Perianal Care Proven to Reduce the Incidence of Diaper Dermatitis

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Maintaining a clean perianal area is an attempt to prevent and treat diaper dermatitis. The purpose of cleaning the perianal area is to prevent irritation. The practice of cleaning the perianal area is done by considering the physiology of the skin such as, normal flora, bacteria, and skin pH. Cleaning the perianal area can use water and a soft cloth without rubbing the skin hard. The purpose of applying evidence based in nursing practice is to identify the effect of perianal care by using water against diaper dermatitis with skin integrity issues. Search evidence of nursing practice used the PICO analysis. Thirty-four toddlers were divided into two groups: the intervention group (n = 17) and the control group (n = 17). The analysis used was Wilcoxon, and Mann-Whitney test. There was no significant difference in diaper dermatitis score in the intervention group and control group ($\rho > 0.05$). Cleaning the perianal area using water and tissues can be used to prevent and treat diaper dermatitis.

Keyword: *diaper dermatitis, skin integrity, perianal care*

Introduction

Diaper Dermatitis (diaper rash, napkin dermatitis, nappy rash) is an acute inflammatory disorder of the skin of baby - that is common in babies and children/ toddlers of 1 - 3 years old.[1] Diaper dermatitis is a non-immunological response to skin irritants that cause skin cell hydration disorders.[2] Diaper dermatitis can occur in patients who use diapers and patients who experience incontinence. The highest incidence of diaper dermatitis occurs at the age of 9 to 12 months.[1,3] Diaper dermatitis is common in children, but this condition can cause pain in children and cause problems for their parents or caregivers - some of which are itching sensation, discomfort, and pain that causes the child to be restless and fussy. Diaper dermatitis is easy to treat with good skin care, but if diaper dermatitis is not treated, it can result in worse conditions such as pain, bacterial and fungal infections, and erosive Jacquet's dermatitis.[4]

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Maintaining the cleanliness of the perianal area is an effort to prevent and reduce the worse condition when diaper dermatitis occurs. The purpose of cleaning the perianal area is to clean it without irritating it. The practice of cleaning the perianal area must be done by considering the function and physiology of the skin, such as normal flora in the area, irritation and bacteria caused by urine and feces, skin pH, the composition of the use of cleansers, and skin barriers to help maintain skin integrity.[5]

Preventing and overcoming diaper dermatitis can be done with an "ABCDE" approach which includes: Air, Barrier, Cleanser, Diapers, and Education. Air, in this context, is maximizing diaper free time. Barrier means providing protection by using a protective skin cream for each diaper change. Cleanser is an attempt to clean the diaper area gently using water and a soft cloth without rubbing the skin hard. Diapers, in this context, are the recommendation to use/choose diapers that absorb water and to avoid using diapers made of cloth. Change the diaper as soon as the diaper is dirty, at least every 1 to 3 hours during the day and once at night. Education, here, means teaching parents on how to keep the diaper area

clean.[6]

The prevention and treatment management are very important for patients. Cleaning the perianal area with water is an independent action that nurses can do - by involving parents - to prevent and reduce the incidence of diaper dermatitis. The use of water to clean the perianal area is an effective intervention that does not require large costs and does not cause irritation. This innovation project aimed to determine the effectiveness of cleaning the perianal area using water against diaper dermatitis in toddlers with diarrhea.

Method

This research was a scientific evidence-based nursing care application or Evidence Base Nursing Practice using the Patient, Intervention Comparison, and Outcome (PICO) approach and literature studies through review of journals related to cleaning the perianal area to prevent and manage diaper dermatitis. The PICO model is a method for identifying and formulating questions about a problem (Gardner, Kanaskie, Knehans, Salisbury, & Doheny, 2016).

