

Family-Supported Personal Hygiene Education for Improving Dermatitis-Related Knowledge Among Agricultural Workers: A Case Study

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Abstract:

Dermatitis is a common occupational health concern among agricultural workers, who are frequently exposed to environmental irritants, pesticides, fertilizers, plants, and prolonged sunlight exposure. Inadequate knowledge and suboptimal personal hygiene practices may further increase the risk of persistent skin problems. This study aimed to describe the application of personal hygiene health education, combined with family-supported mentoring, to address a knowledge deficit in a farmer with dermatitis. A case study design was conducted in the working area of the Padang Community Health Center involving a 53-year-old sugarcane farm laborer and her family. The intervention was implemented over seven consecutive days. It consisted of four visits, two structured educational sessions focused on recognizing dermatitis and appropriate personal hygiene practices, and continuous family-supported mentoring. Knowledge was assessed using pre-intervention and post-intervention questionnaires, while relevant behavioral responses were documented throughout the intervention period. The participant demonstrated several misconceptions about dermatitis and suboptimal hygiene practices at baseline, including delayed bathing, inconsistent handwashing, and reusing field clothing. Following the intervention, the knowledge score increased from 72.5 to 90, indicating improved understanding of dermatitis and recommended personal hygiene practices. Family-supported educational mentoring was associated with improved knowledge and may represent a feasible nursing approach to strengthening self-management of dermatitis among agricultural workers. Larger studies using validated instruments, comparative designs, and longer follow-up periods are required to evaluate the effectiveness and sustainability of this intervention.

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INTRODUCTION

Dermatitis represents an important occupational health concern among agricultural workers because farming activities involve repeated exposure to environmental and chemical factors that may compromise skin integrity (Febriana et al., 2023). Farmers routinely work under conditions characterized by high temperatures, humidity, exposure to sunlight, contact with plants, soil, pesticides, fertilizers, and other potential irritants. Repeated occupational exposure to chemical and physical agents is recognized as a major contributor to contact dermatitis (Schütte et al., 2023). Pesticide exposure also remains an occupational health concern among agricultural workers, particularly when adequate protective measures are not consistently used (Febriana et al., 2023). Prolonged or repeated exposure to these factors may trigger inflammatory skin responses manifested by itching, dryness, erythema, burning sensations, edema, skin thickening, pain, or blister formation. Persistent symptoms can interfere with sleep, comfort, daily activities, and overall

quality of life. Agricultural workers may continue working despite these complaints because skin symptoms are often perceived as minor and do not require immediate professional attention. Effective prevention and management of dermatitis in agricultural communities consequently require interventions that address occupational exposure alongside appropriate self-care practices (Ahlström et al., 2022).

Personal hygiene constitutes an important preventive strategy for reducing prolonged skin contact with substances encountered during agricultural work (Yuantari et al., 2026). Practices such as washing hands after field activities, bathing promptly after occupational exposure, changing contaminated clothing, and maintaining clean work garments may help minimize continued dermal exposure to pesticide residues and other potential contaminants (Lari et al., 2022). Suboptimal hygiene practices remain a concern among farmers with limited knowledge of dermatitis and its relationship to occupational activities (Istriningsih et al., 2022). Some individuals may reuse clothing worn during agricultural activities, delay bathing after pesticide application, or inadequately manage contaminated work clothing (Adamu & Abebe, 2022). Such behaviors may prolong dermal contact with occupational contaminants, while poor personal hygiene practices have been associated with a greater likelihood of irritant contact dermatitis among agricultural workers (Yuantari et al., 2026).

Limited knowledge regarding dermatitis may influence how agricultural workers recognize symptoms, interpret possible causes, and respond to skin complaints (Loman et al., 2024). Health literacy is particularly important in skin disease because patients must understand their diagnosis, recognize relevant exposures, and appropriately apply preventive and self-management recommendations. Farmers who regard itching or redness as an ordinary consequence of fieldwork may be less likely to adopt preventive measures or seek appropriate care (Wongta et al., 2024). Research among farmers has demonstrated that knowledge and perception of occupational risks are closely related to safety behavior, with greater knowledge associated with safer agricultural practices. Misconceptions may also encourage the use of self-directed practices intended only to relieve discomfort rather than address potential exposure or improve skin protection. Educational background and access to understandable health information may further influence an individual's ability to recognize risk factors and apply recommended hygiene practices (Kangavari et al., 2024). A systematic review found that education, knowledge, risk perception, access to information, training, and extension services are important determinants of farmers' adoption of protective measures against occupational pesticide exposure. Knowledge deficits represent an important nursing problem because inadequate understanding can affect both preventive behavior and disease self-management (Loman et al., 2024).

