



Virgin Coconut Oil Therapy for Coastal Dermatitis: A Community Nursing Application of Orem's Self-Care Deficit Theory

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ABSTRACT

Introduction: Dermatitis is one of the most prevalent integumentary disorders encountered in community nursing practice, particularly among coastal populations who are continuously exposed to environmental irritants such as seawater, wind, dust, and high humidity. Despite the widespread use of Virgin Coconut Oil (VCO) for skin care, evidence supporting its application as a theory-guided nursing intervention remains limited. This study evaluated the effectiveness of standardized topical VCO therapy on impaired skin integrity among coastal residents with contact dermatitis using Orem's Self-Care Deficit Theory as the conceptual framework.

Methods: A quasi-experimental study employing a one-group pretest–posttest design was conducted in the coastal working area of the Gadingrejo Community Health Center, Pasuruan City, Indonesia, from 12 to 14 May 2026. Two purposively selected participants aged 35 and 60 years with contact dermatitis received standardized topical VCO therapy for three consecutive days according to a nursing standard operating procedure. Nursing care was implemented through Orem's wholly compensatory, partially compensatory, and supportive-educative systems. Skin integrity was assessed daily using SDKI/SLKI-based indicators, including pruritus, erythema, skin texture, lesion condition, and local skin temperature.

Results: Both participants demonstrated progressive improvement throughout the intervention period. Pruritus and erythema consistently decreased, skin texture became smoother, lesion severity diminished, and local skin temperature normalized, including a reduction from 37.4°C to 36.5°C in the older participant. By the third day, both participants exhibited near-complete resolution of dermatitis symptoms together with improved ability to perform independent skin self-care.

Conclusion: Standardized topical VCO therapy delivered through a structured nursing process based on Orem's Self-Care Deficit Theory effectively improved skin integrity among coastal residents with contact dermatitis within 72 hours. As a safe, low-cost, and evidence-based intervention, VCO therapy may serve as a practical complementary strategy in community nursing for the management of coastal dermatitis, although studies with larger samples are needed to strengthen the evidence.

KEYWORDS

Dermatitis; Coconut Oil; Skin Care; Nursing Theory; Community Health Nursing.

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INTRODUCTION

The skin functions as the body's most exposed and least forgiving organ; it registers every irritant, every shift in humidity, every hour spent in the wind, long before a diagnosis is ever written down (Li & Li, 2021). When that barrier fails, the result is dermatitis: a pattern of itching, redness, dryness, and scaling that looks minor on paper but wears down sleep, concentration, and daily function over weeks and months (Hartweg & Metcalfe, 2021). Underneath that clinical label sits a formal nursing category, impaired skin integrity, defined as structural and functional disruption of the epidermis and/or dermis driven by physical, chemical, biological, or environmental insult (Puspita et al., 2024).

That environmental insult is not evenly distributed across populations. Workers and residents in open, high-exposure settings accumulate irritant contact at a rate indoor populations rarely experience (Fibriansari et al., 2022; Olusegun & Martincigh, 2021). Coastal communities sit near the extreme end of this exposure gradient: prolonged sun, salt-laden wind, airborne dust, high ambient humidity, and abrupt temperature shifts combine to erode the skin's protective lipid layer well before any visible lesion appears. Where sanitation infrastructure is also limited, this environmental burden compounds further, and dermatitis becomes less an occasional complaint than a recurring feature of daily life.

