

THE EFFECT OF VIRGIN COCONUT OIL (VCO) USAGE ON DIAPER RASH HEALING IN NEWBORN BABIES

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ABSTRAK : PENGARUH PENGGUNAAN VIRGIN COCONUT OIL (VCO) TERHADAP PENYEMBUHAN RUAM POPOK PADA BAYI BARU LAHIR

Pendahuluan: Dermatitis popok adalah peradangan pada lapisan kulit terluar, terutama epidermis, terutama di area dan lipatan popok, akibat kontak yang terlalu lama dengan urine dan feses, serta gesekan antara kulit dan bahan popok sekali pakai. Di Indonesia, ruam popok pada bayi memengaruhi sekitar 10 persen populasi. Sementara itu, di Kota Metro, selama Februari hingga Mei 2023, terdapat 24 (12%) bayi yang mengalami iritasi kulit akibat penggunaan popok (ruam popok).

Tujuan: Penelitian ini bertujuan untuk mengetahui pengaruh penggunaan Minyak Kelapa Murni (VCO) terhadap upaya penyembuhan ruam popok pada bayi baru lahir di Puskesmas Margorejo, Kota Metro.

Metode: Penelitian ini merupakan penelitian kuantitatif pra-eksperimen dengan desain one-group pretest-posttest. Populasi penelitian meliputi seluruh bayi baru lahir yang mengalami ruam popok di wilayah kerja Puskesmas Margorejo, Kota Metro selama bulan Maret 2023, yang dipilih dari lima Poskeskel. Teknik pengambilan sampel menggunakan Accidental Sampling, dengan jumlah sampel 30 responden. Variabel bebas dalam penelitian ini adalah penggunaan VCO, dan variabel terikatnya adalah ruam popok pada bayi baru lahir. Analisis bivariat dilakukan dengan uji Wilcoxon.

Hasil: Sebelum pemberian minyak kelapa murni (VCO), bayi mengalami ruam popok sedang dengan skor rata-rata 2,20. Setelah pemberian VCO, terjadi penurunan keparahan ruam popok dari sedang menjadi ringan, dengan skor rata-rata 1,33. Uji Wilcoxon menghasilkan nilai p sebesar 0,000 ($<0,05$), yang menunjukkan perbedaan yang signifikan antara sebelum dan sesudah intervensi. Dengan demikian, dapat disimpulkan bahwa terdapat pengaruh penggunaan minyak kelapa murni terhadap derajat ruam popok pada bayi baru lahir di wilayah kerja Puskesmas Margorejo Kota Metro.

Kesimpulan: Minyak kelapa murni (VCO) dapat digunakan oleh ibu untuk mengatasi ruam popok pada bayinya maupun untuk mengatasi masalah kulit lainnya.

Kata kunci: Bayi baru lahir, ruam popok, minyak kelapa murni

ABSTRACT

Introduction: Diaper dermatitis is an inflammation of the outermost layer of the skin, mainly the epidermis, especially in the diaper area and folds, resulting from prolonged contact with urine and feces, as well as friction between the skin and disposable diaper materials. In Indonesia, diaper rash in infants affects around 10 percent of the population. Meanwhile, in Metro City, during February to May 2023, there were 24 (12%) infants who experienced skin irritation due to diaper usage (diaper rash).

Objective: The study aimed to determine the effect of using Virgin Coconut Oil (VCO) on diaper rash healing efforts in newborn babies at Margorejo Health Center in Metro City.

Method: This was a pre-experimental quantitative study with a one-group pretest-posttest design. The population included all newborn babies who experienced diaper rash in the working area of Margorejo Health Center in Metro City during March 2023, selected from five "Poskeskel". The sampling technique employed Accidental Sampling, with a sample size of 30 respondents. The independent variable in this study was the application of VCO, and the dependent variable was diaper rash in newborn babies. Bivariate analysis was conducted using the Wilcoxon test.

Results: Before the application of Virgin Coconut Oil (VCO), the infants experienced moderate diaper rash with an average score of 2.20. After the application of VCO, there was a decrease in diaper rash severity from moderate to mild, with an average score of 1.33. The Wilcoxon test yielded a p-value of 0.000 (<0.05), indicating a significant difference between before and after the intervention. Thus, it can be concluded that there is an

influence of using virgin coconut oil on the degree of diaper rash in newborn babies in the working area of Margorejo Health Center in Metro City.

