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ANALYSIS OF THE EFFECT OF AUDIOLYFE STIMULATION ON CHILDREN'S APPETITE AND MOTOR AND SENSORY DEVELOPMENT

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ABSTRACT

Stimulation in childhood plays an important role in supporting a child's physical, mental and social development. One type of stimulation that is gaining popularity is Audiolyfe, which is sound-based stimulation. However, this stimulation still needs to be tested to determine whether it can affect changes in children, such as appetite and motor and sensory development. This study aims to evaluate the effect of Audiolyfe stimulation on children's appetite and motor and sensory development. The research method used was quantitative with a quasi-experimental approach, where data were collected through observation and questionnaires. Data analysis was conducted using descriptive statistics. The results showed that Audiolyfe stimulation had a significant effect on children's appetite and motor and sensory development. Children who received this stimulation experienced improvements in appetite and motor and sensory skills. The findings indicate that sound-based stimulation such as Audiolyfe can be an effective method to support children's appetite and physical development.

KEYWORDS *Audiolyfe stimulation, children's appetite, motor and sensory development*

INTRODUCTION

Childhood is a very important period in the process of human development. At an early age, children are in the golden age phase, where there is a significant developmental spike, which is not seen in previous ages. Children's development at this age is influenced by many factors, one of which is the stimulation received from the surrounding environment (Alini et al., 2020). Children who receive appropriate stimulation tend to experience better development compared to children who receive less stimulation. Stimulation is one of the important factors in supporting optimal child growth and development. Children who receive directed, regular, and early stimulation will develop faster than those who receive less or late stimulation. On the contrary, lack of stimulation can cause delays in development and inhibit children from developing their potential (Utaminingtyas, 2019).

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One type of stimulation, such as auditory stimulation, which involves the provision of certain music or sounds, has long been known to be able to exert an influence on the listener. Listening to music is often considered an activity that can have a positive impact, especially if applied in the right and appropriate way. Carefully selected types of music can stimulate and affect the brain and nervous system (Artanto, 2023). However, the extent to which audio stimulation has a significant influence on the increase in appetite and motor and sensory development of children is still not widely studied.

One of the innovations in audio stimulation is Audiolyfe, a sound wave-based therapy that aims to improve children's brain intelligence. Audiolyfi uses sound waves to help integrate the left and right brains in children. It is hoped that this approach can have a positive impact, especially in terms of increasing appetite and the development of children's motor and sensory abilities. Auditory stimulation is seen as an approach that has the potential to bring significant benefits in supporting children's development.

Previous research by (Rantina et al., 2020) showed that the stimulation provided by parents to children aged 0-6 years during the COVID-19 pandemic at home varied. This form of stimulation includes developmental exercises for children aged 0-1 years, the use of educational game tools, and the use of audiovisual media. Some of the forms of stimulation carried out include inviting babies to chat at the age of 0-1 years, playing in the yard, reading stories, coloring together, accompanying children when doing schoolwork, and worshipping with parents.

Meanwhile, another study conducted by (Murphy et al., 2015) tested the generalization of sensory, auditory, and cognitive learning in children with normal development. The results showed that the group of children who were trained, especially the older ones, experienced a significant improvement in the tasks given. Despite the improvement in various tasks, the results also show that sensory and cognitive training can improve learning on related tasks, such as visual digit range tasks. However, this learning did not affect language skills such as reading or phonological awareness, suggesting that the effects of training did not extend to all aspects of development.

The novelty of this study lies in the trial use of Audiolyfe stimulation, an innovative method based on sound waves, to test its effect on children's behavior. This research is expected to contribute to developing innovative stimulation methods to support children's growth and development. In addition, this study can provide a scientific basis for parents, educators, and child health practitioners regarding the use of sound-based stimulation as a non-invasive intervention that can help improve children's appetite and motor and sensory development. Therefore, the main objective of this study is to analyze the effect of audio stimulation on appetite as well as motor and sensory development in children.

The purpose of this study was to analyze the effect of audio stimulation on increasing the appetite of children who have difficulty eating. To measure the effectiveness of audio stimulation in supporting children's motor and sensory development, especially in children with developmental delays. And to provide a scientific basis for the development of sound-based stimulation methods as non-invasive interventions in supporting children's growth and development.