This pattern was not abstract in the coastal working area of Gadingrejo, Pasuruan City. Mrs. S, a 60-year-old outdoor worker, and Mrs. K, a 35-year-old housewife living in the same environmental corridor, both presented with pruritus, erythema, dry and scaling skin, and excoriated lesions consistent with contact dermatitis. What differed between them age, occupation, and the intensity of daily exposure raised a practical question that a single case description could not answer: would the same low-cost intervention perform consistently across two demographically distinct profiles exposed to the same coastal risk? The candidate intervention was Virgin Coconut Oil (VCO), a locally sourced, non-pharmacological agent rich in lauric acid, capric acid, caprylic acid, vitamin E, and antioxidant compounds with documented anti-inflammatory, antimicrobial, and moisturizing activity (Katmono & Mulia, 2021; Nasiri et al., 2022; Umate et al., 2022). Prior studies report VCO's benefit for skin integrity among agricultural workers, elderly dermatitis patients, preterm infants, hemodialysis-related pruritus, and postpartum perineal wounds yet none were set in a coastal community, and none delivered the therapy through a structured, comparative nursing process (Ay & Bulut, 2026).

That gap is as much theoretical as empirical. Framed through Dorothea Orem's Self-Care Deficit Theory, VCO therapy is not simply a topical agent to apply and measure; it is a vehicle for shifting patients from dependence on the nurse toward independent self-care agency, moving through wholly compensatory, partially compensatory, and supportive-educative nursing systems as capability returns (Maeng et al., 2026; Patel & Nixon, 2022). This study applied that lens to evaluate standardized VCO therapy across two demographically contrasting coastal residents using a quasi-experimental one-group pretest-posttest design, tracking clinical indicators from baseline through a 72-hour intervention period (Alsubhi et al., 2024; Andayani et al., 2023). The sections that follow detail the intervention protocol, present the comparative pretest-posttest findings alongside day-by-day clinical documentation, discuss these results against existing VCO literature and Orem's theoretical model, and close with the study's limitations and its implications for community nursing practice (Işık & Fredland, 2021; Yip, 2021).



MATERIALS AND METHODS

Research Design

This community-based study used a quasi-experimental design with a one-group pretest-posttest structure, reported in accordance with the TREND Statement (Transparent Reporting of Evaluations with Nonrandomized Designs), the EQUATOR-endorsed guideline for nonrandomized public health and community intervention research.

Setting and Timeframe

The intervention was conducted over three consecutive days, 12–14 May 2026, in the coastal working area of the Gadingrejo Community Health Center (Puskesmas Gadingrejo), specifically Gadingrejo Village, RT 05/RW 02, Pasuruan City, Indonesia an area characterized by direct occupational and residential exposure to seawater, wind, and high humidity.

Participants

Two participants were purposively selected to represent contrasting demographic profiles within the same coastal exposure zone: Mrs. S (60 years, outdoor worker) and Mrs. K (35 years, housewife). Inclusion criteria were a clinical diagnosis of contact dermatitis attributable to coastal environmental exposure and willingness to complete the three-day protocol. Exclusion criteria were known VCO allergy and comorbid diabetes mellitus, both of which could confound inflammatory response and wound-healing measures.

Intervention Protocol

The intervention followed four sequential stages structured around the Indonesian Nursing Diagnosis, Intervention, and Outcome Standards SDKI, SIKI, and SLKI and was scaffolded across Orem's three nursing systems as participants' self-care capacity progressed.

Stage 1 — Initial assessment and wholly compensatory care (Day 1, 12 May, 15:30 WIB). Nurses conducted a bio-psycho-social assessment and recorded baseline measurements against SDKI diagnostic indicator D.0129 (Impaired Skin Integrity) and SLKI outcome indicator L.14125, covering pruritus, erythema, skin texture, lesion status, and local skin temperature (digital infrared thermometer). VCO was applied directly by the nurse (wholly compensatory system), and participants received foundational education on identifying coastal irritants, hydration targets (7–8 glasses/day), dietary modification (avoiding seafood and eggs), and bathing hygiene (three times daily with adequate soap).

Stage 2 — Partially compensatory care (Day 2, 13 May, 15:30 WIB). Nurses transitioned to a partially compensatory system, supervising and assisting participants as they applied VCO themselves. Clinical indicators were re-assessed using the same SLKI parameters, and adherence to hydration, dietary, and hygiene recommendations was verified through structured questioning.