Conclusion: Virgin Coconut Oil (VCO) can be used by mothers to address diaper rash in their infants or to address other skin issues.

Keywords: Newborn babies, diaper rash, virgin coconut oil

INTRODUCTION

The use of disposable diapers has become a preferred choice for baby and toddler care due to its perceived convenience and effectiveness among many parents, even within healthcare services. Disposable diapers are single-use diapers designed to absorb a baby's urine and feces, preventing them from soiling clothing, bedding, and the baby's surroundings. Based on statistical data (Ministry of Women Empowerment and Child Protection and Central Bureau of Statistics, 2019), the number of children in Indonesia reached 79.5 million in 2018, equivalent to 30.1% of the total population. The current usage rate of disposable diapers in Indonesia stands at 85%, which is still low compared to Japan, where the annual per capita usage of diapers averages 1,735 pieces (UCID, 2020).

According to the research by Purwanti and Retnaningsih (2022), diaper rash can occur when a baby's skin is exposed to urine or feces containing ammonia, chemicals, soap, or detergents present in the diaper for an extended period. Diapers made from plastic or rubber materials can also cause skin irritation in babies. Conditions such as diarrhea, fungal infections, and formula feeding can contribute to a higher incidence of diaper rash in babies compared to breastfed infants. This is due to the different chemical composition of urine and feces, as well as a history of allergies in some babies. Additionally, environmental factors such as the tropical climate contribute to consistently high humidity levels, increasing the risk of irritation in babies' skin.

If left untreated, diaper dermatitis can lead to increased morbidity in infants. It can also spread and disrupt the comfort, growth, and development of the baby. Management of diaper dermatitis can involve both pharmacological and non-pharmacological approaches. Pharmacological management may include the use of topical hydrocortisone and topical steroids applied to the skin surface to reduce inflammation and rash. However, continuous use of these medications can have adverse effects on the body. Therefore, alternative non-pharmacological therapies, such as

the one discussed in this study, are essential (Kurniawan and Alfianti, 2022).

One of the non-pharmacological management methods involves utilizing natural ingredients, which can be considered an alternative therapy for treating diaper dermatitis in infants, such as the application of Virgin Coconut Oil (VCO). VCO is oil derived from fresh coconut meat through a controlled heating and distillation process, resulting in essential compounds with a distinctive pleasant aroma (Cahyati, 2015). VCO contains vitamin E, which is beneficial for nourishing and healing damaged skin (Rusana, 2016).

When applied topically, VCO reacts with the bacteria present on the skin, transforming into free fatty acids similar to those found in sebum. Sebum consists of medium-chain fatty acids similar to those in VCO, and its role is to protect the skin from harmful pathogenic microorganisms. Free fatty acids help create an acidic environment on the skin, which can repel bacteria that cause skin diseases (Susanti, 2020).

RESEARCH METHODS

This study employed a pre-experimental approach with a one-group pretest-posttest design. The population for this research included all newborns experiencing diaper rash in the working area of Margorejo Health Center Metro City in March 2023, selected from five "Poskeskel" (sub-district community health centers). The sampling technique used was Accidental Sampling, with a total of 30 respondents.

The research instruments are tools used to measure the variables. For this study, the researcher utilized an observation sheet for measuring diaper rash using a skin grade scale that consists of three categories: 1: mild diaper rash, 2: moderate diaper rash, and 3: severe diaper rash on newborns. The research also followed a standard operating procedure for administering Virgin Coconut Oil (VCO) therapy.

Univariate analysis involved calculating median, minimum, and maximum values, while bivariate analysis utilized the Wilcoxon test due to the non-normal distribution of data.

RESEARCH RESULT

Univariate Analysis

Based on Table 1, it is shown that prior to receiving Virgin Coconut Oil therapy, respondents experienced moderate diaper rash with an average

score of 2.20, with an SD of 0.644 and a min-max range of 1-3. After receiving Virgin Coconut Oil therapy, respondents exhibited mild diaper rash with an average score of 1.33, an SD of 0.606, and a min-max range of 0-2.

