THE EFFECT OF BREASTFEEDING ON PAIN DURING HB-0 IMMUNIZATION

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ABSTRAK : PENGARUH MENYUSUI TERHADAP NYERI SAAT IMUNISASI HB-0

Latar Belakang: Tindakan menyuntikkan vaksin pada saat imunisasi dapat menyebabkan rasa nyeri pada bayi. Rasa nyeri yang dirasakan bayi jarang menjadi perhatian petugas kesehatan. Karena bayi belum mampu mengungkapkan rasa nyeri yang dirasakannya secara verbal. Metode yang bisa digunakan untuk mengurangi nyeri ialahmenyusu. Asupan manis pada ASI dapat mengurangi rasa sakit, seperti yang terdapat pada ASI. Tujuan: penelitian ini untuk mengidentifikasi pengaruh menyusu terhadap nyeri saat imunisasi Hb-0.

Metode: Jenis penelitian kuantitatif dengan quasi eksperimen *(Posttest Only Control Group Design)*. Populasi seluruh bayi baru lahir hingga usia 7 hari. Sampel yang digunakan 34 responden. Penelitian dilaksanakan di Wilayah Kerja Puskesmas Totomulyo Kabupaten Tulang Bawang Barat pada bulan Februari - Juni. Skala nyeri diukur dengan NIPS (Neonatal Infant Pain Scale). Analisis data secara univariat dan bivariat (uji-t).

Kesimpulan: Hasil penelitian menunjukkan nilai rata-rata *mean* pada kelompok intervensi adalah 2,53 masuk katagori nyeri ringan sedangkan pada kelompok kontrol skala rata-rata *mean* 5,65 masuk katagori nyeri hebat. Hasil uji-t didapat nilai (p value = 0,000 < 0,05) menunjukkan adanya pengaruh menyusu terhadap nyeri saat imunisasiDari analisis data diatas dapat disimpulkan bahwa terdapat pengaruh menyusu pada bayi terhadap skala nyeri saat imunisasi Hb-0. Dari hasil penelitian ini diharapkandapat dijadikan tindakan alternatif dalam mengatasi nyeri yang dialami para bayi pada saat imunisasi. Saran: Disarankan agar penyedia layanan kesehatan mengedukasi orang tua tentang pilihan menyusui selama imunisasi HB0 sebagai metode alternatif untuk mengurangi respons nyeri pada bayi.

Kata Kunci : Nyeri, Imunisasi HB-0, Menyusui, ASI, Bayi

ABSTRACT

Background: The act of administering vaccines during immunization can induce pain in infants. The pain experienced by infants often goes unnoticed by healthcare providers, as infants are unable to express their pain verbally. One method that can be used to alleviate this pain is breastfeeding. The sweet content in breast milk can help reduce the sensation ofpain. Objective: this research aims to identify the effect of breastfeeding on pain during Hb-0 immunization.

Method: this study employed a quantitative research approach with a quasi-experimental design (Posttest Only Control Group Design). The population comprised all newborns up to 7 days old, with a sample size of 34 respondents. The research was conducted in the Totomulyo Primary Health Care, West Tulang Bawang Regency, from February to June. Pain levels were measured using the Neonatal Infant Pain Scale (NIPS). Data analysis involved univariate and bivariate analysis (t-test).

Conclusion: the research results revealed that the mean value in the intervention group was 2.53, categorized as mild pain, whereas in the control group, the mean score was 5.65, categorized as intense pain. The t-test yielded a value (p value = 0.000 < 0.05), indicating the influence of breastfeeding on pain during immunization. Based on the above data analysis, it can be concluded that there is an effect of breastfeeding on infants in relation to the pain scale during Hb-0 immunization. This research is expected to provide an alternative measure to address the pain experienced by infants during immunization. Suggestion: It is recommended that healthcare providers educate parents about the option of breastfeeding during the HB0 immunization as an alternative method to alleviate pain responses in infants.

