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The Effect of Oral Stimulation on the Ability to Suck BBLR Babies in the Nicu Room of Toto Kabila Hospital

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ABSTRACT

Babies with BBLR are unable to breastfeed directly from the bottle or breast after birth due to low muscle tone, immature oral motor control, and poor sucking, swallowing, and breathing coordination due to weak sucking reflexes. The purpose of the study was to determine the effect of oral stimulation on the ability to suck BBLR babies in the NICU Room of Toto Kabila Hospital. The quantitative research method with a pre-experiment design is one group pre-test and post-test design, the population of this study is all BBLR babies, the research sample is 18 infants with accidental sampling techniques that meet the sample criteria, the research instrument uses EFS (Early Feeding Skill) observation sheets and oral stimulation SOPs, the data is analyzed with the Wilcoxon test. The results of the study were obtained before being given oral stimulation, the baby's ability to suck was completely devoid of 18 respondents (100%) with an average of 8.78 and after being given oral stimulation, the majority of babies' sucking ability had a suction reflex of 14 respondents (77.8%) and no suction reflex as many as 4 respondents (22.2%) with an average of 11.72, and p-value = 0.000 (≤ α 0.05). It can be concluded that there is an effect of oral stimulation on the ability to suck BBLR babies in the NICU Room of Toto Kabila Hospital. Therefore, hospitals are expected to make oral stimulation the standard of nursing care for BBLR babies with suction reflex problems.

INTRODUCTION

Newborn is a period of life (0–28 days), during which there are significant changes in life in the womb. Babies under one month are at high risk of developing health problems that can be fatal if not treated properly (Sihombing et al., 2024). Low birth weight (BBLR) according to *World Health Organization* (WHO) is defined as a birth weighing < 2500 grams. Low birth weight is caused by stunted fetal growth and prematurity.

The World Health Organization (WHO) said that around 15% to 20% of the number of births in the world are included in the BBLR category, which is equivalent to around 20 million cases every year. In 2020, about 14.7% of all births in the world were BBLR cases. The highest incidence rate of BBLR was recorded in South Asia, reaching 24.4%, while in other Asian regions it ranged from 6.0 to 12.2% (WHO, 2023). The prevalence of BBLR in Indonesia was 12.58% in 2021, while according to the results of the Directorate General of Public Health in 2021, of the 81.8% of babies who were reported to be overweight, as many as 6.9% were born with BBLR (Ministry of Health of the Republic of Indonesia, 2022).

Data from the Gorontalo Provincial Health Office in 2023 shows that the Neonatal Mortality Rate (AKN) in Gorontalo Province reached 4.1 per 1000 KH with a total of 76 neonatal deaths. The main cause of neonatal mortality with the highest is caused by BBLR and Prematurity with 48 cases (Gorontalo Health & Provincial Office, 2023.), while specifically in Bone Bolango Regency, 245 cases of babies with low birth weight (BBLR) were recorded, with 102 of them having to be referred. The surge in BBLR in 2024 is a particular concern, as it has almost doubled from the previous year (Bone Bolango Health Profile, 2024).

One of the efforts to help is by oral stimulation by giving oral motor exercise or oral motor which is a movement of muscles that covers the oral cavity area and starts from the jaw, teeth, tongue, palate, (palate), lips and cheeks. Oral feeding is a complex task for premature babies. Unlike full-term newborns, most babies born prematurely are unable to directly breastfeed from the bottle or breast after birth due to low muscle tone, immature oral motor control, and poor sucking, swallowing, and breathing coordination (Mashad et al., 2021).

Weak sucking reflex in newborns can affect the growth and development of babies such as delayed food consumption or oral breastfeeding with independent ability, no weight gain, the occurrence of malnutrition, babies with weak sucking reflexes cannot receive enough fluids, so it can cause dehydration. In addition, with a weak sucking reflex, babies can experience developmental delays such as motor delays and speech development (Insyirah et al., 2025).

Various intervention techniques have been used to facilitate oral feeding in premature babies, the most common of which are sensory and motor interventions including one of them is oral stimulation support. Oral stimulation is an oral motor stimulation for 5 minutes with 8 movements that is thought to provide assistance in strengthening movements in the lips, cheeks, jaw and tongue which is carried out for 7 days (Shaki et al., 2022).

Research shows that while oral stimulation programs accelerate the transition from tube feeding to oral feeding in premature babies, the success of oral feeding has been seen from a new perspective. Over the past 16 years, several studies have provided additional evidence on the benefits of this program for early feeding, reducing the transition period from tube feeding to oral feeding, shortening the length of hospitalization, and improving breastfeeding rates (da Rosa Pereira et al., 2020).

