

Factors Affecting the Incidence of Scabies Among Female Students at Nurul Huda Boarding School

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ABSTRACT

Background: Scabies is a persistent public health problem in densely populated educational institutions such as Islamic Boarding Schools. Motivated by the high vulnerability in Mempawah Regency, this study aimed to identify personal hygiene and environmental sanitation factors associated with scabies incidence among female students at the Nurul Huda Islamic Boarding School to support effective prevention strategies.

Methods: A quantitative observational study employing a cross-sectional design was conducted in October 2025, involving 69 female students selected through total sampling. Primary data were collected using structured questionnaires on personal hygiene, as well as direct physical observation checklists to assess dormitory environmental parameters. Data were analyzed using univariate and bivariate Chi-Square test ($p = 0.05$).

Results: Scabies prevalence among respondents was high, reaching 76.8%. Physical environmental parameters (occupancy density, humidity, and lighting) collectively failed to meet national health standards (100%). Bivariate analysis revealed that towel hygiene ($p = 0.008$) and clothing hygiene ($p = 0.002$) were statistically significant risk factors. Conversely, Knowledge level ($p = 0.364$), bathing habits ($p = 0.675$), and bedding habits ($p = 0.096$) showed no significant association, driven by a floor effect resulting from the overall unhealthful communal environment.

Conclusion: High scabies prevalence is directly associated with unhygienic towel and clothing management, exacerbated by substandard dormitory physical sanitation environmental improvements (enhancing ventilation and natural lighting) with strict enforcement of personal hygiene compliance, such as ironing clothes at high temperatures and prohibiting item sharing.

INTRODUCTION

Scabies is a contagious skin disease caused by infestation and sensitization to the *Sarcoptes Scabiei* Var. *Hominis* mite (Nurdin, 2024). This disease is characterized by clinical symptoms of severe itching (nocturnal pruritus) that peaks at night, as well as lesions on thin skinned areas such as between the fingers, on the wrists, and in the genital area (Fitriani, 2021). Scabies is transmitted through direct skin to skin contact or indirect contact via the use of shared items such as contaminated clothing, towels, and religious artifacts (Azzahra, 2025; Nurhidayat, 2022). In terms of risk factors, the emergence of this disease is heavily influenced by low levels of knowledge, poor personal hygiene practices, and environmental sanitation conditions that do not meet health standards (Harahap, 2025; Rasyid et al., 2024).

Globally, scabies remains a public health issue, with 200 million cases worldwide (Nasution & Asyary, 2022). Scabies is one of the 12 most common skin diseases in Indonesia, with varying prevalence rates (Fitriani, 2021). In West Kalimantan, a study conducted at the Nurul Huda Islamic Boarding School in

Mempawah Regency showed that most female students had good knowledge about scabies, but only about half practiced effective preventive behaviors, with risky practices such as sharing beds and clothing still common (Karisma, 2025). Meanwhile, data from the Mempawah Regency Department of Agriculture, Food Security, and Fisheries indicate that there were 246 cases of scabies in the region from March 2017 to May 2020. The highest number of cases 114 was recorded in 2020 (Hidayah et al., 2021). Since Mempawah is a region vulnerable to transmission, this situation underscores the need for comprehensive public health interventions.

Due to high levels of social interaction and the use of shared facilities, the environment in Islamic boarding schools is frequently a major risk factor for the spread of scabies (Sulistiarini et al., 2022). Mite survival is facilitated by high room humidity, poor ventilation, and high occupancy density in dormitories (Fetriyah et al., 2024; Indriani et al., 2021). Additionally, the practice of boarding school students exchanging clothes or towels on a regular basis and their ignorance of the importance of regularly changing bed linens and airing out mattresses contribute to the spread of this illness in the boarding school setting (Aulia, 2022; Rahayu, 2025).

The majority of students experienced itching, humiliation, and difficulty focusing on their academics, and the DLQI (*Dermatology Life Quality Index*) scores of students with scabies were considerably higher than those without scabies, according to this study (Salsabila, 2024). Inconsistent treatment and a lack of management support from the boarding school in enhancing basic sanitation are common causes of failure to break the chain of transmission (Rahayu, 2025).

Given these problems, a thorough examination of the variables affecting the prevalence of scabies is required in order to develop successful preventative measures through enhanced environmental cleanliness and better personal hygiene in Islamic boarding schools. In order to lower prevalence rates and enhance the health of children attending Islamic boarding schools, this study attempts to uncover several factors linked to the incidence of scabies.

METHODS

Designs and Samples

This is a quantitative observational cross-sectional study that aims to simultaneously analyze the relationships between the independent variables (level of knowledge, bathing habits, towel hygiene, clothing hygiene, bedding hygiene, and the physical environment of the dormitory) and the dependent variable (incidence of scabies). This study was conducted at the Nurul Huda Islamic Boarding School, located in Sengkubang Village, Mempawah Hilir Subdistrict, Mempawah Regency, West Kalimantan Province, Indonesia, in October 2025. The study population consisted of all female students residing in the dormitory. Sampling was conducted using the total sampling technique, resulting in a total sample size of 69 female students.

Research Instruments and Data Collection

Primary data were collected directly using structured questionnaires and physical environment observation checklists. The questionnaire was designed to collect data on respondents demographics, knowledge regarding the transmission and prevention of scabies, personal hygiene practices (such as bathing habits, towel hygiene, clothing hygiene, and bedding hygiene), and clinical history of scabies symptoms (characterized by nighttime itching, or nocturnal pruritus, and characteristic skin lesions within the past six months). Furthermore, direct physical observations and measurements were conducted on-site at the dormitory to evaluate room temperature, humidity, natural lighting, and room occupancy density based on national environmental health standards.