Meanwhile, the benefits of this study are to contribute to the scientific literature on the use of sound-based stimulation in supporting children's development, especially related to appetite and motor and sensory abilities. To guide parents, educators, and child health practitioners on the use of audio stimulation as an effective method to support children's growth and development. And to present alternative non-invasive interventions that can be applied to improve the quality of life of children with developmental delays or eating problems.

RESEARCH METHOD

The method used in this study is a quantitative method with a quasi-experimental approach. According to (Hastjarjo, 2019), quasi-experiments involve the manipulation of independent variables, where researchers deliberately provide certain treatments or interventions to see how they affect other variables. In this study, manipulation was carried out to understand the effect of audio stimulation on child development. The population of this study consists of children aged 6 months to 10 years who experience appetite problems or delays in motor and sensory development. The sample was selected using the purposive sampling method, and the total number was 30 children. Data were collected through direct observation and questionnaires filled out by parents or caregivers. The data were then analyzed with descriptive statistics to describe the child's initial condition and the changes that occurred after the intervention, as well as with inferential statistics to test the effect of Audiolyfe on the child's appetite and motor and sensory development. The purpose of the analysis was to see if there was a significant difference between the before and after treatment in the experimental group.

The hypothesis proposed is as follows:

H1: There is a significant effect of audio stimulation on children's appetite.

H2: There is a significant effect of audio stimulation on children's motor and sensory development.

RESULT AND DISCUSSION

RESULT

In measuring the effect of audio stimulation on children's appetite and motor and sensory development, researchers conducted preliminary measurements (pretest) before starting the intervention. After reviewing the measurement-related questions, the audio stimulation intervention was given to the children participating in the study. After that, a remeasurement (posttest) is carried out to see the changes that occur after the intervention.

Table 1. Descriptive statistical results from pretest and posttest that focus on children's appetite, based on assessments given by parents or caregivers. This table provides an overview of the differences that arise between pretest and posttest results, which can be used to assess how effective Audiolyfe interventions are in influencing children's appetite.

Table 1. Descriptive Statistical Results on Children's Appetite

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation

Pretest the child's appetite	30	50.00	80.00	67.0333	8.03219
Postest child appetite	30	70.00	95.00	81.5333	5.55681
Valid N (listwise)	30				

The results of the analysis showed before and after the intervention values that showed significant changes. In the pretest, which involved 30 children, the minimum score for appetite was 50, while the maximum score reached 80, with a mean value of 67.03 and a standard deviation of 8.03. After the Audiolyfe stimulation intervention, the post-test results showed an improvement. The minimum value of appetite rose to 70, while the maximum value reached 95, with an average of 81.53 and a standard deviation of 5.55.

The difference between the pretest and posttest results showed an increase in the average appetite of children after being given Audiolyfe stimulation, where this considerable average difference was also accompanied by a decrease in standard deviation, which means that there was a higher consistency in the posttest results. This analysis indicates that the intervention has a positive effect on increasing children's appetite.

Meanwhile, this study also evaluated the effect of audio stimulation intervention on children's motor and sensory development, the results of which are presented in Table 2 below.

Table 2. Descriptive Statistical Results on Motor and Sonori Development

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Child development pretest	30	45.00	75.00	57.8667	9.38353
Postest child development	30	60.00	90.00	74.6667	7.18395
Valid N (listwise)	30				

The results of descriptive statistical analysis of children's motor and sensory development before and after the intervention also showed a significant improvement. Based on the pretest, which was conducted on 30 children, the minimum value of child development was 45, and the maximum value was 75, with a mean value of 57.87 and a standard deviation of 9.38. After Audiolyfe stimulation intervention, the post-test results showed a significant improvement in child development. The minimum score for child development rose to 60, and the maximum score reached 90, with an average of 74.67 and a standard deviation of 7.18.

The difference between the pretest and posttest results illustrates an increase in children's motor and sensory development after being given audio stimulation. The average child development improved significantly, and the decrease in standard deviation in post-test results indicated that post-test results were more consistent

among participants. This analysis shows that audio stimulation has a positive effect on children's motor and sensory development.

The results of the descriptive statistical analysis showed that the intervention had a positive impact on the improvement of children's appetite as well as their motor and sensory development. However, to corroborate or reject the hypothesis proposed, further analytical tests are needed. Although a comparison of the mean pre-test and post-test results showed an improvement after the Audiolyfe stimulation intervention, it was important to run the Paired Sample T Test. Before doing so, it is important to check that the data follows a normal distribution. Referring to (Kaswari et al., 2023), a normality test was carried out to determine whether the dependent and independent variables in the regression model were normally distributed. The criteria used for the normality test are "if the significance value (sig) is greater than 0.05, the data is considered normally distributed. Conversely, if the sig value is less than 0.05, the data is considered not to follow the normal distribution." The results of the normality test can be seen in the following table.