Health education has become a widely used strategy for improving knowledge and supporting healthier behavior among individuals with preventable or manageable health problems (Shi et al., 2023). Systematic reviews indicate that therapeutic and patient education can improve disease knowledge, treatment adherence, self-management, and health-related behaviors across different clinical populations. Conventional education commonly focuses on providing information about disease recognition, risk factors, prevention, and appropriate self-care (Correia et al., 2023). Therapeutic patient education frequently incorporates understanding of disease processes, disease management, risk-factor modification, lifestyle change, and self-care skills. Educational effectiveness may be strengthened when information is adapted to participants' levels of understanding and reinforced through repeated interactions (Jagodage et al., 2024). Evidence from teach-back interventions supports repeated clarification tailored to individual health literacy needs, while longer-duration educational programs may yield greater improvements in knowledge and health behavior. Mentoring and health coaching extend the educational process by providing ongoing, person-centered guidance as participants apply new information in their daily routines

(Almulhim et al., 2023). Health coaching interventions commonly incorporate goal setting, problem solving, self-monitoring, social support, and individualized behavior-change strategies to facilitate self-management. Family participation may further reinforce this process by encouraging adherence to recommended self-care practices, addressing misconceptions, and supporting consistent implementation of preventive behaviors (Busebaia et al., 2023). Evidence synthesized across systematic reviews identifies family support as an important contributor to sustained self-care management within the home environment.

Current dermatitis education literature largely emphasizes patient and caregiver education delivered through group-based programs, individual consultations, printed materials, and digital resources. At the same time, evidence regarding structured educational mentoring remains heterogeneous and comparatively limited (Wilken et al., 2023). Existing studies have predominantly examined atopic dermatitis populations in clinical settings, with relatively little attention to short-term, family-supported educational mentoring specifically within agricultural households. Knowledge improvement alone may not be sufficient when self-management behaviors are shaped by established routines, treatment beliefs, environmental circumstances, and the practical demands of everyday life; nurse-led educational interventions increasingly incorporate individualized guidance and caregiver participation to strengthen disease-management capacity (Brunner et al., 2023). A structured approach that integrates disease education, practical self-care instruction, repeated reinforcement, and family participation may provide a more contextualized strategy for addressing these challenges, as multiday educational interventions involving patients and family members have demonstrated sustained improvements in knowledge of dermatitis (Andrade et al., 2023). The distinctive aspect of the present intervention is its combination of brief, structured education with continuous mentoring and direct family involvement, rather than relying solely on a single educational encounter.

Family-supported educational mentoring may be particularly relevant for farmers with dermatitis because health-related behaviors are frequently practiced and reinforced within the household environment (Kim et al., 2022). Evidence from home-based care research indicates that involving patients and family caregivers in educational and behavioral interventions can improve knowledge, practical self-care skills, and health-related behaviors (Huang et al., 2023). Repeated guidance can provide opportunities to clarify information, identify inappropriate hygiene practices, and encourage participants to apply recommended behaviors following agricultural exposure (Feng et al., 2023). Family members may support changes related to bathing, handwashing, clothing hygiene, symptom monitoring, and decisions to seek health services when complaints persist (Wheeler et al., 2022). Family-centered approaches align with nursing principles that recognize the family as an important participant in health management, self-care, and the implementation of health-related practices in everyday living environments (Chironda et al., 2023).

The present study aimed to describe the application of personal hygiene health education, combined with family-supported mentoring, for a farmer experiencing dermatitis and a knowledge deficit in the workplace at the Padang Community Health Center. The intervention was designed to improve understanding of dermatitis and appropriate personal hygiene practices through structured educational sessions and continued mentoring. Evaluation focused on changes in knowledge before and after the intervention while documenting relevant behavioral responses during the mentoring period. The study is important because a feasible, family-centered educational strategy may offer primary health-care nurses a practical approach to strengthening dermatitis prevention and self-management among agricultural workers, while also providing preliminary evidence to develop further and evaluate structured mentoring models in larger populations (Diriba et al., 2024).

STUDY DESIGN

Study setting and Timeline

The study was conducted in the catchment area of the Padang Community Health Center. Eligible participants were families of farmers or agricultural laborers with at least one family member experiencing dermatitis ranging from mild (<15) to moderate (15–40). Families were required to be cooperative and able to communicate effectively in Indonesian. The intervention was implemented from April 10 to 16, 2026, over seven days and comprised four home visits, two structured health education sessions, and continuous mentoring throughout the intervention period. Participants' knowledge was assessed using pre-intervention and post-intervention questionnaires to evaluate changes following the educational and mentoring intervention.

