

Original Research Article

Association Between Personal Hygiene and Scabies Related Symptoms Among Male Students in an Islamic Boarding School: A Cross-Sectional Study

Supriyanto^{1*}, Ivan Rachmawan², Yulia Maharani³

¹ Diploma III Nursing Study Program, Universitas Dr. Soekardjo, Banyuwangi, Indonesia

^{2,3} Bachelor of Nursing Study Program, Universitas Dr. Soekardjo, Banyuwangi, Indonesia

***Corresponding Author: Supriyanto**

Email: ners.supriyanto@gmail.com

ABSTRACT

Background: Scabies is a contagious skin disease caused by *Sarcoptes scabiei* var. *hominis* and remains a common problem in densely populated communal settings, including Islamic boarding schools. Poor personal hygiene may facilitate transmission through direct skin contact and contaminated personal items.

Purpose: This study aimed to analyze the relationship between personal hygiene and scabies related symptoms among male students at Al-Anwari Kertosari Islamic Boarding School, Banyuwangi.

Methods: This quantitative correlational study used a cross-sectional design. The population comprised 144 male students, and 30 respondents were selected using accidental sampling based on eligibility and willingness to participate. Data were collected using structured questionnaires measuring personal hygiene and scabies symptoms. The personal hygiene questionnaire contained 34 yes/no items, while the scabies questionnaire contained 8 yes/no items. Data were analyzed using univariate statistics and Spearman rank correlation with a significance level of 0.05.

Results: Most respondents were categorized as having poor personal hygiene (83.3%). Based on questionnaire responses, 60.0% were classified as having symptoms suggestive of scabies; no clinical examination was performed to confirm the diagnosis. Spearman's rank correlation showed a statistically significant association between personal hygiene and questionnaire-based scabies symptom classification ($r_s=0.365$, 95% CI [0.01, 0.64], $p=0.047$).

Conclusion: Personal hygiene was significantly associated with scabies-related symptom status among the participating male students, although the magnitude of the association was weak to moderate. Hygiene education, early symptom reporting, and referral for clinical assessment may support scabies prevention in the boarding-school setting.

Keywords: Personal hygiene; Scabies; Students; Boarding school; Communal health

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INTRODUCTION

Scabies is a contagious parasitic skin infestation caused by *Sarcoptes scabiei* var. *hominis*. Transmission occurs mainly through prolonged direct skin-to-skin contact, although indirect transmission through contaminated clothing, towels, or bedding may also occur, particularly in crowded residential settings. Common manifestations include nocturnal pruritus, papules,

excoriations, and skin lesions that may interfere with sleep, comfort, concentration, school participation, and daily activities (Savira, 2020; Widaty et al., 2022; Widasmar, 2020; World Health Organization [WHO], 2023). Secondary bacterial infection may also develop when repeated scratching damages the skin barrier (Adiwinoto et al., 2023; WHO, 2023).

Scabies remains an important public health concern, particularly in densely populated and resource-limited settings. The WHO estimates that at least 200 million people worldwide are affected at any one time (WHO, 2023). Studies conducted in Indonesian Islamic boarding schools have reported varying proportions. A questionnaire-based study in Jambi reported scabies-related symptoms in 60.7% of students, whereas studies involving clinical assessment reported prevalence estimates of approximately 16.1% in Surakarta, 36.8% in Medan, and 43.8% in an urban traditional Islamic boarding school (Fauzah & Suparmi, 2023; Mawardi et al., 2024; Wahdini et al., 2025; Yulfi et al., 2022). These differences may partly reflect variations in participant characteristics, institutional settings, sampling methods, and assessment procedures.

Islamic boarding schools may be particularly vulnerable to scabies transmission because students live, study, worship, and sleep in shared environments. Close interpersonal contact, shared personal belongings, crowded sleeping arrangements, and inconsistent hygiene practices may facilitate transmission. Previous Indonesian studies have reported associations between personal hygiene, bedding and clothing practices, environmental sanitation, and scabies-related outcomes among boarding-school students (Fitriani et al., 2021; Marga, 2020; Rahmawati et al., 2023; Sulistiarini et al., 2022; Tilofa et al., 2022).

Scabies prevention in boarding schools may also be influenced by factors beyond personal hygiene. Studies have highlighted the relevance of knowledge about scabies, clean and healthy living behavior, contact with affected individuals, sharing of personal belongings, and environmental sanitation (Damayanti et al., 2021; Dhuha & Setyoningrum, 2023; Hernanda & Kesetyaningsih, 2024; Isramilda et al., 2023; Nasution & Asyary, 2023; Septalita et al., 2024). Gender-related and institutional differences have also been examined in boarding-school settings, indicating that prevention strategies may need to be adapted to the characteristics and management practices of each institution (Tajudin et al., 2023).

A preliminary assessment conducted on 2 May 2024 at Al-Anwari Kertosari Islamic Boarding School involved interviews with ten students. Several students reported previous skin complaints and practices such as exchanging clothes, repeatedly wearing the same clothing, and rarely drying towels in direct sunlight. These preliminary observations were not intended as clinical assessments but indicated a need to examine hygiene practices and scabies-related symptoms among students in this boarding-school setting.