Table 1
Diaper Rash before Administering Virgin Coconut Oil Therapy in Newborn Babies in the Working Area of Margorejo Health Center Metro City

Diaper Rash Severity	n	Mean	SD	Min-Max
Before (Pretest)	30	2,20	0,664	1 – 3
After (Posttest)	30	1,33	0,606	0 - 2

Bivariate Analysis

Table 2
Diaper Rash Before and After Administering Virgin Coconut Oil Therapy in Newborn Babies in the Working Area of Margorejo Health Center Metro City

Diaper Rash Severity	Mean	Gap	Min-Maks	P value
Before (Pretest)	2,20	0,87	1 – 3	0,000
After(Posttest)	1,33		0 - 2	

Table 2 shows that out of the 30 respondents, there was a decrease in diaper rash severity with an average reduction from 2.20 (moderate diaper rash) to 1.33 (mild diaper rash), with a difference of 0.87. The statistical test result yielded a p-value of 0.000 (<0.05), indicating a significant difference between pretest and posttest intervention. Therefore, it can be concluded that there is an influence of using virgin coconut oil on the severity of diaper rash in newborn babies in the working area of Puskesmas Margorejo Kota Metro.

DISCUSSION

The degree of diaper rash in newborns before being given Virgin Coconut Oil

Based on the results of the conducted research, it is known that before receiving Virgin Coconut Oil therapy, the average degree of diaper rash experienced by the respondents was moderate, with a value of 2.20, a standard deviation (SD) of 0.644, and a minimum-maximum value of 1-3.

Diaper rash, also known as diaper dermatitis, is a skin disorder that occurs in areas covered by a diaper, and it appears after the use of diapers. Diaper rash is diagnosed to occur in the lower abdomen, lower waist area, gluteal and skin folds, inner thighs, and genital area (Elfaituri, 2016).

Several causes of diaper rash exist, one of which is prolonged and repeated contact with irritants, especially urine and feces. Chemicals present in diaper cleaning products such as soap, detergent, bleach, fabric softeners, and chemicals

used in the manufacturing of disposable diapers can also cause diaper rash. Although urine and feces are the main culprits, other contributing factors also play a role in the occurrence of diaper rash. Prolonged contact between wet diapers and skin affects various skin areas. Frequent and prolonged friction can lead to skin damage or irritation, increasing skin permeability and the number of microorganisms. Consequently, the skin becomes sensitive and prone to irritation (Puspitasari et al., 2016).

The above research findings align with the study conducted by Nikmah Ainun et al., (2021), which indicated that prior to receiving Virgin Coconut Oil (VCO), 16 infants experienced mild and moderate diaper rash. Among them, 13 infants (81.2%) fell into the category of mild diaper rash, and 3 infants (18.8%) fell into the category of moderate diaper rash.

Supported by the study conducted by Puspitasari et al., (2016), which showed that prior to receiving Virgin Coconut Oil, there were 20 infants aged 1-12 months who presented with skin issues. Among these infants, 8 experienced diaper rash (40%), 7 had eczema (35%) and 5 had heat rash (25%).

According to the researchers' opinion, many infants experienced moderate and severe diaper rash. The respondents who experienced diaper rash mainly had it on their buttocks and thighs. Respondents felt itching, which worsened when the diaper was filled with urine and feces. Many

respondents also reported redness, irritation, and inflammation. Additionally, some infants experienced erythema and vesicles. Diaper rash on infants also spread to the abdominal and genital areas, causing itching and redness.

The signs and symptoms observed in the respondents were indicative of varying degrees of diaper rash. These symptoms ranged from mild (score 1) to moderate diaper rash (score 1.5), moderate diaper rash (score 2), moderate to severe diaper rash (score 2.5), and severe diaper rash (score 3). In the early stages, the signs included mild redness in the limited area of skin around the diaper region, accompanied by minor abrasions or light skin wounds. The affected area appeared shiny, sometimes resembling a burn, with the appearance of red spots, and occasionally becoming damp and swollen in areas that were in prolonged contact with the diaper, such as the thighs.

This situation occurred due to the habits of mothers in the Margorejo Public Health Center area of Kota Metro. Before using diapers, mothers applied eucalyptus oil or telon oil to the baby's buttocks, thighs, and abdomen after bathing. They allowed the skin to remain moist without drying thoroughly before putting on diapers. Additionally, mothers often applied powder to the folds of their baby's thighs and buttocks. Another habit was the delay in changing the baby's diaper when it was full of urine and feces. Alongside these habits, it was observed that mothers did not pay adequate attention to their baby's condition, lacking sensitivity to changes occurring on their baby's skin.