Data Collection Procedures

Data were collected through structured interviews assessing participants' duration of agricultural work, post-work personal hygiene practices, and baseline knowledge of dermatitis. Knowledge was evaluated using pre-intervention and post-intervention questionnaires administered during the study period. Changes in participants' knowledge and health-related behaviors following the educational intervention were systematically documented to assess the effects of the health education and mentoring program.

Ethical Considerations

Ethical principles were observed throughout the study. All participating family members provided informed consent prior to enrollment. Participant confidentiality and anonymity were maintained by using initials instead of identifiable personal information. All participant-related data were securely stored and were accessible only to the researcher to ensure data confidentiality and privacy. Ethical approval for the study was obtained from the Faculty of Nursing at the University of Jember.

CLINICAL FINDINGS

Clinical data were obtained through interviews and direct observation of Mr. S's family, with Mrs. L, a 53-year-old sugarcane farm laborer, identified as the family member experiencing dermatitis. The household was classified as a nuclear family with five adolescent children. Mrs. L reported recurrent itching affecting her hands and feet, particularly after returning from agricultural work. Her daily occupational activities involved approximately 5–6 hours of work in sugarcane fields, resulting in prolonged and repeated exposure to the agricultural environment.

Assessment of the family's knowledge and perceptions identified several misconceptions regarding dermatitis. The family attributed the itching and erythema primarily to scratching during fieldwork, which they believed subsequently caused wounds or abrasions. Personal hygiene practices were also suboptimal. Mrs. L reportedly reused field clothing on the following day when it was perceived to be clean, did not routinely bathe immediately after returning from the fields, and did not consistently wash her hands immediately after agricultural activities. Symptom management at home included applying powder mixed with water to the affected skin to provide a cooling sensation. These findings indicated gaps in the family's understanding of dermatitis and appropriate personal hygiene practices following occupational exposure.

Physical examination documented a blood pressure of 170/100 mmHg, a *compos mentis* level of consciousness, and itching as the primary complaint, with no additional symptoms. Baseline

knowledge assessment using the pre-test questionnaire yielded a score of 72.5, which was classified as sufficient knowledge according to the study's scoring criteria.

THERAPEUTIC INTERVENTION

Types of Therapeutic Intervention

The therapeutic intervention consisted of health education based on the Indonesian Nursing Intervention Standards, specifically Health Education (I.12383). Family members were directly involved in the intervention, providing support throughout the educational and mentoring process.

Administration of Therapeutic Intervention

The health education sessions focused on recognition of dermatitis and appropriate personal hygiene practices. Each educational session lasted approximately 15 minutes. Mentoring and follow-up support were documented over seven consecutive days to reinforce participants' understanding and encourage consistent application of the recommended personal hygiene practices.

RESULT

Knowledge assessment showed an increase following the seven-day health education and mentoring intervention. The participant's pre-intervention knowledge score was 72.5 on the first day, which was classified as sufficient according to the study criteria. The post-intervention assessment conducted on the seventh day yielded a score of 90, representing an increase of 17.5 points from baseline. This improvement indicated a higher level of knowledge regarding dermatitis and personal hygiene after completion of the intervention. The available data demonstrate an increase in knowledge scores between the pre-test and post-test assessments; however, the study did not report inferential statistical testing to establish statistical significance.

Table 1. Changes in Knowledge Scores Before and After the Intervention

Visiting day	Pre-Post Test Knowledge Score Results
First day	72.5
Seventh day	90

The pre-test and post-test results demonstrate a clear improvement in the participants' knowledge following the health education and mentoring program. The score increased from 72.5 at baseline to 90.0 after seven days of the intervention, suggesting that the educational program was associated with improved understanding of dermatitis and adherence to recommended personal hygiene practices.

RESULT

The present case study indicates that a short-term, family-supported health education and mentoring intervention was associated with improved knowledge regarding dermatitis and personal hygiene among a sugarcane farm laborer. The participant initially demonstrated misconceptions about the causes and management of dermatitis, including the belief that itching and erythema were primarily consequences of scratching during fieldwork rather than possible manifestations of occupational exposure. Personal hygiene practices were also suboptimal, as reflected in delayed bathing after fieldwork, inconsistent handwashing, reusing field clothing when it appeared clean, and

using powder mixed with water to relieve discomfort. The participant's knowledge score increased from 72.5 before the intervention to 90 after seven days of education and mentoring. This change suggests that context-specific education involving family members may improve understanding of dermatitis and support more appropriate disease-management practices (Sitthisan et al., 2024). However, the magnitude of the effect in the present study cannot be interpreted as statistically significant because the study involved a single case and did not apply inferential statistical testing.

