Paired Sample t-test analysis, the balance data obtained a calculated t value of 1.642 with a significance value of 0.460. Because the significance value of 0.111 is greater than 0.05 (p > 0.05), it can be concluded that there is no significant difference in balance during the pre-test and post-test in the group of children playing shell stilts.

Discussion

Reviews of the results of this research share a further understanding of the results of the analysis of information that has been put forward. The review of the results of the analysis can be further described as follows:

The Effect of Play Methods on Improving Early Childhood Balance

Based on hypothesis testing, it is known that there is an influence of the procedure for playing shell stilts and footboards on the increase in early childhood balancers. Play procedures are efficient procedures to improve children's motor skills, one of which is from a balancing aspect. This finding is in line with some previous research Mujtahidin & Rachman, (2022) Saying that they created a way of playing stilts that can improve the balance of children. This discovery does not change with some facts (Sari et al., 2022) explained that playing on stilts for 4 weeks is an efficient playing procedure to improve balancing skills. This is because when playing stilts, children must walk on shells that are close to 10 centimeters in diameter so that a balancing response is needed to play them. Not only that, when playing shell stilts, you want to establish muscle contractions, especially basic and abdominal

extremities so that muscle increase is established, so that the traditional game of coconut shell stilts can be used as a balancing training program (Nugroho et al., 2023).

Conversely, the boardwalk also faces a significant increase in balance. Recent findings also support the hypothesis that modified walk-board play procedures can improve the balancing aspect of children (Surya et al., 2016). Having such properties can improve body coordination and also balance children. This matter is also in line with Firman et al., (2023) said that the boardwalk is a medium that can measure or train child balancers. In harmony with the statement (Robiah, 2022) Those who report that balancing exercises can be tried by resting on one foot, climbing on a boardwalk, walking on tiptoes straight ahead, or walking backward with your eyes closed. This walkway board is considered to be a piece of equipment that can stimulate balancing in walking.

The effectiveness of the difference in influence between playing shell stilts and boardwalks on improving early childhood balance

The results of the analysis showed that there was a significant comparison of the effect between the shell stilt group and the boardwalk group on the increase in early childhood balancer. The group given the procedure for playing the boardwalk was better than the group of shell stilts against the increase in early childhood balancer. This matter is supported by the results of previous research (Line et al., 2003) Who said that the boardwalk is an interesting body-balancing game for children because children face an increase after being given experiments using the boardwalk game. Therefore, it can be concluded that the innovative applied walkboard playing procedures can improve early childhood balancing. The use of footboards to train children's balancers is said to be interesting because this media has been modified so that children do not get bored easily. Children are also given the opportunity to carry out this board game alternately and other friends share enthusiasm so that children become more enthusiastic, confident, and aggressive motor children can grow well. Not only that, share research results Mukhlisa & Kurnia, (2020) Walking activities on the boardwalk greatly affect the balance of the child's body, this can be seen when the activity is more often tried children can control their sensitivity if directly wants to think that how is the trick so that he does not fall when carrying out the activity, not only It can also increase children's courage, and Distributing activity alterations to children so that they are not easily bored when carrying out their motor movements.

Conclusion

Based on the results of information analysis using the Independent Sample t-test and continued with the Paired Sample t-test until conclusions can be drawn in this research are: a) there was a significant increase in early childhood balancing before and after being given the treatment of playing stilts, and there was no significant increase in the group of children given the walkway board play model, b)

The group given the treatment of playing shell stilts has a better balance than the group of children who are given the footboard playing model.

With the results of this study, it is recommended for teachers or teaching staff to apply shell stretching games for early childhood in order to improve children's balance. However, future research may suggest developing a modern tool to improve early childhood balance.

Acknowledgments

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