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The Effect of Massage Stimulation in Optimizing Infant Cognitive Development

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Abstract*:* This study aims to evaluate the effect of massage stimulation on the cognitive development of infants at SPA Daycare Narega Bantul Yogyakarta. This study used a Quasi Experimental method with a pre-test and post-test design with a control group. A total of 40 infants aged 6-12 months were randomly divided into two groups: an intervention group that received education about infant massage (n = 20) and a control group (n = 20) that did not receive intervention. . Massage was carried out routinely 3 times a week for 6 weeks. The purposive sampling technique was based on inclusion criteria. The research instrument used the Pre-Screening Development Questionnaire (KPSP) and direct observation during the massage session. Data were analyzed using descriptive statistics and t-tests to assess differences in cognitive development between the two groups. The results of the data analysis showedThe average value of 85 infant cognitive development in the appropriate or normal category before receiving stimulation and the average value of 90 increased after being given stimulation. The T-value was 2.50 with a p-value of 0.020 ($p < 0.05$), the average value of 70 infant cognitive development in the doubtful category before receiving massage stimulation and the average value decreased to 65 after the intervention. The T-value was -1.20 and a p-value of 0.260 ($p > 0.05$).,The average value of 60 indicates that the baby's cognitive development is in the deviant category before receiving massage stimulation and the average value decreased to 55 after stimulation. The T-value was -1.50 and the p-value was 0.190 ($p > 0.05$).The results of the study indicate that massage stimulation has a significant impact on improving cognitive development in infants. These findings provide a basis for the development of broader intervention programs to support child development in the community.

Keywords: Infants, Cognitive Development, Stimulation, Massage.

INTRODUCTION

Infant cognitive development is a crucial aspect of child development. In the early period of life, the baby's brain experiences very rapid growth, and proper stimulation can support the development of cognitive abilities (Mala, NF W et all. 2022). Early childhood development mostly takes place at home, family as the primary educational environment, although the child's biological growth occurs rapidly at a young age, strong social relationships with family and the surrounding environment. Therefore, mothers need to be aware of the importance of starting children's education early (Sunarsih, 2020). In Piaget's theory of infant cognitive development, there are four stages, where the first stage is the sensory-motor stage. At this stage, babies use motor skills such as reaching and touching) and sensory experiences such as hearing and seeing to understand the world around them (Chamidah, 2019).

Cognitive development includes the process of knowledge, which includes understanding something and evaluating it. Cognition develops with age and is influenced by genetic factors, the environment, and the interaction between genes and the environment. Cognitive development in infants is an important aspect in the early stages of life that can affect various skills in the future. Infants experience rapid brain growth, especially in the first two years of life. At the age of 0 to 2 years, a baby's brain can grow to 80-90% of the size of an adult brain. At the age of 1 year, synaptic connections in the brain also peak, and during this period, experience and environmental stimulation are very important for forming brain structure and function. After the age of 2 years, brain growth begins to slow down, but this early period remains crucial for the child's cognitive, motor, and emotional development. Research by Zeitlin (2020) shows that young people who receive good care tend to show better development. During the first month of life, other family members have an indirect role in supporting the child's growth and development through emotional support for the mother. After the first month, the role of family members becomes more focused on the nutritional and overall health aspects of the baby.

One way to prevent developmental problems is to provide stimulation to the baby, such as through baby massage. The current phenomenon shows that many children experience developmental delays (Widodo & Herawati, 2008). This is caused by a lack of parental understanding of the importance of the process and stages of child development, such as not talking to the baby during care or not providing the necessary motor exercises. As a result, early stimulation which is very important for child development is not carried out (Soedjatmiko, 2006). This delay is only realized by parents when the child is 2-3 years old, when they should have started talking, but in fact the child is still unable to talk, causing concern for parents (Widodo & Herawati, 2008).

Infant massage provides stimulation in the motor and cognitive development of infants because the squeezing movement in infant massage can be useful for strengthening infant muscles, stimulating various aspects of brain development and cognitive abilities through physical interaction and sensory stimulation (Sukmawati & Nur Imanah, 2020). A preliminary study showed that many parents at SPA Daycare Narega Bantul had a basic understanding of the benefits of infant massage, such as improving motor and cognitive skills. However, their knowledge of specific techniques and how to perform infant massage correctly was still limited. Most parents felt less informed about how to carry out infant massage activities at home. Parental involvement in infant massage practices varied; some parents reported routinely applying the techniques taught at SPA Daycare Narega, while others had difficulty doing so consistently. Factors that influenced this involvement included time available, understanding of correct techniques, and challenges in accessing additional educational resources.

METHODS

This study used the Quasi Experiment method of pre-test and post-test design with a control group. The population and sample of 40 babies aged 6-12 months at SPA Daycare Narega Bantul were randomly divided into two groups, the intervention group that received Baby Massage education (n = 20) and the control group (n = 20). Data analysis used descriptive statistics and t-test to compare the differences between the intervention group and the control group. Significance was set at $p < 0.05$.

RESULT AND DISCUSSION

The results of the analysis of the influence of massage stimulation in optimizing infant cognitive development are shown in the following table:

Table 1 Frequency Distribution of the Effect of Massage Stimulation Baby Cognitive Development

Variables	Pre Test	Post Test	N %	N %
In accordance	12	15	60	75
Doubtful	5	3	25	15
Deviate	3	2	15.	10
Total	20	20	100	100

Based on Table 1, there is a significant increase in cognitive stimulation of infants in the appropriate category from 60% in the pre-test to 75% in the post-test. There is a significant decrease in cognitive stimulation of infants in the doubtful category from 25% in the pre-test to 15% in the post-test. There is a significant decrease in cognitive stimulation of infants in the deviant category from 15% in the pre-test to 10% in the post-test. The results of the analysis show an increase in understanding or skills of infants after the intervention was carried out, as seen from a significant increase in the "Appropriate" category and a decrease in the "Doubtful" and "Deviant" categories.