Keywords: Pain, Hb-0 Immunization, Breastfeeding, Infants

INTRODUCTION

Immunization is a preventive measure against

infectious diseases, especially those that can be prevented through vaccination. Immunity works by providing weakened or inactivated bacterial or viral antigens to stimulate the immune system (Blandina Tri Novita Laia, 2019). Hepatitis B vaccine should be administered immediately after birth, as it is an extremely effective preventive measure that can break the transmission chain from mother to newborn. Therefore, all infants are required to receive the first dose of the hepatitis B vaccine shortly after birth and before being discharged. Infants born to mothers with unknown HBsAg status must receive the first dose of the hepatitis B vaccine within 12 hours of birth (Leni et al., 2021).

Based on the 2018-2019 Hepatitis and Digestive Tract Infection Information System (SIHEPI), a total of 1,643,204 pregnant women were tested for hepatitis B across 34 provinces. The results indicated that 30,965 pregnant women were reactive (infected with hepatitis B virus), and 15,747 newborns from reactive mothers were given Hepatitis B Immunoglobulin (HBIg). HBIg administration is aimed at enhancing protection for infants to prevent hepatitis B transmission from their mothers. Up until June 2019, a total of 490,588 pregnant women were tested, with 9,509 being HBsAg reactive. From these tests, it was found that 4,559 babies had received HBIg within 24 hours along with routine immunization, protecting them from maternal hepatitis B transmission. Prevention of hepatitis B transmission from mother to infant is achieved through Hb-0 vaccination within 24 hours of birth. In the case of infants born to hepatitis B-infected mothers, Hepatitis B Immunoglobulin (HBIg) is administered within 24 hours (Ministry of Health of the Republic of Indonesia, 2019).

An estimated 1.7 million deaths in children, or 5% of under-five deaths in Indonesia, result from Vaccine Preventable Disease-3 Impact (PD3I). To achieve national and global targets in eradicating, eliminating, and reducing PD3I, immunization coverage must be maintained as high and uniform as possible to attain a high level of Population Immunity. Failure to maintain high and uniform immunization coverage can lead to PD3I outbreaks. In Tulang Bawang Regency, the coverage rate for HB0 immunization is 77.9% (Tulang Bawang Health Profile, 2020).

Injecting vaccines during immunization can cause pain in infants (Rahayuningsih, 2012). The pain experienced by infants often goes unnoticed by healthcare providers due to infants' inability to express their pain verbally. Infants express pain differently, one of which is through behavioral pain responses. Behavioral pain responses in infants include localized reflexes from the stimulated area, loud crying, facial expressions of pain and/or anger, and physical resistance after receiving a stimulus (Wong, 2004; Waryantini, 2018).

Infant pain experiences can affect heart rate, respiration rate, blood pressure, and tissue oxygenation, potentially causing these parameters to decrease or increase (Faye et al., 2010 as cited in Harianti, 2017). Long-term effects of pain in infants include increased somatic complaints without clear causes, heightened physiological and behavioral responses to pain, psychosocial issues, and aversion to human contact (Wong et al., 2009; Alfina, 2021).

Assessing pain in infants presents its own challenges. Therefore, communication with infants must consider nonverbal indications. Infant pain is subjective, individual, complex, and universal. Evaluating the perceived pain of infants can be done by examining physiological parameters, behavioral methods, and stress hormones. Pain reactions in infants include crying, grimacing, furrowing the brow, restlessness, and agitation. Facial expressions are signals that can assess pain (James, Nelson & Ashwill, 2013; Harianti, 2017).

The impact of vaccination itself can lead to infants becoming fussy and crying continuously due to injection site pain accompanied by fever symptoms. One effort to reduce this pain's impact is to minimize the pain during immunization. Several studies have been conducted on techniques to reduce the pain experienced by infants during immunization. Meta-analysis studies have suggested various non-pharmacological pain management interventions in nursing practice, including non-nutritive sucking, music therapy, swaddling, auditory and multisensory stimulation, kangaroo care, maternal touch, and breastfeeding (Kashaninia et al., 2008; Alfina, 2021).