A preliminary survey conducted in the NICU room of Toto Kabila Hospital obtained data on the number of low-birth weight babies (BBLR) during 2023 as many as 166 cases and in 2024 as many as 179 BBLR data From May to July 2025 as many as 36 babies, during the researcher's service in the NICU room many babies with BBLR experienced problems in oral feeding. Babies born with BBLR are at risk of disorders in the nervous system, immaturity in the ability to suck in BBLR babies which will result in slow growth and development compared to children born with normal birth weight. Based on interviews with nurses in the NICU room, it was determined that oral stimulation had never been carried out for babies with BBLR and oral stimulation therapy had not been socialized to the baby's parents. The results of observations on September 08 to 12 on 7 babies were obtained as many as 5 of them had NGT hoses installed and had difficulty sucking.

RESEARCH METHODS

The design of this study uses a pre-experimental quantitative approach through the one group pre and post test design approach, which is an experimental research that uses one group where before the intervention is given, a test will be carried out first on the ability to suck low birth weight babies, then oral stimulation intervention will be given and after that the ability to suck low birth weight babies will be tested again which will then be analyzed the provision of the intervention. This research has been conducted in the NICU Room of Toto Kabila Hospital, Bone Bolango Regency. The time for this research has been conducted from November 20-December 19, 2025.

Data Collection Techniques

Primary data

Primary data is data that is directly obtained from the first source at the research location by observing and using questionnaire research instruments answered directly by the baby's parents to determine the baby's sucking ability and the baby's oral stimulation ability.

Secondary data

The secondary data in this study is to use data from book and journal references related to the provision of oral stimulation on the ability to suck babies with low birth weight.

Data Analysis Techniques

Univariate Analysis

Data analysis is the process of systematically searching and compiling data obtained from the results of interviews, field notes, questionnaires and documentation by organizing data into categories, describing it into units, synthesizing, organizing it into patterns, choosing more important ones and making conclusions (Hanif, 2023).

Univariate analysis is an analysis that aims to determine the frequency distribution of each research variable. In this study, the analysis was the distribution of frequency and percentage of respondent characteristics (gender and age of the baby) and the ability to suck the baby before and after oral stimulation.

Bivariate Analysis

Bivariate analysis aims to analyze only two variables. To find out the relationship between one variable and another (Indarwati et al., 2020.) This analysis was carried out to determine the influence of two variables, namely independent variables (oral stimulation) and dependent variables (BBLR baby's ability to suck). Before conducting bivariate analysis, the researcher conducted a data normality test using the Shapiro Wilk test because the number of samples in this study was <50 people, which was 18 babies. It was obtained in the Shapiro Wilk test that the data were not normally distributed, namely the significant value of *the oral stimulation pre-test* 0.003 and *the post-test* of oral stimulation 0.000, which showed that both values were <0.05 meaning that the data was not normally distributed because the data was called normally distributed if indigo was significant or p >0.05 so that the researcher could not use the parametric *paired t-test* statistical test, but can use an alternative test, namely the non-parametric Wilcoxon test with a degree of 95% confidence (a = 0.05) so that if the value of p<0.05 means that there is an influence of independent variables with dependent variables.

RESULTS

Characteristics of respondents

Table 1 Characteristics of Respondents by Gender

Yes	Gender	Quantity	Percentage (%)
1	Male	11	61,1
2	Women	7	38,9
	Total	**18**	**100**

Source: Primary Data 2025

Based on table 1, the most respondents were dominated by men as many as 11 people (61.1%) while those who were female were 38.9%.

Characteristics of Respondents Based on Infant Age

Table 2 Characteristics of Respondents Based on Infant Age

Yes	Infant Age	Quantity	Percentage (%)
1	0 days	16	88,9
2	1 day	1	5,6
3	4 days	1	5,6
	Total	**18**	**100**

Source: Primary Data 2025

Based on table 2, the most respondents were 0 days old, namely 16 respondents (88.9%) and at least 1 day and 4 days old with 1 respondent (5.6%) each.

Univariate Analysis

Table 3 Baby's Sucking Ability *Pre-test*

Yes	The Ability to Suck BBLR Babies Before Oral Stimulation	Quantity	Percentage (%)
1	No suction reflex	18	100
2	There is a sucking reflex	0	0
	Total	**18**	**100**

Source: Primary Data 2025

Based on table 4.3 of respondents before the administration of oral stimulation, there was no suction reflex, which was a total of 18 respondents (100%).