Table 3. Normality test results

Tests of Normality

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Mr.	Statistic	df	Mr.
Pretest the child's appetite	.144	30	.114	.943	30	.109
Postest child appetite	.100	30	.200*	.969	30	.502
Child development pretest	.088	30	.200*	.978	30	.765
Post test of child development	.096	30	.200*	.968	30	.488

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

In the analysis of the normality test, considering that the sample size of this study is 30, the Shapiro-Wilk Test is a more suitable method to use. Based on the results obtained, the significance value (Sig.) for all variables, both pretest and posttest, on children's appetite and motor and sensory development showed a number greater than 0.05. Since all of these significance values are greater than 0.05, it can be concluded that the data from these variables are normally distributed. This means that the normality test requirements have been met so that further statistical analysis, such as the Paired Sample T-Test, can be performed to see significant differences between pretest and post-test results.

Once the data is declared normally distributed, the next step is to conduct a hypothesis test to find out if there is a significant influence on the intervention carried out. The hypothesis proposed in this study is as follows: the first hypothesis (H1) states that audio stimulation has a significant influence on children's appetite. At the same time, the second hypothesis (H2) states that audio stimulation has a significant influence on children's motor and sensory development.

To test this hypothesis, a Paired Sample t-test was performed. This test aims to determine whether there is a significant difference between the pretest and

posttest results after the intervention is carried out. "If the significance value (Sig.) (2-tailed) of the test results is less than 0.05, then the null hypothesis (H0) is rejected, and the alternative hypothesis (Ha) is accepted. This means that there is a significant influence on the interventions carried out. Conversely, if the significance value is greater than 0.05, then the alternative hypothesis (Ha) is rejected, and the null hypothesis (H0) is accepted, which means there is no significant influence (Rusmiati et al., 2022)." The following table displays the results from the Paired Sample T-Test used to determine whether a hypothesis is accepted or rejected.

Table 4. Test results T Paired samples

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Pretest child appetite - Postest child appetite	-14.500000	6.08418	1.11081	-16.77187	-12.22813	-13.053	29	.000
Pair 2	Child Development Pretest - Postest Child Development	-16.800000	7.86261	1.43551	-19.73595	-13.86405	-11.703	29	.000

Based on the results of the Paired Sample T Test shown in Table 4, it was found that the significance value (Sig. 2-tailed) was 0.000 for the two variables studied, namely children's appetite and children's motor and sensory development. Since this significance value is less than 0.05, the null hypothesis (H0), which states that there is no significant effect of Audiolyfe stimulation, is rejected. On the contrary, the research hypothesis that there is a significant influence is accepted.

Specifically, there was a significant difference in mean between pretest and posttest results. For the appetite variable, audio stimulation increased children's appetite with an average difference of 14.5 points. This shows that the intervention has a significant effect on increasing appetite. Similarly, in the variables of children's motor and sensory development, audio stimulation led to an increase with an average difference of 16.8 points between the pretest and the posttest.

DISCUSSION

The findings of the study show that audio stimulation has a significant positive influence on increasing appetite as well as motor and sensory development in children. First, the findings of the study have accepted the assumption that audio stimulation has a positive impact on children's appetite. This is understandable because auditory stimulation, used in the Audiolyfe program, can affect various cognitive and emotional aspects related to a child's eating behavior.

Auditory stimulation, as applied in the Audiolyfe program, can affect the cognitive and emotional aspects of the child related to appetite. This effect is related to mechanisms in the brain that regulate hunger and satiety, specifically through the work of the hypothalamus. Listening to music is directly related to increased food intake through mechanisms in the brain. Previous studies have revealed that the hypothalamus, the part of the brain that regulates energy balance and food intake, is affected by auditory stimulation. Certain music can stimulate the Ghre Hypothalamus, which plays a role in stimulating appetite through the ventral hypothalamus, which specifically controls food intake (Russo et al., 2017). Through the stimulation of music waves directed to this brain area, auditory stimulation programs such as Audiolyfe have the potential to play a role in helping children regulate appetite through the control of hunger and satiety signals.