According to theory, the intake of sugar or sweet solutions can alleviate pain, similar to the sweetness present in breast milk. This is because of the release of Beta-endorphin (endogenous opiate hormone produced by the body, similar to morphine) and the preabsorption mechanism of sweetness. Beta-endorphin is produced by the fetus at birth from the hypothalamic pituitary gland, binding to receptors in the brain, and regulating pain perception. When a mother provides breast milk to her child, it fosters a psychological bond between the mother and the baby. This process is called "attachment." Consequently, the baby cries and fusses less (Anggraini J, 2015). The provision of breast milk shows a difference in the average pain response in infants given breast milk (intervention) compared to infants given touch therapy (control) during

immunization injections, with a P value of 0.000 (Atikah, A., Heryati, K., & Eliana, E., 2018).

RESEARCH METHODS

The research employed a quasi-experimental design with a Posttest Only Control Group design approach. The study was conducted from February to June 2023 in the Totomulyo Primary Health Care, West Tulang Bawang Regency. The population of the study included all newborn infants who received Hb0 immunization, totaling 42 individuals. The sample for this study consisted of 34 infants divided into an experimental group and a control group. Within the experimental group, 17 infants were given breastfeeding during the administration of the Hb0 immunization, while 17 infants in the control group were given a placebo during the immunization injection. The sampling technique used was purposive sampling based on inclusion criteria. The variables measured in this study were pain during Hb0 immunization and breastfeeding administration. Pain levels in the sample were measured using the Neonatal Infant Pain Scale (NIPS). Data analysis was performed using the t-test.

RESULTS AND DISCUSSION

Respondent Characteristics

Table 1
Respondent Characteristics based on Infant Gender and Infant Weight

Intervention Group			Control Group		
Gender	**Frequency (F) n=17**	**Percentage (%)**	**Gender**	**Frequency (F) n=17**	**Percentage (%)**
Male	8	47,1	Male	6	35,3
Female	9	52,9	Female	11	64,7
Weight			**Weight**		
2600	1	5.9	2600	2	11.8
2700	3	17.6	2700	4	23.5
2800	3	17.6	2800	1	5.9
2900	3	17.6	2900	2	11.8
3000	2	11.8	3000	3	17.6
3100	2	11.8	3100	3	17.6
3300	1	5.9	3200	2	11.8
3400	2	11.8			

RESEARCH RESULTS

Table 2
Effectiveness of Infant Feeding on Pain during Hb-0 Immunization in Intervention Group and Control Group

Variable	N	Mean	SD	Min-Max	*Sig, 2-Tailed*
Intervention	17	2,53	1.007	1– 4	
			0,996	4– 7	0,000
Control	17	5,65			

Score: *0 –2*:Minor Pain/No Pain
3–4:Mild Pain–Moderate pain
>4: Severe Pain

Based on Table 2, it is known that the average pain score or mean pain scale in infants during Hb-0 immunization in the intervention group is 2.53, which falls within the category of mild pain scale. On the other hand, the mean pain scale value in infants during Hb-0 immunization in the control group is 5.65, which falls into the category of severe pain scale. There is a significant difference between the average pain response scale of infants in the breastfeeding intervention group and the control group without intervention, with a P value of 0.000 (P value <0.05).

 DOI 10.33024, http://ejurnalmalahayati.ac.id/index.php/kebidanan

DISCUSSION

There are numerous methods to reduce pain resulting from immunization through injections, both pharmacological and non-pharmacological. Various non-pharmacological methods can be employed, such as physical exercise, vibrational massage, breastfeeding, cold and warm compresses, skin stimulation, acupuncture, and including psychological care approaches. One of the non-pharmacological pain management strategies, which offers many benefits, is through breastfeeding.

The theory about pain explains that when a nurse administers an injection, it stimulates small nerve fibers (pain receptors), causing inhibitory neurons to become inactive and the gate to open. At the same time, the baby is provided with containment therapy, which has a calming effect and stimulates large nerve fibers, activating inhibitory neurons and projection neurons. Inhibitory neurons prevent projection neurons from sending signals to the brain, thus closing the gate and preventing the pain stimuli from reaching the brain (Suzanne, 2010; Wahyuni, 2020).

