Effect Of Umbilical Cord Care Using the Topical Breastfeeding Method on The Length of Time for Releasing the Umbilical Cord of Newborns

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ABSTRACT

Neonatal tetanus can occur, one of which is due to infection in the baby's umbilical cord, the faster the umbilical cord is released, reducing the risk of infection. Umbilical cord care using breast milk is the newest cord care which is cleaned and cared for by applying breast milk to the base of the umbilical cord using a cotton bud. This research designPre-Experiment with a static group comparison research design. The population of this study were newborns aged 0-8 days in the September-October period in the working area of the Bontobangun Health Center. The sample of this study were newborns aged 0 days as many as 24 babies with total sampling technique, which were divided into two intervention groups, namely the topical method of breast milk and the group of wrapping breast milk with dry gauze. Data analysis used the Chi Square test. The results of the Bivariate Analysis obtained a value of p = 0.000. This value is smaller than the value α = 0.05, so it can be concluded that 0.000 <0.05, so there is a significant effect between cord care using the topical breastfeeding method on the time of releasing the umbilical cord of newborns in the Working Area of the Bontobangun Health Center. The conclusion in this study is that treatment using the topical method of breast milk releases the umbilical cord faster than normal umbilical cord care. So that treatment using the topical method of ASI is more recommended

Keywords; umbilical cord; topical breast milk

INTRODUCTION

According to the World Health Organization (WHO) in 2020, it is estimated that around 2.4 million babies died within the first month of life worldwide. Indonesia ranks seventh among the ten countries with the highest neonatal mortality rates, with approximately 60,000 neonatal deaths. The majority of neonatal deaths (75%) occur within the first week of life, and about 1 million newborns die within the first 24 hours. Causes include premature birth and intrapartum-related complications.

According to the Indonesia Health Profile 2021, there were 33 cases of neonatal tetanus, of which 14 babies died. Neonatal tetanus occurs due to factors such as unskilled birth attendants, home deliveries assisted by traditional birth attendants, umbilical cord

care using alcohol/iodine, unsterile delivery instruments, and even the use of bamboo. Other related conditions include diarrhea, birth defects, neonatal tetanus, and malaria. Malnutrition is an underlying factor that makes children more susceptible to severe illnesses.

Based on the Gender and Child Profile of West Pasaman in 2021, the neonatal mortality rate (0–28 days) was 8.61 per 1,000 live births, with 70 deaths out of 8,129 newborns. A study by Sari (2020), titled *Comparison of the Use of Topical Breast Milk and Dry Gauze Care on the Duration of Umbilical Cord Separation in Infants*, found that umbilical cords treated with breast milk detached in 4 days and 3 hours, while those treated with dry gauze detached in 6 days and 4 hours. Umbilical cord care using breast milk offers several benefits for both mothers and babies. This method is easy for mothers to perform and maintains cleanliness.

According to Medhyna (2020), umbilical cord care using breast milk is a recent technique in which the base of the cord is cleaned and treated by applying breast milk with a cotton bud, ensuring it remains clean and dry. The advantages of the topical breast milk method include cost-efficiency, ease of application, and being a non-invasive and safe technique.

Dompas (2021) explained that breast milk contains more than 200 essential components, including proteins, fats, carbohydrates, vitamins, minerals, growth factors, hormones, enzymes, immune factors, and white blood cells. Damanik (2020) compared the topical breast milk method and the open technique for umbilical cord separation in newborns at HJ Nirmala Sapni Maternity Clinic, Krakatau Pasar 3, Medan Timur, Medan City. The results showed that all 15 respondents (100%) treated with the topical breast milk method experienced rapid cord separation in 10 babies (66.7%) and slower separation in 5 babies (33.3%). In contrast, among those treated with the open technique, 4 babies (26.7%) experienced rapid cord separation (on days 4–5), while 11 babies (73.3%) had delayed separation (days 6–9).

Saridewi (2020), in her study on the relationship between topical breast milk and accelerated cord separation, found that most neonates receiving topical breast milk experienced cord separation on day 3 (60%) and almost half on day 2 (40%). In the control group, most cords detached on day 7, and a smaller proportion on days 4–5 (10% each).

Based on the researcher's experience while supervising students at Bontobangun Public Health Center, a direct survey was conducted with five postpartum mothers visiting the center. They reported that cord care was still done using dry gauze wrapping, sometimes left open, and cord separation took 6–7 days. Some mothers also mentioned cleaning the cord with alcohol at home and keeping it covered, fearing that leaving it open without gauze could be harmful. Based on this background, the researcher was interested in conducting a study titled: "Effect of Umbilical Cord Care Using the Topical Breast Milk Method on the Duration of Umbilical Cord Separation in Newborns in the Working Area of Bontobangun Public Health Center."