The clinical findings are consistent with the broader understanding of occupational dermatitis among agricultural workers, in whom repeated contact with plants, soil, dust, moisture, sunlight, fertilizers, pesticides, and other irritants may compromise the skin barrier and contribute to inflammatory reactions (Akbar et al., 2025). The participant reported recurrent itching of the hands and feet after approximately 5–6 hours of work in sugarcane fields, suggesting a temporal relationship between agricultural exposure and symptom occurrence. Repeated exposure may increase cumulative irritation, particularly when work clothing remains in contact with the skin or cleansing is delayed (Karagounis & Cohen, 2023). Personal hygiene represents an important modifiable component of occupational skin protection. Timely bathing, handwashing, changing work clothes, and minimizing prolonged contact with occupational irritants can help maintain skin integrity and reduce potentially harmful exposures (Sedeh et al., 2023). The present findings support the view that dermatitis prevention in agricultural settings should address both occupational exposure and daily self-care behavior rather than focusing only on symptom relief (Akbar et al., 2025).

The participant's misconceptions also reflect findings in occupational-health research showing that workers' knowledge and risk perceptions can influence precautionary behavior when they are exposed to workplace health hazards. Evidence from Indonesian agricultural workers similarly indicates that gaps in knowledge and safety practices may coexist with substantial occupational exposure risks, including pesticide-related skin disease. Agricultural workers may perceive recurrent occupational symptoms as an expected consequence of their work, particularly when health risks become normalized in routine working conditions, thereby weakening precautionary responses. The participant in this study regarded itching as an expected consequence of fieldwork and used a home-based cooling practice rather than an evidence-informed skin-care strategy. This pattern is clinically relevant because symptom relief does not necessarily eliminate the underlying occupational exposure or prevent continued impairment of the skin barrier. Occupational skin-disease research has demonstrated that repeated workplace exposure to irritants and inadequate protective practices contribute to the development and persistence of work-related skin disorders. Health education that explains occupational hazards, early manifestations of skin disease, and appropriate preventive practices may therefore strengthen workers' capacity to recognize risks and adopt appropriate protective behaviors (Febriana et al., 2022; Yovi et al., 2023).

Educational background may also have influenced the participant's baseline understanding of dermatitis and the way health information was interpreted (Ryman et al., 2024). The participant had completed elementary-level education, which may have affected familiarity with medical terminology and comprehension of complex written health information. Health literacy research generally shows that educational interventions are more effective when information is adapted to learners' levels of understanding and presented in accessible formats that facilitate comprehension (Galmarini et al., 2024). Reinforcement through interactive educational strategies, including repeated explanation and teach-back, may further improve health literacy, knowledge, and health-related behaviors among individuals with limited health literacy (Cheng et al., 2023). The intervention in this study used brief educational sessions combined with seven days of mentoring, allowing information to be revisited rather than delivered as a single episode. This approach is relevant to community nursing because knowledge acquisition depends on comprehension, recall, perceived relevance, and opportunities

to apply information. Tailoring educational content to occupational routines is particularly important for farmers and farm laborers.

The increase in knowledge observed in this case is broadly consistent with prior health education research indicating that structured education can improve disease-related knowledge and support self-management (Lampthey et al., 2022). Structured self-management education has been associated with improved clinical and self-management outcomes, particularly when educational content is systematically delivered and adapted to the needs of the target population. Interventions that combine information delivery with follow-up support provide opportunities for clarification, reinforcement, and correction of misconceptions that one-time counseling may not offer (Chowdhury et al., 2024). Evidence from a systematic review and meta-analysis of 44 studies and 11,838 participants indicates that ongoing support, alongside individualized educational delivery, is favorable for improving disease self-management. The mentoring component contributed to the observed improvement because participants received information on dermatitis and personal hygiene and support during the period when recommended practices were expected to be implemented. Health coaching combined with follow-up has been shown to improve self-management skills and health literacy compared with usual health guidance, supporting the potential value of continued interpersonal guidance after initial education. Repeated contact may strengthen reinforcement by allowing participants to revisit key messages and relate them to daily experience (Qiao et al., 2024). The increase from 72.5 to 90 should therefore be interpreted as an educational outcome consistent with the intervention's intended mechanism, while recognizing that the design cannot disentangle the effects of education, mentoring, family support, and repeated testing.

