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THE EFFECT OF IMPLEMENTING BABY SPA ON THE DEVELOPMENT OF BODY LENGTH OF INFANTS AGED 3–6 MONTHS IN INDEPENDENT MIDWIFE PRACTICE IN REJANG LEBONG DISTRICT

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Abstract

Background :The infant growth period is a critical stage that determines the quality of a child's physical, cognitive, and social development in the future, with the golden age occurring at 1–12 months of age requiring adequate nutritional intake and consistent stimulation. The problem of stunting remains a global health concern, with a national prevalence of 19.8% in Indonesia in 2024, impacting brain growth, cognitive function, and nutritional status of children. **Objectives :** This study aims to assess the effect of baby spa on the body length of infants aged 3–6 months at the Independent Midwife Practice in Rejang Lebong Regency. **Method**: This type of study is a quasi-experimental study with a one-group pretest–posttest design, involving 21 infants selected purposively. The baby spa intervention was given twice a week for four weeks, and body length measurements were taken before and after the intervention **Results:** . The results showed an average increase in body length from 67 cm to 68.957 cm, with a Wilcoxon test Z = -4.029, p = 0.000, indicating a significant difference. Baby spas have been shown to improve muscle coordination, whole-body movement, and neuromotor stimulation, positively impacting infant growth, appetite, and nutritional status.**Conclusion:** This study concluded that baby spas are an effective method for supporting infants' physical growth in early life.

Keywords*: Baby spa*; Baby Growth; Body Length

BACKGROUND

The infant development period is an essential stage that determines the quality of growth and development in the subsequent phases. The golden age, or "golden age," occurs between 1 and 12 months of age, known as the most critical, irreversible, and short-lived period. During this stage, infants are highly sensitive to environmental stimuli. To support their growth and development, babies require adequate nutrition and regular stimulation. In addition to being a time of physical growth, this period also lays the foundation for the formation of a child's character and personality later in life[13].

According to a WHO report, the Southeast Asia Region (SEAR) has one of the highest prevalence rates of growth and developmental disorders in toddlers. Indonesia is among the countries with the highest prevalence rate, at 28.7%, and ranks third in the region[4]. Stunting remains a global health challenge and is a key target of the WHO's 2025 reduction targets. Indonesia is following up on this commitment through the implementation of the National Medium-Term Development Plan (RPJMN) and a data-driven stunting reduction acceleration program. Based on the 2024 Indonesian Nutritional Status Survey (SSGI), the national prevalence of stunting was recorded at 19.8%, slightly lower than the national target of 20.1%[12].

In the short term, stunting can cause impaired brain growth, reduced intellectual abilities, and metabolic disorders that can hinder bodily functions. In the long term, individuals experiencing stunting are at higher risk of decreased immunity, metabolic diseases, cardiovascular disorders, learning difficulties, and impaired cognitive function. Thus, stunting not only impacts physical growth in children but also affects all aspects of development, including cognitive development, gross and fine motor skills, language, and socio-emotional skills[4].

Between the ages of 0 and 2, children experience rapid development, encompassing physical, cognitive, emotional, and social aspects, requiring intensive attention and monitoring. Adequate nutritional needs, appropriate environmental stimulation, and warm and loving interactions between children and parents are key factors in supporting optimal development. Good nutrition not only plays a role in physical growth but also contributes to brain development and cognitive function. Furthermore, the mother's health during pregnancy, genetic factors, and the parents' socioeconomic status and education level also influence the quality of a child's growth and development during this early period[11].

The Indonesian Ministry of Health recommends baby spa therapy as a method to support a baby's physical growth, ensuring their weight and height remain within a healthy range. This activity is believed to help optimize muscle and joint function through targeted movements, enabling babies to move more agilely and develop better body coordination. The stimulation provided during the baby spa treatment also contributes to the development of a baby's motor skills and balance. Furthermore, children who are accustomed to water activities from an early age, such as swimming, generally demonstrate faster motor development and better physical adaptation abilities than their peers[9].