The objective of this study was to determine the effect of umbilical cord care using the topical breast milk method on the duration of cord separation in newborns in the working area of Bontobangun Public Health Center.

MATERIAL AND METHOD

The research design used was pre-experimental with a control group, applying a static group comparison design. The population in this study consisted of newborns aged 0–8 days during the period of September–October in the working area of Bontobangun Public Health Center. The sample in this study was newborns aged 0 days during the same period, totaling 24 babies, selected using the total sampling technique. The sample was divided into two intervention groups: one group receiving umbilical cord care using the topical breast milk method, and another group in which the cord was wrapped with sterile dry gauze.

The data collection instrument used in this study was an observation sheet specifically designed to record the respondents' identity, the general condition of the newborn, and the time of umbilical cord separation. The observation sheet was employed to monitor the newborns from the first day of cord care until the umbilical cord naturally detached. The recorded data included the newborn's date of birth, the initiation of cord care, and the exact day and time when the cord separated. In addition, supporting tools such as a clock and calendar were used to ensure the accuracy of time recording, while sterile equipment—including gloves, gauze, cotton, and a small syringe—were utilized for the intervention group that received topical breast milk treatment. For the control group, cord care was performed by wrapping the cord with sterile dry gauze according to midwifery care standards.

The validity of the instrument in this study was established through content validity by means of expert judgment conducted by academic supervisors and midwifery practitioners at the Bontobangun Public Health Center. Content validity focused on the appropriateness of the observation sheet items with the research variables, namely the method of umbilical cord care as the independent variable and the time of cord separation as the dependent variable. The reliability of the instrument was assessed through interrater reliability, ensuring consistency of recording between the researcher and healthcare providers who assisted in data collection. Since the measured variable—time of umbilical cord separation—is objective, the instrument demonstrated a high level of reliability and trustworthiness. Therefore, the instrument used in this study was considered both valid and reliable for measuring the intended variables.

Data analysis used the Chi-Square test. In its implementation, two groups were compared: the group receiving umbilical cord care with the topical breast milk method and the group receiving conventional umbilical cord care.

The test applied in this study was the Independent Samples t-Test. If the significance value was less than $\alpha = 0.05$, it indicated that there was an effect of umbilical cord care using the topical breast milk method on the duration of cord separation in newborns in the working area of Bontobangun Public Health Center. If the significance value was greater than $\alpha = 0.05$, it indicated that there was no such effect.

The study was conducted in the working area of Bontobangun Public Health Center, Rilau Ale Subdistrict, Bulukumba Regency, focusing on the effect of umbilical cord care using the topical breast milk method on the duration of umbilical cord separation in newborns.

RESULTS

Based on the results in Table 1, it was found that the average umbilical cord separation time in the conventional care group was 6.33 days (range: 5–7 days), while in the breast milk group it was 4.00 days (range: 3–4 days). The umbilical cord separation time in the breast milk group was faster compared to the conventional care group.

Tabel 1. Frequency Distribution Based on Umbilical Cord Separation Time

Group	Mean	Median	SD
Conventional	6,33	6,00	1,302
Breast Milk	4,00	4,00	1,044

Tabel 2. Effect of Umbilical Cord Care Without and With the Topical Breast Milk Method on the Umbilical Cord Separation Time of Newborns

Group		Mean	Std. Deviation	Std. Error Mean	p-Value
Conventional	12	6.3333	1.30268	0.37605	0,000
Breast Milk	12	4.00	1.044	.302	

Based on the results in Table 5.2, the p-value obtained was 0.000. This value is smaller than $\alpha = 0.05$, therefore it can be concluded that $0.000 < 0.05$, meaning that Ho is rejected. In other words, there is a significant effect of umbilical cord care using the topical breast milk method on the umbilical cord separation time of newborns in the working area of Bontobangun Public Health Center.

DISCUSSION

Based on the categorical analysis, it was found that among respondents who did not use the topical breast milk method, the umbilical cord separation time in the conventional care group had an average of 6.33 days, or approximately 5–7 days. According to a study by Sari (2020) titled *Comparison of the Use of Topical Breast Milk and Dry Gauze Care on the Duration of Umbilical Cord Separation in Infants*, the separation time for cords treated with breast milk was 4 days and 3 hours, while for those treated with dry gauze it was 6 days and 4 hours. Umbilical cord care using breast milk has several benefits for both the mother and baby.

