

The Effectiveness of the sensorial saturation method on the pain response of infants in Infusion

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Abstract— This study examines the sensorial saturation effect and non-nutritive suckington reducing neonates' pain when undergoing the invasive procedure (infusion) at Rumah Sakit Palang Merah Indonesia (Indonesian Red Cross Hospital) in Bogor. Quasi-experimental research design with a sample of 15 respondents. The study showed that the heart rate of the two groups significantly increases after comparison. The change of the SaO₂ level in the SS Group was lower than the control (NNS). The change of the CRIES score in the SS group was lower than NNS. However, there were statically significant differences between SS and NNS groups ($p=0.00$). It's suggested that single or combined use SS is effective in reducing pain responses in neonates.

Keywords: neonate, non-nutritive sucking, sensorial saturation, pain.

INTRODUCTION

The high morbidity and mortality rates for infants is a significant phenomenon. It is estimated that 2/3 of deaths under one year of age occur in the first 28 days. In 2009 there were 2.6 million babies born who died worldwide, and there were 7200 babies every day. 98% of them occur in low and middle-income countries, while 1 in 320 occurs in high-income countries. In 2010 there were 3.1 million babies who died, of which a quarter to half occurred in the first 24 hours of birth, and the cause was premature and small births, infections, and shortness of breath. [1]

The Perinatology Care Unit is a unit that specializes in the care of sick or premature newborns. [2] A series of actions such as blood sampling, infusion, heel insertion, intramuscular injection, and catheter insertion will cause stress, disrupting building trust, and decreasing the sense of control and pain. Trust is formed when babies receive consistent, loving care from those who nurture or care for them. Babies always try to control their environment through emotional expressions such as crying or smiling. When babies are treated in hospital, such signs are often misinterpreted so that the treatment provided is routine without paying attention to individual needs. Although babies do not have an adequate cortical function to interpret or remember pain experiences, they can recognize and respond to pain stimuli since birth. [3]

Pain assessment is an important component of the nursing process, but health professionals, including nurses, often underestimate and manage pain still sporadically. Babies are considered not to feel pain but, in fact, show behavior, especially on the face and physiology, including hormonal as an indicator. [4]

The effects of pain on babies can be short and long term. The breakdown of fat and carbohydrate reserves and increased morbidity are short-term effects. Simultaneously, the long-term impacts include refusal to contact humans, developmental intercourse, neurobehavioral disorders, learning disorders, poor motor performance, attention deficits, poor adaptive behavior, inability to face new situations, and increasing hormonal stress adult life. (Wong, 2008). [5] In overcoming this impact, it is necessary to treat it where pain treatment's overall goal is to reduce as much as possible with the least possible side effects. There are two methods for treating pain, namely pharmacological and non-pharmacological. [4]

Non-pharmacological measures used to reduce pain in the baby's room include the provision of non-nutritive sucking, which is to apply a silicone teat to the baby's mouth to stimulate suction without giving breast milk or formula milk. For babies, the mouth is the primary instrument for receiving stimulation and enjoyment, so interventions in minimizing pain must be carried out according to the needs that are useful in strengthening optimal physical, psychosocial, and neurological development.

Research conducted by Devi in 2012, which examined the effect of giving non-nutritive sucking combined with giving a sucrose solution on the pain response of infants who were infused, found that the average pain response in the control group was higher than the intervention group (15.50 > 7.89). It shows a significant difference after performed infusion between the intervention group and the control group. [6]

The results of another study by Liaw et al. (2010) related to the provision of non-nutritive sucking combined with the provision of sucrose solution to the pain response of infants by intramuscular injection showed that babies who were given non-nutritive sucking 1 minute before intramuscular injection significantly decreased pain response ($B = -11.27$, $P < 0.001$) and giving sucrose 2 minutes before the intramuscular injection reduced pain ($B = -11.75$, $P < 0.001$). [7]

METHOD

This study's design is an analytical study with a quasi-experimental design, namely research that tests an intervention on a group of subjects with or without comparisons but does not do randomization to enter the subject into the treatment or control group. The research design used a posttest, only a non-equivalent control group, wherein this design; the respondents were divided into two or more groups. One group is the treatment group, while the other group is the control group. This research was conducted in the nursery room at PMI Bogor Hospital.

The instrument used in this study was a pain assessment form using the standard CRIES scale; the elements assessed were crying response, needing oxygen, increasing vital signs, expression, and not sleeping. The score ranges from 0 to 2; after adding, the lowest score is 0, the highest score is 10. The pain assessment instrument is combined with a form containing the characteristics of the respondent. Samples were selected based on inclusion criteria.

Data collection was carried out, including measuring vital signs, giving silicon teats, infusion, and assessing the baby's response with the CRIES scale form.

RESULT

Respondent Characteristics

Table 1.
Respondents Gender Distribution
(N=15)

Gender	Total	Persentase
Male	15	50
Female	15	50

Table 2.
Characteristics of respondents' age (days) and gestational age (weeks)
(N=30)

Var	Mean	St.Dev	95% CI
Baby's age	3.73	0.382	2.31 – 5.16
Gestational age	3.58	0.33	34.6-37.1

Table 3.
Characteristics of infant's suction reflex & Characteristics of previous pain experiences

Var	f	Percentage (%)
Suction Reflex		
Yes	6	20
No	24	80
Total	30	100
Previous pain experiences		
Yes	27	90
No	3	10
Total	30	100

Table 4.
Comparison of the average infant pain response to NNS and SS administration(n=30)

Method	Mean	SD	SE	p-value	n
Non-nutritiv sucking	5.27	0.41	0.158	0.000	15
Sensorial saturation	2.53	0.74	0.192		15

In Table 4, it can be seen that the average pain response of infants in the non-nutritive sucking treatment group was 5.27, with a standard deviation of 0.408, while for the pain response of infants in the sensorial saturation group, the average was 2.53 with a standard deviation of 0.743. The statistical test results showed that the value of $p = 0.000$ means that at 5% alpha, there is a significant difference where the sensorial saturation method of the baby's pain response is significantly reduced.

DISCUSSION

Based on the hypothesis testing results, it turns out that there is a significant difference between giving the non-nutritive sucking method to the giving of the sensorial saturation method to the respondents. The non-nutritive sucking method is commonly used to relieve pain in infants. It is an invasive method of

sucking on the baby to strengthen sensory stimuli to help achieve self-regulation. The sensorial saturation method applies multisensory stimulation through tactile stimulation, taste, hear, and see, increasing the pain threshold and decreasing the body's response to pain.

The difference in pain response and pain scale of the neonates in the treatment group and the control group was not only in the neonate's gestational age and age but also by how the nurse performed stuing at the infusion time insertions performed. [8]

CONCLUSION

The results of this study indicate that there is a significant difference between the application of the non-nutritive sucking method and the sensorial saturation method in reducing pain response in infants who are subjected to infusion. Giving Sensorial Saturation is recommended as a nursing therapy for infants who are receiving invasive measures.

This research is expected to continuously improve the understanding of the skills and art of caring for babies in providing nursing care. It is preferable to use various methods and approaches to pain relief measures to find a method that feels appropriate to the situation and conditions.

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