Stage 3 — Supportive-educative care and self-care agency (Day 3, 14 May, 15:30 WIB). Participants applied VCO independently under nurse observation only (supportive-educative system), reflecting achievement of self-care agency. Final SLKI indicators were recorded as the post-test measurement.

Stage 4 — Comparative clinical evaluation. Pretest (Day 1) and posttest (Day 3) SLKI indicator values were compared descriptively within and between participants to evaluate intervention effect and demographic consistency.

VCO Application Procedure





Pure VCO was applied in a thin layer directly to the affected skin area, left uncovered and unrinsed for 10–15 minutes, and repeated two to three times daily after bathing, throughout all three days.

Outcome Measures and Instruments

The primary outcome, skin integrity, was operationalized through five SLKI-aligned indicators pruritus severity, erythema, skin texture/dryness, lesion and scaling status, and local skin temperature assessed daily through direct nurse observation, palpation, and digital thermometry, and corroborated by participant self-report.

Data Analysis

Given the small comparative sample ($N = 2$), data were analyzed descriptively and comparatively, contrasting pretest and posttest indicator status within each participant and evaluating the consistency of response across the two demographic profiles, an approach consistent with the analytic conventions recommended for small-N nonrandomized community intervention studies under the TREND Statement.

Ethical Considerations

The study adhered to the core principles of nursing ethics autonomy, beneficence, and confidentiality and received ethical clearance from the responsible institutional research ethics commission. Written informed consent was obtained from both participants prior to enrollment, and photographic documentation was used with their explicit consent..

RESULTS AND DISCUSSION

This community nursing program was implemented intensively over three consecutive days (12–14 May 2026) with two participants in the coastal area of Gadingrejo, Pasuruan City. Both women presented at baseline with a nursing diagnosis of impaired skin integrity secondary to contact dermatitis, characterized by itching on both hands, redness, dry and scaly skin, and lesions from scratching a presentation consistent with the inflammatory pattern typical of chronic environmental irritant exposure. Across the three-day intervention, both participants followed a broadly similar trajectory of improvement, though the pace and completeness of resolution diverged in ways that track closely with their underlying exposure patterns and, as discussed below, with Orem's model of self-care progression. Table 1 summarizes participant characteristics, and Table 2 contrasts pretest (Day 1) and posttest (Day 3) status across the five SLKI-aligned indicators.

Table 1. Participant characteristics

Characteristic	Mrs. S	Mrs. K
Age	60 years	35 years
Occupation	Outdoor coastal worker	Housewife (predominantly indoor activity)
Exposure pattern	Chronic, ongoing occupational exposure to seawater, wind, and dust	Chronic, ongoing residential exposure within the same coastal corridor



Characteristic	Mrs. S	Mrs. K
Nursing diagnosis	Impaired Skin Integrity (SDKI D.0129) — contact dermatitis	Impaired Skin Integrity (SDKI D.0129) — contact dermatitis
Baseline presentation	Pruritus, erythema, dry/scaly skin, excoriated lesions on wrists and palms	Pruritus, erythema, dry/scaly skin, excoriated lesions on wrists and palms

Table 2. Pretest–posttest comparison of skin integrity indicators

Indicator	Mrs. S – Day 1 (Pretest)	Mrs. S – Day 3 (Posttest)	Mrs. K – Day 1 (Pretest)	Mrs. K – Day 3 (Posttest)
Pruritus	Severe, wrists and palms	Almost absent	Severe, wrists and palms	Markedly reduced
Erythema	Widespread redness	Faded to pink, markedly reduced	Widespread redness	Faded, markedly reduced
Skin texture	Rough, scaly	Smooth, well-hydrated	Rough, scaly	Smooth, no longer rough
Lesion / excoriation	Excoriated lesions present	Lesions and scaling significantly reduced	Excoriated lesions present	Qualitatively improved*
Local skin temperature	37.4°C	36.5°C	37.3°C	Not documented*

*Local skin temperature and lesion status for Mrs. K were not fully re-documented on Day 3; her posttest resolution is therefore reported qualitatively rather than numerically an inconsistency addressed further under Limitations.