Based on the PICO model, the following problems identified in the implementation of the EBNP are: 1) Patients: 34 patients under five who experience diarrhea. 2) Intervention: The intervention in implementing the EBNP is to clean the perianal area with water. 3) Comparison: Cleaning the perianal area with wet tissues. 4) Result: Cleaning the perianal area with clean water is proven to reduce and prevent diaper dermatitis. The results of applying/implementing [the intervention on] the diaper dermatitis were seen by assessing the diaper dermatitis score using the Scoring System for Diaper Dermatitis Scale (SSDDS).

The PDSA method is a way of testing the implemented changes. It guides the thinking process, breaks down the task into steps, evaluates the results, then refines and re-tests them. The implementation of the EBNP application starts with preparing the tools and materials needed for the treatment of the perianal area, then assessing the severity of the diaper dermatitis using the Scoring System Diaper Dermatitis Scale. After assessing the diaper dermatitis score, the researchers recommended parents [about the treatment management of diaper dermatitis] by providing examples and educating parents about cleaning the perianal area. For the intervention group, the researchers advised parents to clean the perianal area using water. Diaper dermatitis score assessment was carried out again on day 2, 3 and 4 to see if the diaper dermatitis score has decreased or increased. In this implementation of the EBNP, 34 patients were divided into a control group and an intervention group. Each group consisted of 17 patients.

Results

The results on the characteristics of the patient respondents in the application/implementation of EBNP of cleaning the perianal area to reduce the incidence of diaper dermatitis that was carried out on 34 respondents who were divided into two groups, namely the control group and the intervention group - are as follows:

Table 1. The Distribution of Respondent Characteristics by Age, Type of Diapers, and Use of Barriers in Children's Infection Rooms in February-April 2017 (n = 34)

No.	Variable	Wet Tissue (n = 15)		Water (n = 15)		Total	
		n	%	n	%	n	%
1	Age						
	Baby	15	88.3	9	52.9	24	70.9
	Toddler	2	11.7	6	35.3	8	23.5

Cont... **Table 1. The Distribution of Respondent Characteristics by Age, Type of Diapers, and Use of Barriers in Children's Infection Rooms in February-April 2017 (n = 34)**

	Preschool Children	0	0	2	11.7	2	5.9
	Total	17	100	17	100	34	100
2	Diaper Type						
	Absorbent	17	100	17	100	34	100
	Non Absorbent	0	0	0	0	0	0
	Total	17	100	17	100	34	100
3	Use of Barriers						
	Yes	8	47.1	6	35.3	14	41.1
	Not	9	52.9	11	64.7	20	58.9
	Total	17	100	17	100	34	100

Table 3.1 shows that in the control group most of the respondents are in the baby age category, with 15 respondents (88.3%); similarly, the intervention group is mostly consisted of most of respondents in the baby age category, with 9 respondents (52.9%). Based on the type of diaper, the respondents in both groups are 100% using the absorbent diaper type. Based on the use of barriers, the respondents in the control group mostly do not use barrier, with 9 respondents (52.9%), similarly, in the intervention group most of the respondents (11 people (64.7%)) also do not use a barrier.

The analysis of differences in diaper dermatitis scores in the intervention group and the control group was aimed to analyze the diaper dermatitis scores before and after the action. The homogeneity test used was the Levine test; the test results show that the variables of age, diaper type, and barrier use have the same variants in the two groups. Meanwhile, the data normality test used was the Shaphiro-Wilk analysis. The results of the data normality test show that the diaper dermatitis score - both before and after the intervention - have a p value of < 0.05, which means that the data in this research were not normally distributed. Therefore, for data that were not normally distributed, the type of statistical test used was the non-parametric test, namely Wilcoxon test to test a paired comparison between two groups.