Degree of diaper rash in newborns after being given Virgin Coconut Oil (VCO)

Based on the results of the conducted study, it is known that after receiving Virgin Coconut Oil therapy, the average degree of diaper rash among respondents shifted to mild, with a value of 1.33, a standard deviation (SD) of 0.606, and a minimum-maximum value range of 0-2. This indicates that the administration of Virgin Coconut Oil therapy resulted in a reduction in the severity of diaper rash, with no respondents experiencing severe diaper rash.

According to Frilasari (2016), prevention of diaper rash can be achieved by maintaining the cleanliness and moisture of the baby's skin, particularly in the genital area, buttocks, and groin folds. Avoid using baby powder as it can block the urinary tract and accumulate in the genital area, creating a conducive environment for bacterial growth. When changing diapers, use protective creams or ointments containing zinc oxide or petrolatum to form a protective layer on the baby's

skin. Change diapers as frequently as possible, every 2-3 hours and whenever the diaper is full.

Pharmacological treatment for diaper rash involves the use of creams containing zinc oxide. For severe cases of diaper rash, creams containing antibiotics and antifungal agents such as nystatin, clotrimazole, miconazole, and hydrocortisone (a corticosteroid to reduce inflammation) may be prescribed. Pharmacological management of diaper rash can include alternative topical treatments like olive oil and Virgin Coconut Oil. Both of these oils contain high levels of vitamin E, particularly α -tocopherol (around 90%) (Nikmah Ainun et al., 2021).

Virgin coconut oil is oil made from fresh coconut flesh, processed through controlled heating or even without heating, and without the use of chemicals. The distillation of coconut oil in this manner preserves the essential compounds needed by the body, keeping them intact, and results in oil that feels soft and carries the distinct pleasant aroma of coconut (Cahyati et al., 2015).

In line with the research conducted by Mustaqimah et al. (2021) titled "The Use of Virgin Coconut Oil (VCO) Effectively Prevents Newborn Diaper Rash," the study showed an average Diaper Dermatitis Severity Intensity Score (DD SIS) based on treatment days on the 1st, 7th, and 14th days for the intervention group (0.03, 0.00, and 0.03), while the control group (0.00, 0.33, and 0.45). There was a significant difference in DD SIS scores between the intervention group with VCO and the control group without VCO (p-value 0.020).

Another study conducted by Susanti (2020) titled "Efforts in Healing Diaper Rash Using Virgin Coconut Oil (VCO)" stated that before being given VCO, nearly half of the diaper rashes were of moderate to severe degrees among the respondents, with 10 respondents (43%) falling into this category. After the application of VCO, the majority of diaper rashes improved, with 12 respondents (53%) experiencing mild diaper rashes. The results of the univariate statistical test showed a Shapiro-Wilk normality test value of 0.667 > 0.005, indicating a normal distribution. Consequently, a Paired T-Test was employed for the bivariate analysis, yielding a p-value of 0.000, which is less than 0.05, suggesting the influence of VCO in countering diaper rash in infants aged 0-2 years in the Mandangin Island center of Banyuwangi Sampang Health Center.

According to the researcher's opinion, most diaper rashes in infants experienced a reduction in severity after being treated with Virgin Coconut Oil (VCO). Mothers applied VCO after bathing, once the baby's body was dry, particularly in the areas of

the buttocks, abdomen, thighs, and genitalia that were affected by diaper rash. This change in behavior occurred due to mothers receiving information about how to care for and treat diaper rash using alternative methods, such as VCO. As a result, mothers gained a better understanding of diaper rash, its treatment, and care.

It's evident that a significant number of infants with diaper rash experienced a reduction in the signs and symptoms of diaper rash after being treated with VCO. The reduction was observed in areas such as the thighs, buttocks, abdomen, and genitalia. Most mothers followed all the instructions for applying VCO to treat diaper rash in their babies. The reduction in diaper rash severity occurred because mothers applied Virgin Coconut Oil (VCO) by gently rubbing it onto the affected areas twice a day after bathing for a period of 7 days.

The choice to apply VCO after bathing is due to the fact that the skin is refreshed after a bath, allowing the components of VCO to quickly establish a microbial barrier that can enhance or maintain tissue tolerance. Additionally, the application of virgin coconut oil on the skin is absorbed by the pores, and then transported through the bloodstream throughout the body. Afterward, the baby's diaper is put on, and mothers refrain from using powder.