Previous research literature indicates that baby spa interventions influence children's somatometric growth indicators, including body length and weight. Following baby spa therapy, muscles experience optimal hypertrophy, joints operate at maximum efficiency, longitudinal growth is accelerated, and the body achieves a higher level of flexibility. Specifically, movement in an aquatic environment provides neuromotor stimulation to all parts of the infant's body, from the lower and upper limbs to the head region, even though these movements have not yet achieved mature coordination[5].

The results of a study on babies who participated in the program at the Salsabila Mom & Baby Spa Clinic, Tangerang City, in 2023 showed that 30 babies (50.0%) underwent baby spa treatments regularly, while the other 30 babies (50.0%) attended baby spa treatments with irregular frequency. Of the total sample, physical growth of babies aged 6–12 months increased in 37 babies (61.7%). Statistical analysis showed a p value = 0.008 (<0.05), which indicates a significant relationship between the frequency of baby spa treatments and the physical growth of babies aged 6–12 months. The odds ratio (OR) value of 5.231 indicates that babies who regularly attended baby spa treatments had a 5.231 times higher chance of experiencing increased physical growth compared to babies who did not attend regularly[3].

The results of a preliminary survey conducted by the Rejang Lebong District Health Office in 2023 show data on toddler length measurements and weight measurements conducted between December 2022 and February 2023. Of the total 24,092 toddlers, 17,437 were measured and weighed. Data analysis revealed that 14,461 toddlers experienced an increase in length and weight, 65 maintained their weight, while 767 experienced a decrease. Interviews with mothers indicated that many were unaware of

baby spa therapy as a method of stimulating infant growth, particularly in increasing length, apart from supplementary feeding programs. Most mothers also did not understand the benefits of baby spa in supporting children's length growth. Based on these conditions, this study was designed to assess the effect of baby spa on the length of infants aged 3–6 months at the Independent Midwife Practice in Rejang Lebong District.

METHODS

This study used a Quasi Experiment with a one-group pretest–posttest design without a control group to determine the effect of Baby spa on the body length of infants aged 3–6 months. The study population was all infants aged 3–6 months in the working area of the Independent Midwife Practice in Rejang Lebong Regency, with a sample of 21 infants selected by purposive sampling based on inclusion and exclusion criteria. The research instruments included baby scales, a baby pool, a neck ring, toys, swimsuits, olive oil, observation sheets, and SOPs for implementing the intervention. Data collection was carried out by measuring body length before and after the intervention. Baby spa was given twice for four weeks with a frequency of once every two weeks. Data analysis used the Wilcoxon test to see changes in body length before and after the intervention. This study has obtained ethical approval from the Health Research Ethics Committee of the Bengkulu Ministry of Health Polytechnic, and each respondent has signed an informed consent form before the study was conducted.

RESULT AND DISCUSSION

Table 1. Frequency Distribution of Gender and Age of Babies Who Received Baby Spa

	Frequency (n)	Percentage (%)
Gender		
Woman	10	47.6
Man	11	52.4
Total	21	100
Age		
3 months	11	52.4
4 months	3	14.3
5 months	7	33.3
6 months	0	0
Total	21	100