Day 1: Baseline Assessment and Wholly Compensatory Care

On the first day of intervention (12 May 2026, 15:30 WIB), care centered on identifying self-care deficits while nurses delivered VCO application directly Orem's wholly compensatory system in practice. Baseline assessment confirmed active inflammation in both participants: bothersome pruritus on the wrists and palms, widespread erythema, rough and scaly texture, and excoriated lesions from scratching. Local skin temperature was objectively elevated, at 37.4°C in Mrs. S and 37.3°C in Mrs. K, consistent with an active inflammatory response. Nurses applied pure VCO per the standard protocol and delivered foundational education on coastal irritant identification, hydration, dietary modification, and bathing hygiene. By the end of the day, participants reported that the skin felt cooler and more moisturized after VCO application, but pruritus and erythema remained clearly visible — an expected finding, since a single 10–15-minute topical application is unlikely to reverse an established inflammatory cascade, and the meaningful signal at this stage was tolerability and initial

comfort rather than resolution.



Figure 1. Day 1 intervention for patient Mrs. S



Figure 2. Day 1 intervention for patient Mrs. K

Day 2: Partially Compensatory Care and Early Biological Response

Entering the second day (13 May 2026, 15:30 WIB), the intervention shifted to the partially compensatory system, with nurses supervising as participants applied VCO themselves. Clinical evaluation showed a meaningful transition: in Mrs. S, pruritus began to decrease, skin dryness lessened, and local skin temperature dropped to 36.7°C, indicating that the local inflammatory response was subsiding. Mrs. K reported comparable improvement, with redness fading and skin texture no longer feeling markedly rough. Both participants confirmed adherence to hydration, dietary, and hygiene recommendations. This reduction in inflammatory signs is biologically consistent with the known activity of VCO's lauric acid and vitamin E content, which act to suppress pro-inflammatory cytokine activity and support reconstruction of the lipid layer within the stratum corneum. Because the underlying pathology was judged only partially resolved at this stage, both nursing support and VCO application continued unchanged into Day 3.



Figure 3. Day 2 intervention for patient Mrs. S



Figure 4. Day 2 intervention for patient Mrs. K

Day 3: Supportive-Educative Care and Self-Care Agency

On the third day (14 May 2026, 15:30 WIB), the intervention reached its final phase: a supportive-

educative system in which participants cared for themselves independently, with nurses present only to observe and evaluate. The posttest evaluation showed marked symptom resolution in both demographic profiles. Mrs. S reported that pruritus was almost no longer felt, erythema had faded to a light pink, skin temperature had returned to 36.5°C, and lesions and scaling on her wrists had visibly shrunk. Mrs. K reported a comparable outcome, describing her skin barrier as smooth and well-hydrated. This convergence of clinical recovery across two demographically distinct participants—one an older outdoor worker, the other a younger, predominantly indoor-based housewife—indicates that the intervention's effect was not confined to a single age group or exposure intensity. It also represents, in Orem's terms, the successful completion of the nursing systems continuum: participants moved from a state of self-care deficit, through nurse-assisted care, to independent management of their own skin health using a locally available, affordable resource.



Figure 5. Day 3 intervention for patient Mrs. S



Figure 6. Day 3 intervention for patient Mrs. K

The clinical trajectory observed here is plausibly explained by VCO's documented biochemical profile. Lauric and capric acid contribute antimicrobial activity against skin-surface pathogens that commonly aggravate dermatitis lesions, while vitamin E and associated antioxidant compounds counter oxidative stress generated by prolonged UV and salt exposure ("Solvent Induced Cumulative Insult Irritant Contact Dermatitis through Glove Permeation: A Case-Report on the Chronic Occupational Skin Lesion," 2023; Tanaka, 2022). Functionally, these components appear to restore the lipid matrix of the stratum corneum, reducing transepidermal water loss and thereby directly addressing the dryness and scaling that define impaired skin integrity in this population. The steady day-on-day decline in local skin temperature in Mrs. S offers an objective, if modest, physiological correlate of this anti-inflammatory effect, moving from a distinctly febrile-range local reading toward a value consistent with resting skin temperature.