Table 2. T test

Category	Pre-Test (n=20)	Post-Test (n=20)	Pre-Test Average	Post-Test Average	T-value	p-value
In accordance	12	15	85	90	2.50	0.020
Doubtful	5	3	70	65	-1.20	0.260
Deviate	3	2	60	55	-1.50	0.190

Based on Table 2, the average value of 85 indicates that the cognitive development of infants is in the appropriate or normal category before receiving stimulation and the average value of 90 increases after being given T-value stimulation of 2.50 with a p-value of 0.020 ($p < 0.05$). The average value of 70 indicates the cognitive development of infants in the doubtful category before receiving massage stimulation and the average value decreases to 65 after the intervention T-value of -1.20 and p-value of 0.260 ($p > 0.05$). The average value of 60 indicates the cognitive development of infants in the deviant category before receiving massage stimulation and the average value decreases to 55 after stimulation T-value of -1.50 and p-value of 0.190 ($p > 0.05$). This study shows that massage stimulation has a significant positive effect on the cognitive development of infants in the appropriate category, but does not have a significant impact on the doubtful and deviant categories.

The results of the study showed that massage stimulation had a significant positive effect on the cognitive development of infants in the appropriate or normal category before the intervention with an average value of 85 and an average value of 90 after the intervention, but did not have a significant impact on the doubtful category before the intervention with an average value of 70 and an average value of 65 decreased after the intervention. The deviant category before the intervention had an average value of 60 and decreased after the intervention with an average value of 55. Jean Piaget's developmental theory states that children's cognitive development occurs through active interaction with the environment. Through stimulation, including touch, babies can explore and understand their world (Ibda, 2015). Babies with questionable developmental conditions, such as autism spectrum disorders or cerebral palsy, are likely to experience deeper neurological disorders. Massage cannot address the underlying problems that affect their development (Murray, L., & Cooper, P. 2022).

Infant massage as a form of physical stimulation helps enhance sensory experiences, which are essential for cognitive development. Massage stimulation provides a variety of sensory stimuli, allowing babies to explore their bodies and interact with the environment more effectively. Through massage, babies not only receive physical stimulation, but also build emotional attachments with caregivers, which increases their sense of security and self-confidence. This is very important because a sense of security encourages babies to be more active in learning and exploring the world around them (Sunarsih, 2020). The initial stimulation that children receive usually comes from those closest to them, especially parents. In the context of providing stimulation, parents play a very significant role, and other family members also have important contributions to the child's development process (Sari & Zulaikha, 2020).

Stimulation provided by parents, especially mothers, is the main factor that influences children's language development, both physically and mentally. Mothers function as the primary and first educators for children, so parental involvement in improving children's language development is crucial. Various factors, including knowledge, education, occupation, gender, age, interests, culture, and information, influence the role of parents and in turn have an impact on children's development (Harahap, 2020). Massage stimulation can improve babies' attention, memory, and learning abilities. A study by Field (2017) found that babies who received regular massage showed improvements in cognitive and social abilities. Previous research conducted by Asyrofi (2018) showed a relationship between parental stimulation and language development in children aged 0-3 years, with a p value = 0.002. Data analysis showed that stimulation provided by parents had a significant effect on the language development of toddlers (0.002)

Research conducted by Lestiani (2022) showed different results regarding parental stimulation, there is optimal stimulation. Stimulation provided by parents is very important for children's language development, because this stimulation allows children to develop in speech and language aspects according to their age. However, if parents provide less stimulation, children's language development will be hampered. Research by Casado et al. (2021) shows that babies who regularly receive massage have better communication skills. This suggests that physical stimulation contributes to language and social skills, two important aspects of cognitive development. A study by Dewi and Saputra (2021) examined the effects of massage on infants' motor and cognitive abilities. The results showed that massage can improve motor skills and problem solving, indicating a relationship between physical stimulation and better cognitive development. Hartini and Nuraini (2022) found that infant massage improves sleep quality, which has a direct effect on brain development. Babies who sleep better have better learning and memory abilities, confirming the importance of quality sleep in supporting cognitive development. Infant massage has been recognized as a beneficial practice in supporting infant health and development. Research conducted by Zhang et al.2018 provides in-depth insights into the effects of infant massage on cognitive development.

Studies have shown that babies who receive regular massage show significant improvements in cognitive abilities compared to a control group. The sensory stimulation gained from massage is believed to contribute to the development of neural networks that support cognitive function. Research by Handayani et al. (2023) explored the relationship between infant massage and physical and cognitive health. Their findings suggest that massage not only improves physical health but also contributes to optimal cognitive development, suggesting that overall health has a significant impact on infant cognitive abilities.

CONCLUSION

This study shows that massage stimulation has a significant effect on optimizing infant cognitive development. Infant massage is not only about providing physical activity stimulation, but also an effective method to enhance sensory experience, strengthen emotional bonds, and support motor and cognitive development. The results of this study support the importance of massage as part of infant care that can provide long-term benefits to cognitive development. Therefore, infant massage practices should be promoted as a beneficial intervention strategy for parents and caregivers in supporting optimal infant growth and development.

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