

THE EFFECT OF VIRGIN COCONUT OIL IN REDUCING DIAPER RASH AMONG INFANTS AGED 0-12 MONTHS

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Abstract: Diaper rash is a common skin problem in babies, caused by inflammation of the area covered by a diaper. One of the alternatives to reduce the level of diaper rash is by applying virgin coconut oil (VCO), which contains antibacterial properties. This study aims to determine the effect of VCO on reducing the degree of diaper rash in infants aged 0-12 months at Krueng Sabee Public Health Center. This study employed a quantitative approach with a quasi-experimental design with one-group pretest and posttest. The population of this study was 30 infants aged 0-12 months with diaper rash problems, selected using a purposive sampling technique. Data collection was conducted using a Wilcoxon test. The results show that before the application of VCO, all respondents (100%) experienced diaper rash categorized into mild, moderate, and severe degrees. After the intervention, a total of 27 babies (93.3%) showed improvement in skin condition, and most of the babies no longer had signs of rash skin. The result of the Wilcoxon test obtained a sig value of 0.00 ($p < 0.05$), which indicates that there is a significant effect of VCO in reducing the degree of diaper rash among infants.

Keywords: diaper rash, virgin coconut oil, baby

1. Introduction

Infant skin is highly sensitive and prone to irritation, mainly due to its lower moisture content compared to adult skin. Various skin problems commonly experienced by infants include atopic dermatitis, seborrhea, boils, miliaria (heat rash), allergies, and inflammation that appears as a skin rash, better known as *diaper rash*. *Diaper rash* is one of the most common skin problems in babies, caused by inflammation in areas covered by diapers, including the genital area, around the thigh folds, buttocks, and lower abdomen(1).

According to data from the World Health Organization (WHO) in 2021, approximately 250,000 out of one million babies receiving outpatient care experience severe diaper rash. The global prevalence of diaper dermatitis ranges from 7–35%, while in infants and children it can reach 17–43%. A statement from the Indonesian Ministry of Health in 2023 shows a 65% increase in diaper rash cases, reflecting an increasingly worrying child health issue. Regionally, Aceh Province recorded 53,461 cases of dermatitis in 2022, with a prevalence of 68.8%. Some of the areas with the highest rates include Aceh Jaya (30.5%), West Aceh (27.5%), and South Aceh (22.8%)(2); (3)

Diaper rash commonly occurs due to the use of disposable diapers that are airtight, causing the diaper area to become damp and hot, which triggers the growth of bacteria and fungi that cause irritation. Continuous contact with diapers, feces, baby skin, and urine can cause irritation to the baby's skin(4). Symptoms include redness, itching, pain, and blistering of the skin. If left untreated, it can cause secondary infections and disturb the baby's comfort. Treatment can be done pharmacologically, such as the use of zinc oxide ointment and antifungal cream. On the other hand, non-pharmacological treatment includes the use of topical alternatives, one of which is *virgin coconut oil* (VCO). VCO contains lauric acid, capric acid, vitamin E, MCT, and polyphenols that act as natural antibacterial, antifungal, and anti-inflammatory agents that support the skin healing process(5). Research results show that using VCO twice a day for five days effectively reduces the intensity of diaper rash. Based on

these findings, researchers are interested in conducting a study on the effectiveness of VCO in reducing the severity of diaper rash in infants aged 0–12 months at the Krueng Sabee Community Health Center.

2. Literature Review

2.1 Infants

Infants are children aged 0 to 12 months who are in their "golden age," a critical and fundamental period in their growth and development. At this stage, infant development is greatly influenced by the attention, care, and stimulation provided by their environment. Infant growth and development occurs gradually and systematically, encompassing various physical, cognitive, and emotional changes. Each age phase shows certain achievements, from lifting the head, sitting, crawling, standing, to starting to say a few syllables. The aspects of infant growth and development consist of physical growth (such as an increase in weight and height) and the development of abilities that include gross motor skills, fine motor skills, language, and social behavior. Proper monitoring and support in each of these aspects is very important to ensure that babies grow and develop optimally according to their potential(6) .