Although previous studies have reported associations between personal hygiene and scabies among Islamic boarding-school students, variations in student characteristics, residential arrangements, supervision, hygiene practices, and dormitory management may influence the magnitude of these associations across institutions (Fitriani et al., 2021; Nasution & Asyary, 2023; Rahmawati et al., 2023). Evidence specifically concerning male students at Al-Anwari Kertosari Islamic Boarding School remains limited. Therefore, this study aimed to examine the association between personal hygiene and scabies-related symptoms among male students at Al-Anwari Kertosari Islamic Boarding School, Banyuwangi, Indonesia.

METHODS

Study Design

This study was an analytical observational study using a cross-sectional design. Personal hygiene as the independent variable and questionnaire-based symptoms suggestive of scabies as the dependent variable were measured at the same time to examine the association between the two variables.

Setting

The study was conducted at Al-Anwari Kertosari Islamic Boarding School, Banyuwangi Regency, East Java, Indonesia. Data collection was carried out on 26 October 2024. The boarding school had 144 male students distributed across grade 7, grade 8, and grade 9 dormitory groups.

Research Subject

The study population comprised 144 male students residing at Al-Anwari Kertosari Islamic Boarding School. Thirty participants were recruited using accidental sampling from eligible students who were available during the data-collection period and agreed to participate. The inclusion criteria were active male students residing in the boarding school, able to complete the questionnaire, and willing to participate. Students who declined participation or returned incomplete questionnaires were excluded. No formal a priori sample-size calculation was documented in the approved study protocol; therefore, the sample was treated as exploratory, and the precision and generalizability of the estimates were interpreted accordingly.

Instruments

Data were collected using two structured questionnaires developed for the thesis. The personal hygiene questionnaire consisted of 34 dichotomous items covering skin, hand and nail, towel, clothing, bed and sheet, and water-related hygiene. Appropriate hygiene practices were scored 1, whereas inappropriate practices were scored 0. Total scores of 17–34 were categorized as good personal hygiene, and scores of 0–16 as poor personal hygiene. Testing in 25 students produced item-total correlations of 0.431–0.893 and a Cronbach's alpha of 0.968.

Scabies-related symptoms were assessed using an eight-item dichotomous questionnaire covering skin complaints, nocturnal itching and redness, itching in skin folds and interdigital areas, vesicular lesions, and skin injury following scratching. "Yes" responses were scored 1 and "no" responses were scored 0. Scores of 5–8 were categorized as suggestive of scabies, whereas scores of 0–4 were categorized as not suggestive. Testing in 25 students produced item-total correlations of 0.427–0.755 and a Cronbach's alpha of 0.747. The instrument assessed symptom status and was not intended to establish a clinical diagnosis.

Data Analysis

Data were analyzed using descriptive and bivariate statistics. Respondent characteristics, personal hygiene categories, and questionnaire-based symptoms suggestive of scabies were summarized using frequencies and percentages. Both study variables were analyzed as dichotomous ordinal categories; therefore, a normality test was not applicable to the primary categorical analysis. Spearman's rank correlation was used to examine the association between personal hygiene and questionnaire-based symptoms suggestive of scabies. The analysis was performed using IBM SPSS Statistics version 23, with a two-sided significance level of 0.05. A p-value below 0.05 was considered statistically significant.

Ethical Consideration

This research obtained ethical approval from the Health Research Ethics Committee of STIKES Banyuwangi with approval number 015/01/KEPK-STIKESBWI/X/2024, issued on 18 October 2024. Before data collection, permission was obtained from the boarding school. Respondents were informed about the study purpose, procedures, confidentiality of data, voluntary participation, and their right to withdraw. The study applied the ethical principles of justice, informed consent, anonymity, confidentiality, and non-maleficence.

RESULTS

Thirty male students participated in the study. Their ages ranged from 11 to 14 years, with most respondents aged 13 years. More than half were in grade 7 (Table 1).

Table 1. Characteristics of respondents

Characteristic	Frequency (n)	Percentage (%)
Age		
11 years	1	3.3
12 years	8	26.7
13 years	20	66.7
14 years	1	3.3
Grade		
Grade 7	17	56.7
Grade 8	8	26.7
Grade 9	5	16.7

Twenty-five respondents (83.3%) were categorized as having poor personal hygiene. Based on the questionnaire classification, 18 respondents (60.0%) had scores suggestive of scabies-related symptoms (Table 2).

Table 2. Distribution of personal hygiene and scabies-related symptom status

Variable category	Frequency (n)	Percentage (%)
Personal hygiene		
Good	5	16.7
Poor	25	83.3
Self-reported symptoms		
Suggestive	18	60.0
Not suggestive	12	40.0

Spearman's rank correlation showed a statistically significant association between personal hygiene and scabies-related symptom status ($r_s=0.365$, approximate 95% CI [0.01, 0.64], $p=0.047$). The coefficient indicated a weak-to-moderate association (Table 3).