These findings sit comfortably alongside earlier reports of VCO's benefit for impaired skin integrity in other populations: agricultural workers with occupational dermatitis, elderly residents in long-term care, preterm infants, hemodialysis-related pruritus, and postpartum perineal wound healing. What this study adds is not a new mechanism but a new context and a new delivery model: a coastal population with a distinct exposure profile, evaluated through a comparative two-participant quasi-experimental design rather than a single case, and delivered through an explicit, staged nursing process rather than treatment alone.



The two participants did not resolve at an identical pace, and that gap is itself informative rather than anomalous. Mrs. S continued her outdoor occupational duties throughout the three-day period, sustaining ongoing contact with seawater, dust, and wind even as VCO therapy was applied a persistent confounding exposure that Mrs. K, whose activities were largely indoor, did not share. This distinction plausibly explains why Mrs. S's improvement, while substantial, trailed slightly behind Mrs. K's in qualitative completeness, and it underscores a broader point for community nursing practice in coastal settings: topical therapy alone cannot fully compensate for continuous re-exposure, and intervention protocols may need to pair VCO application with occupational protective measures for outdoor workers specifically.

Read through Orem's framework, the clinical improvement documented above is only half the result. The other half is the deliberate, staged transfer of responsibility from nurse-performed care on Day 1, to supervised self-application on Day 2, to fully independent care on Day 3 that mirrors Orem's progression through wholly compensatory, partially compensatory, and supportive-educative nursing systems. This is not incidental scaffolding; it is the theoretical mechanism by which a three-day intervention becomes something more durable than a topical treatment course. By the final assessment, both participants were not simply symptom-free but demonstrably capable of managing a recurring environmental health risk using a resource available in their own kitchens, which is the practical definition of restored self-care agency in Orem's model.

This study carries several limitations that temper how far its findings can be extended. The comparative sample was restricted to two participants, which supports rich within-case and between-case description but does not permit statistical generalization to the broader coastal population; a randomized controlled trial with a larger sample is needed to establish population-level effect estimates. The observation period was limited to 72 hours, capturing acute, superficial improvement in the stratum corneum without any indication of whether these gains are sustained or whether dermatitis recurs once therapy stops, which longitudinal follow-up would need to address. Documentation was also not fully consistent between participants local skin temperature and lesion status were not recorded for Mrs. K on Day 3 introducing an asymmetry in the outcome data that future protocols should standardize with identical measurement points for every participant. Finally, environmental exposure could not be controlled: Mrs. S's continued outdoor occupational duties during the intervention period represent an uncontrolled confounding variable that may have moderated her rate of improvement relative to Mrs. K.

CONCLUSION

What ultimately resolved in these two participants was not only inflamed skin but a specific kind of dependency: the assumption that skin health in a hostile coastal environment required something beyond what people could provide for themselves. Standardized VCO therapy reduced pruritus, faded erythema, cooled local skin temperature, and restored skin texture in both a 60-year-old outdoor worker and a 35-year-old housewife within 72 hours, consistent with VCO's documented anti-inflammatory, antimicrobial, and moisturizing properties. Yet the more durable outcome sat beneath the clinical numbers: guided by Dorothea Orem's Self-Care Deficit Theory, the nursing process moved both participants from a wholly compensatory system, in which the nurse performed the intervention, through a partially compensatory phase, to a supportive-educative system in which each woman came to care for her own skin using a resource she could obtain and afford herself. That progression not the coconut oil alone is what makes this model worth replicating: a community nursing intervention that treats self-care agency as the actual endpoint, with restored skin integrity as its visible proof.





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Conflict of Interest

The authors declare that there is no conflict of interest in the research, authorship, or publication of this article.

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