2.2 Diaper Rash

Diaper rash is an inflammation of the baby's skin that occurs in the genital area, buttocks, and thigh folds due to prolonged use of diapers. This condition is caused by prolonged exposure to moisture, urine, feces, friction, irritants, and bacterial or fungal infections such as *Candida albicans*(7) . Diaper rash can cause discomfort, pain, and make babies fussy. If not treated immediately, this rash can cause secondary infections and affect the baby's growth and development. Clinically, the rash is characterized by redness, spots, blisters, and even burn-like wounds in severe cases(8) .

There are two main classifications: irritant dermatitis caused by friction and moisture, and candidal dermatitis caused by a fungal infection, characterized by bright red lesions and satellite lesions. The severity of the rash is assessed using a DDIS score ranging from 0 to 8. Prevention of diaper rash can be achieved by maintaining cleanliness and dryness in the diaper area, changing diapers regularly, and allowing time without a diaper so that the skin can breathe(9) . Management of diaper rash includes pharmacological approaches (such as hydrocortisone cream and topical antibiotics) and non-pharmacological approaches (such as the use of antibacterial virgin coconut oil). If left untreated, diaper rash can lead to serious complications such as diaper candidiasis, sleep disturbances, fussiness, and changes in the baby's eating patterns(5) .

2.3 Virgin Coconut Oil (VCO)

Virgin Coconut Oil (VCO) is pure coconut oil produced without extreme heating or the use of chemicals, thereby preserving bioactive compounds such as lauric acid, vitamin E, and polyphenols. The medium-chain fatty acids (MCFAs) in VCO enable effective penetration into the skin layers, providing natural moisturizing effects that help maintain hydration, elasticity, and accelerate skin regeneration(10) . Additionally, VCO contains anti-inflammatory, antipyretic, and analgesic effects, and is able to increase the formation of new blood vessels in wounds (11) . Thus, it plays an important role in the prevention and treatment of various skin problems, including diaper rash in babies with minimal risk of side effects. These advantages make VCO a safe and effective topical therapy alternative compared to conventional pharmacological products(12) .

The use of VCO in diaper rash care provides significant benefits in reducing inflammation, irritation, and preventing secondary infections caused by microorganisms such as *Candida*

albicans. Studies show that VCO can reduce redness and accelerate the healing process of baby's skin, thanks to its antimicrobial properties and optimal nutrient absorption. Additionally, VCO is easy to apply, economical, and widely available, making it highly suitable as a non-pharmacological therapy for caring for sensitive baby skin. With its high safety profile and multifunctionality, VCO has the potential to become the primary choice in diaper rash management and contribute to overall baby skin care(13) .

2.4 DDSIS (*Diaper Dermatitis Severity Index Score*)

The measurement results are determined using the DDSIS (*Diaper Dermatitis Severity Index Score*) instrument, which assesses the severity of diaper rash with scores ranging from 0 to 8. The severity of the rash is categorized into several groups: no rash (score 0), mild rash (score 1-2), moderate rash (score 3-4), and severe rash (score 5-8)(14) .

3. Method

This study used a quasi-experimental design with a one-group pretest-posttest design. The study population consisted of all infants aged 0–12 months who experienced diaper rash at the Krueng Sabee Community Health Center () with a sample size of 30 infants, while the sample was determined through purposive sampling according to the inclusion and exclusion criteria. The instruments used were the Diaper Dermatitis Severity Index Score (DD SIS) and standard operating procedures (SOP) and the administration of Virgin Coconut Oil (VCO). The research procedure included initial measurement of the degree of diaper rash (pretest) with the administration of VCO twice a day in the morning and evening after bathing for seven consecutive days and re-measurement (posttest). The data were analyzed quantitatively using univariate analysis for frequency distribution and bivariate analysis using the Wilcoxon test to determine the effect of VCO administration on the reduction of diaper rash severity.