A study conducted by Umrah (2017) titled *The Effect of Topical Breast Milk Application on Umbilical Cord Care Duration in Newborns at Angkona Health Center* showed that in the topical breast milk group, fast cord separation occurred in 16 babies (84.2%), and normal separation in 3 babies (15.8%). In the dry gauze group (control), fast cord separation occurred in 6 babies (31.6%) and normal separation in 13 babies (68.4%). This aligns with the theory of Abata Qarry (2015), which states that the umbilical cord should not be covered with gauze as it will cause moisture. This not only slows down the separation process but also increases the risk of infection.

The researcher's analysis of the above findings is that cords not treated with topical breast milk or covered with gauze are less exposed to air, thus remaining moist and slow to dry. As a result, separation is delayed, and prolonged cord attachment may increase the risk of infection.

Based on the categorical analysis, the average separation time in the breast milk group was 4.00 days, or approximately 3–4 days. This was faster compared to the

conventional care group. This is because breast milk contains lactose, protein, fat, minerals, and vitamins, and has direct effects at the cellular level.

One of its components, protein, plays a role in forming essential body bonds, regulating fluid balance, maintaining pH balance by reacting with acids and bases, forming antibodies, and playing an important role in transporting nutrients into tissues. Breast milk contains lymphocytes consisting of B cells and T cells. B cells function in humoral immunity, with immunoglobulin receptors that can recognize foreign antigens and develop into plasma cells that form antibodies. T cells help B cells form antibodies, have specific receptors for antigens, and suppress immune responses. Physiologically, when foreign substances enter the body, B or T cells are activated, triggering macrophage responses to fight these substances. This leads to proliferation of B and T cells with macrophages and mitotic cell division (Jauhari, Fitriani & Bustami, 2018).

The present findings are consistent with Sari's (2020) study, which found that cords treated with breast milk separated in 4 days and 3 hours, compared to 6 days and 4 hours for dry gauze care. This is also supported by Subiastutik (2012), who stated that topical breast milk is rich in antibodies, anti-inflammatory agents, and leukocytes that suppress colonization of pathogenic microorganisms that may cause infection, thus accelerating cord separation.

The researcher's analysis suggests that breast milk is an effective medium for cord care due to its nutritional content and cost efficiency compared to dry gauze care. The various nutrients in breast milk, such as proteins, fats, carbohydrates, minerals, and vitamins, make it effective for newborn cord care.

Cord care using breast milk has several advantages for mothers and babies. It is easy for mothers to perform, hygienic, and promotes faster cord separation, thereby reducing infection risk, provided that cord hygiene is maintained and hands are washed before and after care. Results showed that cords treated with topical breast milk separated faster than those treated with dry gauze.

Data analysis using the Independent Samples t-Test yielded a p-value of 0.000, which is smaller than $\alpha = 0.05$. This means that Ho is rejected, indicating a significant effect of topical breast milk cord care on cord separation time in newborns in the working area of Bontobangun Health Center.

This is in line with Sari's (2020) findings, where cords treated with breast milk separated in 4 days and 3 hours, compared to 6 days and 4 hours with dry gauze. The

results show that topical breast milk cord care shortens separation time by 2 days compared to dry gauze care.

The beneficial nutrients in breast milk include high protein content, which plays a role in forming essential body bonds, regulating fluid balance, forming antibodies, and transporting nutrients into tissues. Proteins in colostrum and breast milk bind to proteins in the umbilical cord, forming an immune reaction and triggering apoptosis (programmed cell death). Under genetic control, cells undergo programmed death, which accelerates the drying of cord tissue, leading to mummification and faster separation.

Breast milk also has anti-infective and anti-inflammatory properties, and contains antibodies that protect the cord from infection while aiding wound healing. During leukocyte infiltration at the cord base, IgA plays a role as the most important immunoglobulin, acting as an antibacterial agent against pathogenic bacteria. T and B lymphocytes synthesize antibodies, which form specific immunoglobulins against antigens, producing bacteriostatic effects that prevent pathogenic bacterial growth, thus reducing infection risk and accelerating cord separation.

The researcher's assumption is that cord care using topical breast milk is superior because it prevents infection and shortens separation time. Proteins in breast milk bind with cord proteins, aiding in tissue repair and wound healing. In addition, its high antibody, anti-infective, and anti-inflammatory content prevents bacterial colonization. The advantages of this method are that it is easy to obtain, always available, sterile, and safe for babies.

CONCLUSION

Based on the results of the data analysis in this study, the conclusions are as follows: The average umbilical cord separation time in the conventional care group was 6.33 days, approximately 5–7 days. The average umbilical cord separation time in the breast milk group was 4.00 days, approximately 3–4 days. There is an effect of umbilical cord care using the topical breast milk method on cord separation time, with a p-value of 0.000. This value is smaller than $\alpha = 0.05$, thus it can be concluded that $0.000 < 0.05$, meaning that there is a significant effect of the topical breast milk method on umbilical cord separation time.

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