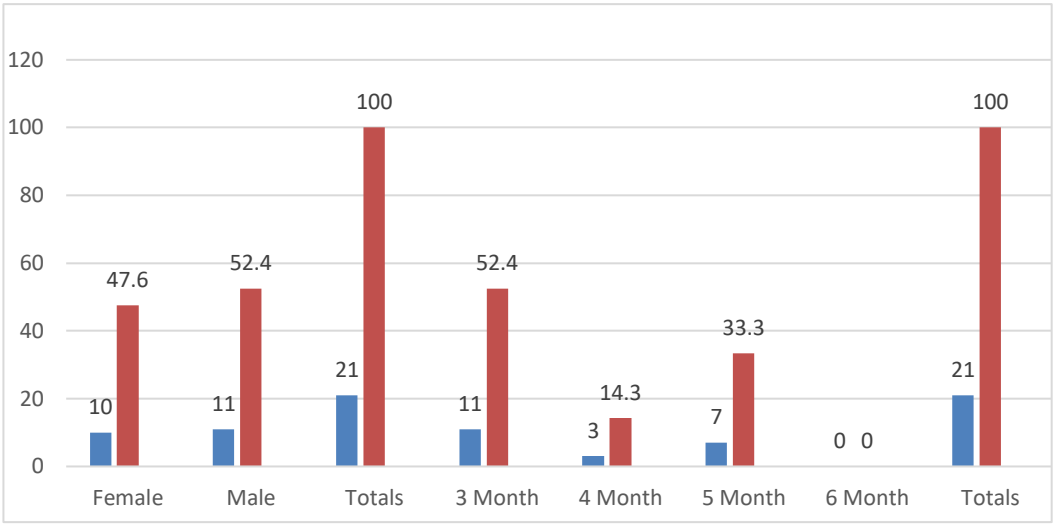

Figure 1. Frequency Distribution of Gender and Age of Babies Who Received Baby Spa

Respondent characteristics in this study were the age and gender of the babies who received Baby Spa. Based on Table 1, it is known that the age of the majority of the babies in the intervention group was 3 months old (52.4%), while the gender of the babies was mostly male, with 11 babies (52.4%).

Gender plays a role in a child's physical development, from reproductive aspects to overall growth, with clear variations between girls and boys. Boys generally show a greater acceleration in physical growth after entering puberty, while girls tend to experience earlier physical development before puberty. Although gender is considered an important variable in gross motor development, its impact on this aspect is not very significant according to existing theories[8].

According to Dr. Utami Roesli, SpA, IBCLC, CIMI, infant massage still provides many benefits and is ideally performed regularly, at least once a month. Specialists recommend that massage be performed after the baby is three months old, when their physical condition is no longer too weak to undergo massage. Infant massage is intended for babies weighing 2,500-4,000 grams. In general, massage for premature babies requires verification that the baby's condition is stable before being performed. Bernie stated that premature babies' organs have not yet developed optimally. Premature babies are often prone to instability, illness, infection, and other similar conditions[6].

Table 2. Average body length of infants aged 3-6 months before and after intervention

Variables	Min	Max	Mean	Elementary School
Pre-Test	64.5	70	67	1,7958
Post Test	66.7	72.1	68,957	1.8239

The results of the analysis showed that the average body length of babies before Baby spa (pretest) was 67 cm with a minimum value of 64.5 cm, a maximum of 70 cm, and a standard deviation of 1.7958. After Baby spa intervention (posttest), the average body length of babies increased to 68.957 cm with a minimum value of 66.7 cm, a maximum of 72.1 cm, and a standard deviation of 1.8239. This average increase of 1.957 cm indicates that after Baby spa intervention, there was an increase in the body length of babies aged 3–6 months, so descriptively it can be concluded that Baby spa has the

potential to have a positive influence on the growth of baby's body length.

Development refers to progress in gross motor skills, fine motor skills, speech and language skills, as well as socialization and independence, accompanied by greater complexity in body structure and function. Gross motor skills are influenced by large muscle skills, including standing, sitting, and walking, while fine motor skills, such as grasping objects with the index finger and thumb, rely on fine nerve skills. Physical activities that require balance and body coordination are part of gross motor development, which is influenced by large muscle movements, both partially and completely, such as walking, jumping, and running. Baby spa is one approach to accelerating a baby's motor development through swimming and massage exercises, which stimulate the baby's motor activity. Of course, the massage also fosters a loving and affectionate relationship[2].