Breastfeeding is considered the safest and most effective method for pain relief compared to other non-pharmacological methods, such as topical anesthesia, sweet solutions (sucrose administration), non-nutritive sucking, expressed breast milk, and music therapy. Pain reduction methods used during painful procedures, including the use of oral sucrose and pacifiers, are less effective because they can disrupt proper breastfeeding initiation. The experiences of pain that infants go through in the early stages of their lives can lead to risks such as restlessness, heightened sensitivity, sleep disturbances, fear of pain, and increased oxygen consumption. Additionally, there is a possibility of long-term risks or impacts, including pain memory, developmental delays, and alterations in pain responses (Putri et al., 2022).

According to The Children's Mercy Hospital, containment therapy is closely related to providing a comfortable position for the baby. This positioning technique can help minimize distress in infants during various invasive procedures, including immunization (Wahyuni, 2020).

Breastfeeding by holding and embracing the baby satisfies the child's psychological needs, as the baby feels peaceful, comfortable, and warm in its mother's embrace. This aligns with the oral developmental phase of the baby, where pleasure is centered around the mouth. During breastfeeding, the baby focuses on the sucking activity, which can help diminish the perceived pain and provide comfort. Sucking activity reduces distress behavior when the baby is uncomfortable in its surrounding environment, as it acts as a diversion and calming mechanism (Devi, 2021).

The results of this study are in line with previous research titled "The Effect of Breastfeeding on Infant Pain Response During Pentavalent Immunization," which states that breastfeeding is effective in reducing pain responses during immunization. Sweet substances, such as the sweetness found in breast milk, can reduce pain (Atikah, 2018).

Direct breastfeeding in the correct and comfortable position stimulates the release of endorphins, which inhibit pain impulses to the brain. Additionally, the sweetness in lactose in breast milk can induce the endogenous opioid analgesic pathway, preventing pain transmission to the brain and thereby reducing the perception and sensation of pain during immunization injections (Waryantini & Seli, Ariyanti, 2018).

The intake of sugar or sweet solutions can also alleviate pain, similar to the sweetness present in breast milk. This is because the release of Beta-endorphin (a self-produced endogenous opiate hormone) and the preabsorption mechanism of sweetness occur. Beta-endorphin is produced by the fetus at birth in the pituitary hypothalamus gland and binds to receptors in the brain, regulating pain perception. Breastfeeding establishes a psychological bond between the mother and the baby, reducing crying and fussiness in the baby (Atikah, 2018).

Other research also demonstrates that containment therapy is more effective in reducing pain scores in infants during measles vaccination compared to music therapy. Similar findings are reported by researcher Devi (2018) who found a positive impact of breastfeeding techniques on pain responses in infants during immunization. Breastfeeding before, during, and after painful immunization can be prevented and alleviated through nursing actions to avoid distress behavior (Wahyuni & Suryani, 2021).

Research by Putri et al. (2022) also shows differences in pain levels measured using the DAN scale between neonates given breastfeeding intervention during immunization. These earlier studies undoubtedly strengthen the findings of the current study. Nursing has an impact on pain responses in infants due to the sweetness that triggers the release of endogenous opioids, which play a role in inhibiting and closing the pain gate, resulting in decreased pain sensation. Lactose present in breast milk can trigger the activation of the endogenous opioid analgesic pathway, causing pain

impulses not to be sent to the brain, thus preventing pain perception during injections (Putri et al., 2022).

Pain responses in infants can decrease due to direct breastfeeding by the mother during the immunization process. The act of breastfeeding, with the mother holding and embracing the baby in a comfortable position, makes the baby feel comfortable, safe, protected, and warm. Thus, breastfeeding can calm the baby and reduce the likelihood of crying.

CONCLUSION

Breastfeeding during the administration of HB0 immunization is effective in reducing the pain associated with immunization in infants.

SUGGESTION

It is recommended that healthcare providers educate parents about the option of breastfeeding during the HB0 immunization as an alternative method to alleviate pain responses in infants.

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