Table 3. Association between personal hygiene and scabies-related symptom status

Variable relationship	n	Spearman's r_s	Approximate 95% CI	p-value
Personal hygiene and scabies-related symptom status	30	0.365	0.01–0.64	0.047

DISCUSSION

This study found that 83.3% of respondents were categorized as having poor personal hygiene. This proportion was higher than the 66.3% reported among students in an Islamic boarding school in Jambi (Fauzah & Suparmi, 2023). Differences in hygiene practices across boarding schools may reflect variations in access to personal supplies, laundering and drying facilities, dormitory routines, supervision, and the sharing of clothing, towels, or bedding. Previous Indonesian studies have similarly reported associations between personal hygiene practices and scabies among boarding-school students (Fitriani et al., 2021; Marga, 2020; Rahmawati et al., 2023; Sulistiarini et al., 2022; Tilofa et al., 2022).

Scabies-related symptom scores were categorized as suggestive in 60.0% of respondents. This proportion was close to the 60.7% reported in a questionnaire-based study in Jambi (Fauzah & Suparmi, 2023). In contrast, studies incorporating physical examination reported prevalence estimates of 16.1% in Surakarta, 36.8% in Medan, and 43.8% in an urban traditional Islamic boarding school (Mawardi et al., 2024; Wahdini et al., 2025; Yulfi et al., 2022). These differences should be interpreted in relation to assessment procedures, sampling methods, participant characteristics, and institutional contexts rather than as direct evidence that one boarding school has a greater disease burden than another.

The analysis identified a statistically significant association between personal hygiene and scabies-related symptom status. However, the correlation coefficient of 0.365 indicated only a weak-to-moderate association, and the relatively wide confidence interval showed limited precision. Personal hygiene should therefore be considered one of several possible factors associated with scabies-related symptoms rather than the primary determinant. Previous studies have identified additional factors, including knowledge, clean and healthy living behavior, contact history, sharing personal belongings, bedding cleanliness, age, sex, and residential conditions (Damayanti et al., 2021; Dhuha & Setyoningrum, 2023; Fauzah & Suparmi, 2023; Mawardi et al., 2024; Nasution & Asyary, 2023; Septalita et al., 2024; Wahdini et al., 2025). Clinical research in Surakarta found that age, sex, itching history, and sharing belongings were associated with scabies, whereas a recent urban boarding-school study identified bedding cleanliness as an important factor associated with clinical scabies (Mawardi et al., 2024; Wahdini et al., 2025).

Most respondents were 13 years old and in grade 7. These characteristics describe the study sample but were not analyzed as factors associated with hygiene or symptom status. Therefore, the present study cannot determine whether developmental stage, adaptation to boarding-school life, or peer influence explains the predominance of poor hygiene. Although knowledge and clean and healthy living behavior have been associated with scabies-related outcomes in previous boarding-school studies, these factors were not measured in the present study (Damayanti et al., 2021; Dhuha & Setyoningrum, 2023).

Lighting and ventilation were not objectively measured or statistically analyzed as explanatory variables. Consequently, no conclusion can be made regarding their association with symptom status in this study. Environmental conditions remain relevant contextual factors because previous research has reported associations involving sanitation, crowding, contact patterns, shared belongings, and residential conditions (Rahmawati et al., 2023; Sulistiarini et al., 2022; Yulfi et al., 2022). However, these external findings should not be interpreted as findings of the present study.

The findings have practical implications for nursing and boarding-school health services. Health education may focus on the use of personal towels and clothing, regular cleaning of bedding, early reporting of persistent nocturnal itching, and referral for clinical assessment. Nurses and local health personnel may also support boarding-school managers in developing feasible screening, referral, and hygiene-monitoring procedures. These measures may contribute to reducing transmission when combined with appropriate treatment of affected individuals and management of close contacts (Widaty et al., 2022).

This study should be interpreted in light of several methodological considerations. The relatively small sample and accidental sampling technique may limit representativeness beyond the participating male students. Scabies-related symptom status was determined using a questionnaire rather than clinical examination. In addition, the cross-sectional design does not establish temporal sequence or causality. Nevertheless, the findings provide preliminary local evidence and may inform larger studies using more representative sampling, standardized clinical assessment, and measurement of additional behavioral and environmental factors.

CONCLUSION

Among male students participating in this study at Al-Anwari Kertosari Islamic Boarding School, most were categorized as having poor personal hygiene, and 60.0% had questionnaire scores suggestive of scabies-related symptoms. Personal hygiene was significantly associated with symptom status, although the magnitude of the association was weak to moderate. The findings are specific to the participating students and do not establish causality. Hygiene education, early symptom reporting, and referral for clinical assessment may

contribute to scabies prevention in the boarding-school setting. Further studies with larger samples and clinical assessment are needed to confirm these findings.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

AUTHOR CONTRIBUTION

S contributed to conceptualization, manuscript drafting, and critical review. IR contributed to supervision, methodology review, and scientific validation. YM contributed to data collection, data tabulation, analysis, and initial manuscript preparation. All authors approved the final manuscript.

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