The Ability to Suck BBLR Babies After Providing Oral Stimulation in the NICU Room of Toto Kabila Hospital

Table 4. Post-test Baby's Sucking Ability

Yes	Ability to Suck BBLR Babies After Oral Stimulation	Quantity	Percentage (%)
1	No suction reflex	4	22,2
2	There is a sucking reflex	14	77,8
	Total	**18**	**100**

Source: Primary Data 2025

Based on table 4. Respondents after giving oral stimulation had the most suction reflexes, namely 14 respondents (77.8%).

Bivariate Analysis

Table 5 Wilcoxon Statistical Test Analysis

Yes	BBLR Baby's Sucking Ability	N	Red	Std.Deviation	*p-value*
1	Before the administration of oral stimulation	18	8,78	0,732	0,000
2	After oral stimulation		11,72	0,575	

Source: Primary Data, 2025

Based on Table 5 , *the* mean (average) ability to suck the baby before being given oral stimulation is 8.78 with a standard deviation of 0.732 and after giving oral stimulation, which is 11.72 with a standard deviation of 0.575. Then, *a p-value* of 0.000 (≤ α 0.05) was obtained, meaning that there was an effect of oral stimulation on the ability to suck BBLR babies in the NICU Room of Toto Kabila Hospital.

DISCUSSION

Univariate Analysis

The Ability to Suck BBLR Babies Before Giving Oral Stimulation in the NICU Room of Toto Kabila Hospital

The results showed that BBLR babies before being given oral stimulation overall no suction reflex was found in 18 respondents (100%). This means that BBLR babies all have problems with the sucking reflex so they need intervention or treatment to improve the sucking reflex of BBLR babies.

BBLR babies who did not have a sucking reflex in 18 babies (100%) because based on the results of EFS (*Early Feeding Skill*) observation on the indicator of the baby's ability to survive breastfeeding, it was found that sometimes the muscle tone was dominant for breastfeeding, in the indicator of oral function ability these respondents always opened their mouths immediately when the lips were caressed while breastfeeding but the respondents sometimes when breastfeeding did not maintain smooth and rhythmic sucking This means that the baby does not breastfeed smoothly and is not rhythmic. In the swallowing ability indicator, the majority of respondents are sometimes unable to engage in long puffs of sucking. Meanwhile, in the indicator of the ability to maintain a stable physiological condition, the respondents always got that in the first 20 seconds after each breastfeeding the saturation and oxygen were stable and no behavioral stress appeared, and the sound of clean breathing was found no snoring sound. So it can be seen that there is no sucking reflex because this BBLR baby is unable to survive during breastfeeding, inability to function orally and unable to swallow.

The ability to suck in babies should begin to develop well at the age of 34-36 weeks so that in this baby born at 30-32 weeks gestational age, the sucking reflex is still not well developed, which is shown by a weak sucking reflex and also causes the inability to swallow food, one of which is caused by a weak sucking reflex. This can cause problems in the form of the risk of nutritional deficits due to inability to swallow (Amaliya et al., 2023).

Relevant to research Leony et al (2025) Regarding the implementation of oral stimulus in infants at Baladhika Husada Jember Hospital, it was obtained that babies with BBLR were found to have a sucking reflex that was not characterized by imperfect swallowing ability and weak swallowing muscles so that a diagnosis of nutritional deficit risk was established. Other research by Winda & Tirtawati (2024) which shows that the majority of babies' sucking abilities have difficulty swallowing and sucking.

Researchers assumed that all BBLR babies before being given oral stimulation did not show any suction reflex. This condition is caused by the immature ability of the baby's breastfeeding, which includes the inability to maintain effective and rhythmic suction, suboptimal oral oral function, and weak swallowing

ability. Although the physiological condition of the baby is relatively stable during breastfeeding, limitations in the sucking and swallowing aspects cause the baby to be unable to breastfeed adequately. This is related to the premature gestational age of the baby, where the sucking reflex should develop optimally.

The Ability to Suck BBLR Babies After Providing Oral Stimulation in the NICU Room of Toto Kabila Hospital

Based on the results of the study, it showed that the ability to suck BBLR babies after the administration of oral stimulation was mostly a sucking reflex with a total of 14 respondents (77.8%) and there were still 4 respondents (22.2%) who did not have a sucking reflex. It can be seen that after the administration of oral stimulation, most babies experience changes, namely the suction reflex so that this oral stimulation can improve the function of the BBLR baby's sucking reflex.