4. Findings and Discussion

4.1 Demographic Data

Demographic Data of Respondents Receiving *Virgin Coconut Oil (VCO)* for *Diaper Rash* at the Krueng Sabee Community Health Center

No	Type	Category	F	%
1	Mother's Age	27-30 years	23	76.7
		31-34 years	7	23.3
		Total	30	100.0
2	Child's Age	0-1 Month	0	0.00
		(Newborn)	30	100.0
		1-12 Months	30	100.0
		(Infant)		
3	Gender	Total		
		Male	23	76.7
		Female	7	23.3
		Total	30	100.0

4	Address	Monmata	8	26.7
		Padang Datar	6	20.0
		Krueng Sabee	5	16.7
		Paya Semantok	6	20.0
		Datar Luas	5	16.7
		Total	30	100.0

4.2 Univariate Analysis

Frequency distribution before and after VCO application on *diaper rash* at the Krueng Sabee Community Health Center

No	Type	Category	F	%
1	Diaper Rash Pre-test	No Rash	0	0
		Mild	14	46.7
		Moderate	11	36.7
		Severe	5	16.7
		Total	30	100.0
2	Posttest Diaper Rash	No rash	27	93.3
		Mild	2	6.7
		Moderate	1	3.3
		Severe	0	0
		Total	30	100.0

4.3 Bivariate Analysis

1. Data Normality Test

Category	Shapiro-Wilk		
	Statistic	df	Sig.
Diaper Rash Pretest	.892	30	.005
Posttest Diaper Rash	.350	30	.000

2. Wilcoxon test

Pre-test and post-test diaper rash with Wilcoxon test

Pre-test & post-test diaper rash	N	Mean Rank	Sum of Ranks	Z	Asymp. Sig. (2-tailed)
Negative Ranks	30 ^a	15.50	465.00	15.50	465.00
Positive Ranks	0 ^b	.00	.00	.00	.00
Ties	0 ^c				
Total	30				

The results showed that before the administration of Virgin Coconut Oil (VCO), all 30 respondents (100%) experienced diaper rash with varying degrees of severity, namely 14 people (46%) experienced mild rash, 11 people (36.7%) experienced moderate rash, and 5 people (16.7%) experienced severe rash. This condition was characterized by redness, irritation, scaly skin, and discomfort in infants, which was theoretically caused by multifactorial factors such as high humidity, chemical irritation, friction, and bacterial or fungal infections. These findings are reinforced by a study by Silaban et al. (2022), which showed that the majority of infants experienced a reduction in the severity of their rash after using VCO, with more than half of the infants recovering completely. The researchers assumed that the age of the baby, gender, type of diaper used, and level of hygiene affect the severity of diaper rash, where younger babies, more active male babies, and the inappropriate use of disposable diapers and poor hygiene are the main risk factors that exacerbate diaper rash.

This study proves that applying Virgin Coconut Oil (VCO) twice a day for seven days effectively reduces the severity of diaper rash in infants aged 0–12 months, with 27 infants (93.3%) out of a total of 30 respondents showing significant improvement to complete recovery, including cases with severe rashes. Theoretically, the effectiveness of VCO is explained by its lauric acid and capric acid content, which have antimicrobial and anti-inflammatory properties, helping to fight bacteria and fungi that cause skin irritation and accelerate skin regeneration through the formation of a protective layer. In addition, the results of this study are in line with research by (12), which shows that there is a significant difference after the administration of *Virgin Coconut Oil (VCO)* in infants aged 0-12 months, with a p-value of 0.000 (<0.05) and an average reduction score of 1.175. The Wilcoxon statistical test results in this study also prove that the administration of VCO has a real effect on the healing of diaper rash with a significance of < 0.05 , so it can be concluded that there is an effect of VCO administration in reducing the severity of diaper rash in infants. Based on the researcher's assumptions, the effectiveness of VCO is not only due to its bioactive properties but also related to consistency of use, the sensitive skin condition of infants, and environmental factors such as humidity and hygiene. Therefore, regular use of VCO can be an effective natural solution to prevent and treat diaper rash in infants.

5. Conclusion and Recommendation

There is an effect of *virgin coconut oil (VCO)* administration in reducing the severity of *diaper rash* in infants aged 0-12 months at the Krueng Sabee Community Health Center, with a sig value of 0.000, which is less than 0.05.

This study is expected to benefit various parties by increasing mothers' knowledge, experience, and skills in using Virgin Coconut Oil (VCO) to treat diaper rash in babies. For health workers, this study provides additional information on alternative treatments for diaper rash. Educational institutions can use the results of this study as a reference to broaden students' knowledge of infant nursing care. In addition, further research is recommended to examine the continuous use of VCO as a prevention of diaper rash recurrence, compare the effectiveness of VCO with other products, and explore its use on other types of wounds such as diabetic wounds.

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