Research conducted by(Prastwi et al., 2023) showed that a baby spa intervention of four sessions in one month with one-week intervals contributed to an increase in infants' body length. Analysis of the intervention results revealed variations in the increase in body length according to the infant's age. In 6-month-old infants, the average increase in body length was recorded at 2 cm; in 7-month-old infants it increased by 1.5 cm; in 8-month-old infants it increased by 2 cm; in 9-month-old infants it increased by 1.5 cm; in 10-month-old infants it increased by 1.3 cm; and in 11-month-old infants it increased by 1.1 cm. These findings indicate that baby spa has a positive effect on body length growth, with a tendency for more significant increases in younger age groups compared to older age groups, indicating that stimulation in the early stages of life plays an important role in supporting optimal growth.

In line with(Mildiana, 2021), of the 22 babies who regularly underwent baby spa, most had good nutritional status, namely 12 babies (54.5%), while 10 babies (45.5%) showed improvement in nutritional status. In the 14 babies who did not regularly attend baby spa, almost half experienced a decline in nutritional status, namely 6 babies (42.9%), and 5 babies (35.7%) had good nutritional status. Data analysis was carried out using the Chi-Square test through computer software with a significance level of 5%. The test results showed that the frequency of baby spa was significantly related to the nutritional status of babies aged 9–12 months at Griya Sehat Mombykids, Sambong Village, Jombang District, Jombang Regency, with a p value = 0.006 (<0.05). This indicates that increasing the frequency of baby spa is positively correlated with the nutritional status of babies in that age group.

The ages of 3 to 12 months are a crucial period for babies to receive stimulation through baby spa treatments, as this is the stage where physical growth and gross motor development significantly accelerate. At 9–12 months, babies are introduced to foods with a variety of textures appropriate to their developmental stage, but appetite often decreases, resulting in inadequate nutritional needs. As babies grow older, their nutritional needs should increase. Regular baby spa treatments are expected to increase appetite, support weight gain, and help achieve good nutritional status. Baby spa treatments performed twice a week are considered routine because they can improve blood circulation, which plays a crucial role in accelerating a baby's physical growth according to their age[7].

Table 3 Effect of Baby Spa Before and After Intervention on the Body Length of Babies Aged 3-6 Months

Variables	n	Min	Max	Mean	Elementary School	Z	p-value*
Pre-Test	21	64.5	70	67	1,7958	-4,029	0,000
Post Test	21	66.7	72.1	68,957	1.8239		

*Wilcoxon

The results of the analysis showed that before the Baby spa intervention (pretest), the average body length of babies was 67 cm with a minimum value of 64.5 cm, a maximum of 70 cm, and a standard deviation of 1.7958. After the Baby spa intervention (posttest), the average body length increased to 68.957 cm with a minimum value of 66.7 cm, a maximum of 72.1 cm, and a standard deviation of 1.8239. The Wilcoxon test results obtained a Z value = -4.029 with a p-value = 0.000 ($p < 0.05$), which indicates a significant difference between body length before and after Baby spa. Thus, it can be concluded that Baby spa has a significant effect on increasing the body length of babies aged 3–6 months.

Growth can be understood as a quantitative process that reflects an increase in the size, number, and complexity of cells, tissues, organs, and the body as a whole. These parameters are generally measured using body weight (grams, kilograms) and length or height (centimeters, meters). Body development does not occur independently but is influenced by the interaction of internal and external factors. Internal factors include genetic components that determine an individual's biological potential, while external factors include environmental conditions, nutrition, and consistent stimulation, which can facilitate optimal growth[1].

Infant growth can be evaluated through objective parameters, such as weight gain, length, and head circumference, which reflect overall physical development. Physiologically, growth begins to appear from the 7th to 10th day after birth, with infants typically doubling their birth weight by 4–5 months. Internal factors, particularly genetics, play a fundamental role in determining the biological potential for growth, while external stimulation, such as baby spa treatments, can maximize this process. Baby spa therapy provides sensory and motor stimulation that stimulates the baby's muscles and joints, improves blood circulation, and supports the metabolic activity necessary for optimal growth. The combination of genetic factors and regular stimulation through baby spa treatments significantly contributes to the acceleration of weight gain, length gain, and overall physical development of the baby[2].