Family participation represents an important feature of the intervention because personal hygiene and other self-management practices are embedded within household routines and social support systems (Mphasha et al., 2023). Evidence from family-based interventions indicates that family cohesion, support, and active involvement can influence health behaviors and patients' ability to maintain recommended self-management practices (Matrook et al., 2025). Family members may influence whether work clothing is changed and washed, whether bathing occurs promptly, whether symptoms are monitored, and whether professional care is sought when skin problems persist. Family-supported education may also help address inaccurate beliefs and strengthen understanding of dermatitis management, particularly when caregivers are actively included in disease-related education (Willard et al., 2026). The intervention used direct family involvement, creating an opportunity for dermatitis-related knowledge to extend beyond the individual participant. Family-centered approaches are relevant in community nursing because many recommended self-care activities are carried out in the home environment, where family dynamics can facilitate or impede their implementation. Community-based evidence further suggests that structured family-supported interventions can improve knowledge, self-efficacy, family functioning, and self-management behaviors (Zhu et al., 2025). Strengthening the family's ability to recognize symptoms, encourage preventive hygiene, and support appropriate care-seeking may therefore improve the sustainability of self-management practices.

The findings have practical implications for nursing practice and primary health care in agricultural communities. Brief educational interventions integrated into community or occupational health services may be a feasible strategy to address preventable knowledge gaps and strengthen skin-protective behaviors among workers at risk of occupational dermatitis (Parsons et al., 2022). Educational content should emphasize recognition of early signs of dermatitis, identification and reduction of occupational exposures, appropriate skin hygiene, use of appropriate skin-protection measures, and indications for professional assessment. Mentoring and continued educational support may be particularly useful when recommended behaviors require modification of established

routines, because sustained implementation of skin-protective behavior can be challenging after an initial educational intervention (Ristow et al., 2022). Primary health-care nurses may also involve family members as partners in reinforcing preventive practices. Screening for occupational exposure, early skin symptoms, and relevant protective behaviors during routine community assessments could help identify individuals requiring targeted education before dermatitis becomes persistent or more severe (Bauer et al., 2023).

Several methodological limitations should be considered when interpreting these findings. The single-case design involving one participant and one family substantially limits generalizability to other farmers, agricultural settings, or populations with different types and severities of dermatitis. Case-study methodology provides detailed contextual evidence but has recognized limitations regarding statistical generalizability and methodological rigor, particularly when findings arise from a highly specific clinical context (Tobita, 2025). The absence of a control or comparison condition prevents robust attribution of the observed increase in knowledge exclusively to the intervention, as stronger single-case intervention designs require systematic comparison between baseline and intervention conditions to support causal inference. Repeated exposure to similar assessment items may also have contributed to the higher post-test score through a testing effect, as repeated retrieval or testing can itself improve subsequent performance (Polack & Miller, 2022). The manuscript does not report the psychometric properties of the knowledge questionnaire, detailed scoring procedures, or the threshold used to categorize knowledge levels, thereby limiting the assessment of measurement validity and reproducibility. Current measurement standards emphasize transparent reporting of instrument validity, reliability, measurement error, responsiveness, scoring, and the appropriateness of repeated measurements (Gagnier et al., 2025). Behavioral changes were described but not quantified with a validated measure, so claims regarding behavior modification should be approached with caution. The seven-day follow-up period was too short to determine whether knowledge and hygiene practices were sustained. Clinical improvement in dermatitis severity was not reported, preventing the determination of whether increased knowledge translated into measurable improvement in skin condition. Future studies would benefit from larger sample sizes, validated instruments, longer follow-up periods, standardized assessments of dermatitis severity and hygiene behaviors, and comparative or rigorous single-case experimental designs to estimate intervention effects more robustly (Kratochwill et al., 2026).

CONCLUSION

Personal hygiene education, combined with family-supported mentoring, was associated with improved knowledge of dermatitis and appropriate hygiene practices among participants. The intervention provided structured education, repeated reinforcement, and family involvement, which may support better understanding and adoption of recommended self-care practices. Family-centered educational mentoring may represent a feasible approach for addressing knowledge deficits related to dermatitis in agricultural communities. Further research involving larger populations, standardized outcome measures, and longer follow-up periods is needed to determine the effectiveness, sustainability, and broader applicability of this intervention.

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