BBLR babies as many as 14 respondents (77.8) had a sucking reflex after being given oral stimulation because from the results of observation using EFS during breastfeeding babies, it was found that the indicator of the baby's ability to survive during breastfeeding all respondents had always dominant muscle tone (which indicates the presence of energy to breastfeed). In addition, the ability of oral oral function is that all respondents always open their mouths immediately when the lips are caressed while breastfeeding and the baby is not breastfeeding always maintains smooth and rhythmic sucking, compared to before being given oral stimulation, many who are unable to maintain smooth and rhythmic sucking while breastfeeding. Then, judging from the indicator of swallowing ability, the respondents were overall able to engage in long puffs of sucking, namely 7-10 puffs without signs of stress or cardiorespiratory behavior and response, compared to before. Finally, in the indicator of the ability to maintain a stable physiological condition, all of these respondents remained sedentary for the first 30 seconds after each breastfeeding saturation and oxygen was stable and there was no stress, and the sound of breathing was clean.

Oral stimulation is an action of increasing reflexes that affect the lactation process, including the searching reflex which causes the ability of oral function to increase, sucking and swallowing which causes the baby's ability to survive during breastfeeding and the ability to swallow also increases. The steps taken in the act of stimulating the breastfeeding reflex are by touching the muscle tissue around the baby's mouth which can improve blood circulation, improve muscle function and stimulate the sucking reflex in babies, especially BBLR and can improve the functions of other organs of the body (Suratmi et al., 2023). This condition occurs because oral stimulation can stimulate a better nervous system, improve the performance of the nervous system and there is coordination of sucking, swallowing and breathing mechanisms so that the baby's physiological abilities remain stable (Ghomi et al., 2019).

In line with the findings of the study Maghfuroh et al (2021) stated that oral stimulation can increase the sucking reflex of BBLR babies in the NICU Room of Mumhhamadiyah Lamongan Hospital because after being given oral stimulation, the baby's sucking reflex became strong with a percentage of 88.6% or as many as 31 BBLR babies. Supported by research findings Scarlet & Violet (2025) obtained all respondents EFS score (*Early Feeding Skill*) After oral stimulation is 12, which means that all respondents in this study have a suction reflex.

The results of this study also found that there were 4 respondents (22.2%) who, although they had been given oral stimulation, their ability to suck did not change. This is because from the results of observation using EFS during breastfeeding, these respondents experienced an increase but not significantly, where 1 respondent previously only occasionally opened his mouth when his lips were caressed while breastfeeding and when he was breastfeeding he could not maintain smooth and rhythmic suction. However, after being given oral stimulation, the baby opens his mouth immediately but still cannot maintain the sucking. There was 1 respondent who previously had the ability to survive during breastfeeding, his muscle tone was sometimes dominant, but after the intervention, this respondent was always able to maintain his dominant muscle tone during breastfeeding, but did not experience any change in swallowing ability, namely the respondent was still not able to engage in long bursts of sucking (7-10 puffs). This condition also occurred in 2 other respondents who did not experience an increase in swallowing ability. Thus, respondents basically experienced changes but not all indicators experienced changes, namely in swallowing ability and oral function.

Respondents who did not experience changes after the administration of oral stimulation to the 4 respondents, based on the characteristics of the respondents, their birth weight was 1500-1950 grams so that according to the researcher, the absence of any change in the ability to suck could be related to the birth weight of the BBLR baby.

The sucking reflex in babies increases naturally with growth and development. This reflex is an innate response that begins to form from the intrauterine period and generally achieves optimal development at about 36 weeks of gestation. At birth, the sucking reflex has developed well so that it plays an important role in the breastfeeding process and provides a sense of comfort for the baby. The existence of this reflex has a significant role in supporting the growth and development of the baby, with the level of strength, but this can be influenced by various factors including birth weight and the baby's health condition. In addition, one of the factors that affect the baby's sucking reflex is the ability to swallow (Hanum et al., 2022).

Research Maghfuroh et al (2021) It was also found that after the baby was given oral stimulation, there were 4 babies whose sucking reflex was still weak even though they had been given oral stimulation interventions. These results are also supported by research Yulendasari & Ayu (2016) which states that if the baby is born with a body weight of 1250-1500 or the mother's gestational age (gestational age) is less than 32 weeks, there is a tendency for the baby not to have a good sucking and swallowing reflex.

The researcher's assumption is that there are BBLR babies who do not experience an increase in their ability to suck after being given oral stimulation. Despite the changes, the improvement was not significant, especially in oral function and swallowing ability, such as the inability to maintain stable suction and perform long suction sequences. The four respondents had a birth weight of 1500–1950 grams, so this condition is suspected to be related to low birth weight babies (BBLR). The sucking reflex develops naturally as growth and is generally optimal at about 36 weeks of gestation, but its strength is affected by birth weight, health conditions, and swallowing ability.