Kurniawati et al. (2021)reported that the application of baby spa has a positive effect on the growth of infants' body length. Based on measurement data, the average infant body length before the intervention (pretest) was recorded at 60.9 cm with a standard deviation of 3.3, while after the application of baby spa (posttest), the average increased to 62.4 cm with a standard deviation of 3.1. Statistical analysis showed a p value = 0.001 with a 95% confidence interval (-1.902 to 1.098), which indicates a statistically significant increase in infant body length after the intervention. These results indicate that stimulation through baby spa contributes significantly to the acceleration of infant body length growth.

Stimulation through baby spas can trigger the release of endorphins, which play a role in supporting infant growth by stimulating nerves in the digestive tract. This activity increases a baby's appetite, which positively impacts immunity, sleep quality, and

accelerated physical growth. Providing appropriate stimulation during growth is crucial, and baby spas are an effective method. Babies who regularly receive baby spas show significantly greater gains in weight, length, and head circumference than their peers who do not receive these treatments. The motor movements performed during baby spas, including movements similar to swimming exercises, help train muscles, improve body coordination, and support overall physical development[3].

A report from the World Aquatic Babies & Children Network indicates that babies who receive stimulation through baby spas experience significant growth improvements. This stimulation has been shown to stimulate babies' appetites, which in turn leads to optimal weight and length gains. Comparisons with similarly aged infants who did not receive baby spas showed that the intervention group experienced better physical growth, reflecting the positive effects of baby spas on early childhood development (World Aquatic Babies & Children Network, 2016;[10].

Statistical analysis using the Mann-Whitney test showed a p-value of 0.004 (<0.05), indicating a significant difference between the effects of baby spa and baby massage on infant growth. These results confirm that baby spa is more effective in stimulating infant growth, particularly in increasing body length. During a baby spa session, all parts of the baby's body move and receive exercise, from the legs and arms to the head. This activity improves the baby's ability to coordinate their muscles, as movement in water with a low gravity effect allows the baby to move more freely and optimizes the work of all muscle groups. Procedurally, a baby spa session begins with a series of gentle massages before continuing with swimming activities designed to support overall physical development[1].

Researchers assume that Baby spa positively contributes to the growth of infants' length. This activity is believed to stimulate muscles and joints thoroughly through structured motor movements, including swimming-like exercises, thereby improving the baby's coordination and flexibility. Regular stimulation also likely triggers the release of endorphins, which play a role in improving the baby's appetite, sleep quality, and endurance, thus supporting overall accelerated physical growth. Researchers assume that the interaction between an individual's biological potential and external stimulation through Baby spa is a crucial factor in maximizing the physical and motor development of infants in the early stages of life. This activity not only stimulates physiological growth but also has a positive effect on the baby's motor skills and overall coordination abilities, making it an effective intervention method in supporting optimal growth and development in early childhood.

CONCLUSION

Baby spa intervention has a significant effect on increasing infant height, with statistical tests showing a p value of 0.000 ($p < 0.05$), thus the research hypothesis is accepted. Baby spa activities play a role in neuromotor stimulation, muscle coordination, and increased whole body movement that supports optimal physical growth. These findings indicate that routine implementation of Baby spa can be an effective strategy to support infant growth and development in the early stages of life. It is recommended for health workers, especially midwives, to provide education and guidance to parents regarding Baby spa practices as growth stimulation, through counseling, direct practice, and other health programs.

COMPETING INTERESTS

All authors declare that they have no competing interests related to this study.

AUTHOR'S CONTRIBUTION

Indah Fitri Andini conceived and designed the study, performed data analysis, and prepared the manuscript draft. Farida Esmiati was responsible for data collection, while Rustam Aji conducted data analysis and provided critical revision of the manuscript.

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