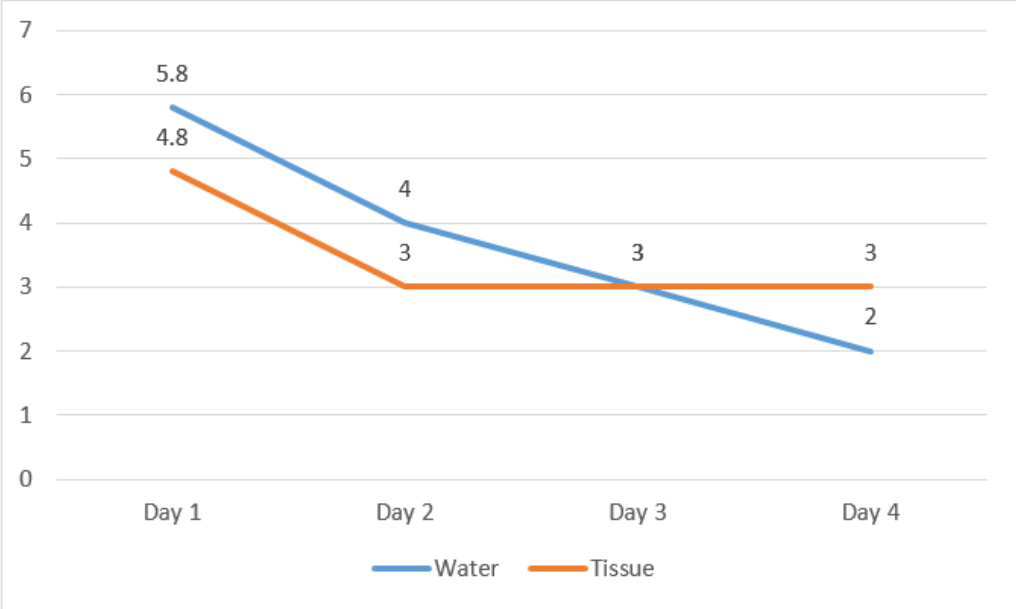

Figure 1 Line Chart of the Difference in Diaper Dermatitis Score in the Intervention and Control Groups

Based on Figure 1, it can be seen that the decrease in diaper dermatitis scores in the intervention group is better than in the control group.

Table 2. The Analysis of Difference in Diaper Dermatitis Score between the Intervention and Control Groups in the Second, Third and Fourth Days (n = 34)

Variable	Group	p value
Diaper dermatitis score	Intervention Group Control Group	0.179

Based on table 2, it can be seen that there is no significant difference in the difference in diaper dermatitis scores between the intervention group and the control group ($p > 0.05$).

Discussion

Damage to skin integrity often occurs in children who suffer from diarrhea. Due to the frequent defecation, the area of the skin around the perianal is more often exposed to feces, resulting in irritation and redness of the skin.[8] Feces can cause skin irritation. Bacterial enzymes present in feces reduce urea and release ammonia. This causes an increase in pH and activates fecal proteases and lipases. This enzyme causes erythema, damages skin integrity, and increases the incidence of diaper dermatitis.[9] Diarrhea is one of the causes of diaper dermatitis.[10] Another study also explains that diarrhea is a significant factor that increases the risk of diaper dermatitis in children aged 1-24 months.[11]

Diarrhea is a disease that can cause injury or damage to the skin. Injuries to the skin or the presence of damage to the skin can be considered as indicators of the quality of care in an acute care setting.[12] Patients who use diapers and experience diarrhea are at risk of experiencing damage to skin integrity in the perianal area - or what is often called as diaper dermatitis. Preventing damage to the skin requires proper procedures. Efforts that can be made to prevent and manage patients with diaper dermatitis - one of which is by cleaning the perianal area regularly with water. After defecating, rinse the perianal area gently with water without rubbing it hard.[6]

There are many variations that can be used to clean the perianal area, such as: cleaning with soap and water, cleaning with disposable or wet tissue, and cleaning

with the traditional way which uses water. Nowadays, many parents prefer to use tissue to clean the perianal area of their babies/children. A study on 117 children aged 6-24 months which was aimed to investigate the effectiveness of tissue and water [in cleaning the perianal area] against the incidence of diaper dermatitis, reveals that no significant is found in the difference of diaper dermatitis severity between the tissue and water groups. However, few diaper dermatitis in the area of *candidiasis intertriginosa* is found in patients who used tissue.[5]