The Influence of Virgin Coconut Oil (VCO) Usage on Diaper Rash Healing in Newborns

Based on the results of the conducted research, it is known that out of the 30 respondents, there was a decrease in diaper rash severity. The average severity decreased from 2.20 (moderate diaper rash) to 1.33 (mild diaper rash), with a difference of 0.87. The statistical test results yielded a p-value of 0.000 (<0.05), indicating a significant difference between before and after the intervention. Therefore, it can be concluded that there is an influential effect of using virgin coconut oil on diaper rash severity in newborns within the working area of Margorejo Health Center Metro City.

Virgin Coconut Oil (VCO), as stated by Susanti (2020), is pure coconut oil made from fresh coconut materials. It undergoes a controlled heating process or is left unheated entirely, is free from chemicals and RBD (refined, bleached, deodorized) processing. During the distillation process of Virgin Coconut Oil (VCO), the essential compounds needed by the body remain unchanged. The pure content of VCO includes key compounds such as lauric acid and capric acid, which have beneficial functions such as acting as antibacterial, antiviral, and antifungal agents. This distillation process

results in clear, low water content and low fatty acid content Virgin Coconut Oil (VCO) that has a pleasant smell and can be stored for up to 12 months.

VCO contains vitamin E that is useful for nourishing the skin and healing skin cracks. When applied topically, VCO reacts with the bacteria present on the skin, transforming into free fatty acids similar to those found in sebum. Sebum is composed of medium-chain fatty acids, just like those in VCO, and its role is to protect the skin from the threat of pathogenic microorganisms. Free fatty acids help create an acidic environment on the skin, which can repel bacteria that cause skin diseases. (Kurniawan & Alfiyanti, 2022). The benefits of VCO, according to Karisma & Lestari (2017), include being a source of energy, a protective antioxidant, a source of nutrition for children's growth, beneficial for pregnant and breastfeeding mothers, a skin care agent effective for all skin types, including dry skin, and effective in reducing symptoms of dermatitis and inflammation.

The specific fatty acid contents, especially lauric acid and oleic acid, present in VCO exhibit skin-softening properties, which contribute to maintaining skin health. Research involving a mixture of medication and VCO in the form of cream applied to the skin's membrane has proven that there is an increased rate of drug penetration between VCO and dimethyl sulfoxide (DMSO). VCO has also been shown to significantly enhance penetration by up to 40%, compared to DMSO's 10% (Mustaqimah et al., 2021).

The researcher's opinion indicates that the use of Virgin Coconut Oil (VCO) for treating diaper rash in babies is a strong alternative treatment approach. Coconut oil or VCO possesses various beneficial properties such as antibacterial, anti-aging, antioxidant, wound-healing, and anti-inflammatory effects. VCO also aids in healing skin wounds and dermatitis.

VCO is readily available, enabling mothers to use it as a remedy for diaper rash. Mothers can purchase ready-to-use VCO or prepare it themselves due to its easily available raw materials and simple processing. Furthermore, mothers have an understanding of the causes of diaper rash and possess knowledge for effectively caring for babies with diaper rash. The role of medical personnel is also crucial to provide support and serve as role models, especially for mothers dealing with babies who have diaper rash.

Research findings reveal that the administration of VCO has a positive impact as mothers diligently follow the researcher's

recommendations and standard operating procedures, giving VCO to their babies twice a day after bathing for 7 days. Applying VCO after bathing helps maintain skin moisture and establish a microbial barrier, enhancing or maintaining skin tolerance.

The decrease in the severity of diaper rash in babies is also attributed to the natural moisturizing content and medium-chain saturated fatty acids present in VCO. Lauric acid and capric acid in VCO have the ability to kill viruses and exhibit antiviral, antibacterial, antibiotic, and antiprotozoal properties. VCO is a safe solution for preventing dryness and skin peeling, and its benefits for the skin are comparable to mineral oil, without causing adverse side effects. Coconut oil also proves effective in addressing various skin issues such as psoriasis, dermatitis, eczema, and other skin infections.

CONCLUSION

Prior to receiving virgin coconut oil (VCO) therapy, babies experienced moderate diaper rash with an average score of 2.20.

After receiving VCO therapy, babies exhibited mild diaper rash with an average score of 1.33. The administration of VCO therapy significantly influenced the reduction of diaper rash severity in respondents, with a p-value of $0.000 < 0.05$.

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