Bivariate Analysis

The results of this study show that there is an effect of oral stimulation on the ability to suck BBLR babies in the NICU Room of Toto Kabila Hospital because the average EFS score to measure the baby's ability to suck before being given oral stimulation is 8.78 and the average EFS score after being given oral stimulation is 11.72, and the difference between before and after is 2.94 so that it can be seen that there is a significant difference between the ability to suck before and after oral stimulation.

The effect of oral stimulation on the baby's ability to suck because oral stimulation was carried out 2 times a day for 3 consecutive days for 5-10 minutes on each respondent by starting with washing his hands and using *a handcoon,* positioning the baby comfortably, placing a towel on the baby's chest, then performing the first oral stimulation on the perioral by stimulating the cheeks and lips 8x on each side, Perform intraoral stimulation, namely on the gums 4 times on each side, continue on the tongue by placing the pacifier on the tongue and pressing down 8 times, placing the pacifier in the middle of the ceiling to trigger the sucking reflex and letting the baby suck the pacifier for 2 minutes so that by doing this intervention 2 times a day for 3 consecutive days can stimulate the baby's ability to suck both from the ability to survive during breastfeeding, oral function ability due to intraoral stimulation, the ability to swallow and the ability to maintain a stable physiological condition.

The sucking reflex is closely related to the level of maturity of the nervous system, since this activity is triggered by the stimulation of the cranial nerves, namely the trigeminal, fasial, glosopharyngeal and vagus nerves. In babies born with low body weight, these nerves have not been optimally developed, so the resulting sucking reflex tends to be weak. With oral stimulation, the mechanism plays a role in increasing the sucking reflex by training the muscles of the mouth including the lips, tongue, and jaw through tactile stimulation and sensory massage. This process helps improve coordination of movements and activate the nerve pathways involved in the sucking and swallowing reflex, particularly in premature babies or babies with weak sucking reflexes. Thus, oral stimulation supports the success of oral nutrition. In addition, this stimulation forms muscle and nerve memory that gradually strengthens the ability to suck and swallow, so that the baby is able to learn to coordinate these muscles while drinking (Maghfuroh et al., 2021)

Research conducted by Insyirah et al (2025) mentioned that oral stimulation given to BBLR babies was effective against the suction reflex, compared to BBLR babies who were only given routine nurses with a p of 0.000. Strengthened by research findings Leony et al (2025) On the first day, the baby's sucking reflex is still weak, the rhythm is not regular, and the baby gets tired easily. However, on the third day there was an increase in suction strength, improved sucking-swallow coordination, and an increase in response to stimuli, so that the baby was able to breastfeed directly effectively and experience weight gain, which is an indicator of the success of the intervention.

The researcher assumes that the administration of oral stimulation has a significant effect on the improvement of sucking ability in babies BBLR given regularly twice a day for three consecutive days to be able to improve the baby's sucking ability, including endurance during breastfeeding, oral-motor function, swallowing ability, and stability of physiological conditions. This increase occurs because oral stimulation can train the oral muscles and activate cranial nerve pathways that play a role in the sucking and swallowing reflex, thereby supporting the success of oral nutrition in BBLR babies.

CONCLUSION

The ability to suck BBLR babies before being given oral stimulation in all respondents had no suction reflex as many as 18 respondents (100%) in the NICU Room of Toto Kabila Hospital. The ability to suck BBLR babies after being given oral stimulation was 14 respondents (77.8%) and no suction reflex as many as 4 respondents (22.2%) in the NICU Room of Toto Kabila Hospital. There was an effect of oral stimulation on the ability to suck BBLR babies in the NICU Room of Toto Kabila Hospital with *a p-value* of 0.000 (≤ α 0.05)

ADVICE

Hospitals can make this oral stimulation a standard of nursing care for BBLR baby patients who have problems in the suction reflex so that it can be applied in the process of treating BBLR patients.

It is hoped that health workers, especially nurses and midwives in perinatology or neonatal rooms, can apply oral stimulation as one of the nursing interventions to increase suction power in BBLR babies. Oral stimulation can be done regularly and according to standard operating procedures because it is simple, safe, and effective in supporting the fulfillment of the nutritional needs of babies.

The researcher is then expected to examine other factors that were not studied in the study, namely birth weight, gestational age and weight gain which can be influenced by the increase in the baby's ability to suck.

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