The part of the hypothalamus known as the arcuate nucleus (or infundibular nucleus in humans) can receive peptides and proteins from the body through the blood-brain barrier. These peptides directly interact with neurons in the area, including neurons that produce neuropeptide Y (NPY) and agouti-related peptides (AgRP), which promote hunger and weight gain, as well as neurons that produce pro-opiomelanocortin (POMC) and CART, which suppress appetite and support weight loss (Austin & Marks, 2008).

In addition, certain music and auditory stimuli have been shown to affect mood, reduce stress, and promote positive psychological conditions (Rafi et al., 2023). This auditory stimulation has a particular influence on the amygdala area of the brain, which is responsible for the processing of emotions and feelings. The amygdala area, along with the orbitofrontal media cortex, plays a role in managing and processing a person's emotions, which may explain why music can directly affect mood (Lutfi et al., 2024). Listening to wave music can lower anxiety and help the body and mind become more relaxed. This calmer and more relaxed condition can create a more stable mood in the child, which in turn has the potential to improve appetite. Music, which can create emotional calm through its effect on the amygdala, indirectly supports increased appetite through a more positive and stable mood.

In more detail, food intake, which refers to the amount of food consumed, can be affected by various factors, both internal and external. Internal psychological factors such as mood, anxiety levels, and previous emotional experiences can influence how a child interacts with food. On the other hand, external factors such as the eating environment and social factors also play an important role in children's eating behavior. A comfortable eating environment and stimulation such as music can create a more pleasant atmosphere when eating, which can increase children's interest in food (Cui et al., 2021).

Music as a stimulus for the general environment can enrich the dining experience, helping children feel more comfortable and engaged when eating. The results of this study are in line with previous findings that show that music has a

significant influence on food intake. Research by (Lock et al., 2016) proves that music can affect a person's eating habits. In addition, research by (van den Tol et al., 2022) indicates that auditory stimulation, such as listening to certain types of music, can trigger physiological responses that play a role in regulating emotions and motivation to eat. The study found that listening to music can reduce emotion-triggered eating patterns after controlling hunger using standard snacks before listening sessions.

So, these findings provide additional support to the existing literature, which suggests that music-based interventions and auditory stimulation can effectively influence eating behavior. Therefore, audiological stimulation can be considered a promising intervention method to increase children's appetite, especially for those who have difficulty eating.

Meanwhile, the findings of the study have also accepted the assumption that audio stimulation has a positive impact on children's motor and sensory development, which can be explained through the auditory stimulation mechanism that stimulates neural pathways related to motor and sensory coordination. The Audiolyfe program relies on sound and music stimuli, serving to increase children's attention to external stimuli. This contributes to the improvement of children's motor responses.

In this mechanism, rhythmic patterns in music allow the human brain to extract periodic sequences known as beats, even when there is a pause or silence. Research by (Large et al., 2023) explains that humans can perceive beats at frequencies between 0.5 and 8 Hz, with optimal perception around 2 Hz, so this process helps children in developing motor skills.

From the point of view of motor development, auditory stimulation is closely related to movement coordination. Children exposed to music-based stimuli tend to show improvements in gross motor skills, including balance, coordination, and movement control. As revealed by (Burger et al., 2013), music or sound stimulation can improve the perception of time and rhythm, which are key components in coordinated movement. When listening to music with a certain rhythm, children automatically respond with synchronized body movements, which has the effect of improving motor skills.

In addition, music also plays a role in sensory development. Research by (Rusmawati et al., 2022) shows that sensory development training through music and movement provides a learning process involving aural, kinetic, and visual sensory modalities, as well as increasing musical intelligence through music instruction. Music creates aspects that support learning, improving children's self-discipline, concentration, and skills. The environment generated by music also helps to create a sense of security, reduce stress, and provide space for children to express themselves in ensemble groups.

So, these findings show that audio stimulation has a significant influence on children's motor and sensory development, which is consistent with previous research. Auditory stimulation can play a role in increasing brain activity, which supports the development of these two abilities and also strengthens neural connections related to sensory and motor perception.

CONCLUSION

The results of the study showed that audio stimulation had a significant influence on children's appetite and motor and sensory development. Children who received this stimulation experienced a clear improvement in appetite and motor and sensory abilities. Based on these results, Audiolyfe can be recommended as a beneficial stimulation method in supporting children's physical development, especially for children who experience appetite difficulties or developmental delays. This research provides new insights into the potential of sound-based stimulation and opens up opportunities for the development of similar methods to improve children's health and development.

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