Similarly, based on the results of the innovation project implementing the EBNP, it is found that there is no significant difference between cleaning the perianal area using water and tissue ($\rho > 0.05$). The results of this research are in accordance with the research by Adalat,which concludes that there is no significant relationship between the use of tissue, water, or a combination of both. Another similar study also shows that there is no significant difference in skin hydration in the two groups, although there is mild dermatitis found in babies who are cleaned using cotton and water.[13]

A study has suggested that there is a significant relationship between perianal skin care and the risk of damage to perianal skin integrity in babies with diarrhea. Perianal skin care carried out in this study was by using water and cotton to clean the perianal area. This result indicates that the risk of damage to skin integrity in the perianal area of children/toddlers with diarrhea and receive skin care according to practice standards is lower than in children/toddlers with diarrhea and receive skin care according to hospital habits.

This study reveals that there is not enough evidence to support or reject the use of water to clean the perianal area to prevent and treat diaper dermatitis in children under five. This can be caused by several factors, among others, the inadequate number of respondents, the age of the respondents, the use of barriers, and the type of diaper.

In this implementation of the EBNP, the results show that the majority of respondents' ages are in the baby age category. This is consistent , that the peak incidence of diaper dermatitis is between the ages of 9 and 12 months. The highest prevalence of diaper dermatitis occurs in babies aged 9 to 12 months; this may be due to the introduction of solid foods during this period which causes high frequency of bowel movements and urination in some babies. Breastfeeding also plays an important role in the prevention of diaper dermatitis because the feces of exclusively breastfed babies have a lower pH and protease and lipase activity.[14]

Another factor that can affect [the incidence of diaper dermatitis] is the use of diapers. Most of the respondents in this EBNP implementation research use an absorbent type diaper. Indeed, in order to prevent diaper dermatitis, experts recommend minimizing the use of diapers and if you use diapers [for your babies] choose the disposable diapers and you should change [your babies'] diapers more frequently.[14] The use of disposable diapers is recommended because they contain absorbent components, such as hydrocellulose gel, which is very good for preventing moist conditions in skin.[15] Disposable diapers with super-absorbent gel, an external porous cloth layer, and an absorbent outer layer have been shown to reduce the incidence of diaper dermatitis.

Besides the use of diapers, the use of skin barriers is another factor that can cause the incidence of dermatitis. Based on the results of this implementation of the EBNP, it is found that some respondents use a barrier as an effort to prevent diaper dermatitis. Ersoy-Evans, Akinci, Dogan, and Atakan explain that the use of skin barriers such as creams is an important method to prevent and treat diaper dermatitis. Besides preventing contact between skin and urine and feces, creams can improve the healing of diaper dermatitis, especially in babies. These creams usually contain zinc oxide, petrolatum jelly, cod liver oil, dimethicone, and dexpanthenol which can cure diaper dermatitis.

A study found that water is not statistically significant for cleaning perianal area but clinically water is shown to reduce the diaper dermatitis score when it is compared to using a tissue (wet tissue). Wet tissue can cause complications, especially because of the presence of preservatives such as methylisothiazolinone. The use of wet tissue (baby wipes) to clean the perianal area is as light as using water where there is no change in skin condition. But wet tissue contains preservatives and fragrances which have the potential to be sensitized topically, thus using wet tissue is not recommended if

damage to skin integrity has occurred.[11]

Finally, using water to clean the perianal area is an effective intervention that does not require large costs and does not cause irritation. Nurses must be able to identify risk factors, preventive measures, and treatments that will be given to prevent diaper dermatitis – one of which is by regularly cleaning the perianal area.[14]

Conclusion

There is no significant difference in the dermatitis diaper scores after being given perianal care – both in the intervention group and the control group. However, the use of water has been clinically proven to lower the diaper dermatitis score when compared to the use of wet tissue.

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