Data Analysis

The collected data were processed and analyzed using statistical analysis software through two sequential stages: univariate analysis and bivariate analysis. univariate analysis was conducted to describe the frequency distribution and percentages of each variable under study. Bivariate analysis was performed using the chi-square test (including Pearson's chi-square test and Fisher's Exact test when necessary) at a 95% confidence level ($p=0.05$) to determine the statistical significance of the association between personal hygiene risk factors and incidence of scabies. In addition, the Odds Ratio (OR) with a

95% confidence interval (CI) was calculated to assess the magnitude of risk associated with each hygiene behavior that did not meet health standards.

Research Process

This research was conducted following a structured chronological workflow:

1. Preparation and Permitting: Conducting a preliminary survey, developing research instruments, and obtaining administrative and ethical approval from the management of the Nurul Huda Islamic Boarding School.
2. Outreach and Recruitment: Providing an explanation to the dormitory administrators and female students regarding the objectives, procedures, and benefits of this research.
3. Data Collection: Structured questionnaires were distributed to 69 respondents in a supervised setting to ensure data completeness and clarity, while objective physical measurements were taken in dormitory rooms (humidity, Lighting, temperature, and occupancy density).
4. Data Processing: Verifying, coding, entering, and cleaning raw data obtained from questionnaires and environmental observation sheets.
5. Interpretations and Reporting: Performing statistical analyses, interpreting univariate and bivariate results, and formulating public health recommendations.

Ethical Considerations

This study strictly adheres to the fundamental principles of research ethics involving human subjects. Official administrative and ethical research approvals were granted by the authorities at the Nurul Huda Islamic Boarding School before data collection began. All respondents (and boarding school guardians acting as surrogate parents or in loco parentis) received comprehensive information regarding the study's objectives, risks, and benefits. Written informed consent was obtained from all participants before data collections began. Participation was entirely voluntary, and respondents had the right to withdraw from the study at any time without any adverse consequences. To ensure confidentiality and privacy, all collected data was anonymized using unique identification numbers in place of personal names, and the information was used solely for academic and scientific research purposes.

RESULTS

Table 1. Respondent Characteristics

Variable	Category	N	%
Age	7-12 Years	16	23.2
	13-15 Years	30	43.5
	16-19 Years	23	33.3
Education	Elementary School	9	13
	Junior High School	31	44.9
	High School	29	42
Length of Stay	3-12 Months	12	17.4
	1-3 Years	23	33.3
	4-10 Years	34	49.3

Based on table 1, it can be seen that the majority of female students fall within the 13 – 15 age group, comprising 30 respondents (43.5%), and the highest level of education is junior high school, with 31 respondents (44.9%). Regarding the length of stay at the islamic boarding school, most female students have been there for 4 – 10 years 34 respondents (49.3%) Meanwhile, 23 female students have been there for 1- 3 years, and 12 female students (17.4%) have only been there for 3- 12 months.

Table 2. Univariate Analysis

Univariate analysis was used to describe the characteristics of each variable studied, including knowledge, behavior, and the incidence of scabies among female students at the Nurul Huda Islamic Boarding School.

Variable	Category	N	%
Knowledge	Good	49	71
	Not Good	20	29
Bathing Habits	Eligible	29	42
	Not Eligible	40	58
Towel Cleanliness	Eligible	36	52.2
	Not Eligible	33	47.8
Cleanliness of Clothing	Eligible	11	15.9
	Not Eligible	58	84.1
Bedding Hygiene	Eligible	15	21.7
	Not Eligible	54	78.3
Temperature	Meets Standard	69	100
Humidity	Not Within Standards	69	100
Lighting	Does Not Meet Standards	69	100
	Does Not Meet Standards	69	100
Housing Density	Does Not Meet Standards	69	100
	Does Not Meet Standards	69	100
Incidence of Scabies	Experienced	53	76.8
	Did Not Experience	16	23.2

Based on Table 2, univariate analysis shows that 53 of the surveyed individuals (76.8%) reported having experienced scabies. This figure includes all female boarding school students who exhibited symptoms of scabies within the past six months. From an epidemiological perspective, female boarding school student's who experienced itching in the past few months were classified as having a history of or currently experiencing scabies due to the risk of recurrence and the presence of mites in the dormitory. Based on behavioural factors, the highest proportion of non-compliant conditions was found in clothing hygiene (84.1%) and bedding hygiene (78.3%). On the other hand, all dormitory environmental parameters, including lighting, humidity, and occupancy density, fell into the "does not meet health standards" category (100%).

Table 4. Bivariate Analysis

Variable	P-value	Odds Ratio (95%CI)
Knowledge	0.364	2.046 (0.514-8.146)
Bathing Habits	0.675	0.783 (0.248-2.468)
Towel Hygiene	0.008	5.652 (1.439-22.196)
Clothing Cleanliness	0.002	9.528 (2.305-39.389)
Bedding Cleanliness	0.096	2.933 (0.849-10.140)

Based on Table 3, bivariate analysis showed that towel cleanliness ($p = 0.008$) and clothing cleanliness ($p = 0.002$) were significantly associated with the incidence of scabies among female boarding school students ($p < 0.05$). Most respondents had poor clothing hygiene (84.1%) and substandard towel hygiene (47.8%), which significantly contributed to the high prevalence of scabies. Conversely, knowledge levels ($p = 0.364$), bathing habits ($p = 0.675$), and bedding hygiene ($p = 0.096$) did not show a statistically significant association with scabies incidence ($p > 0.05$). Although the majority of respondents had a good level of knowledge (71%), this did not significantly translate into a reduction in disease transmission. Overall, these findings suggest that scabies transmission in dormitory settings is primarily driven by personal hygiene practices directly related to clothing and towels, rather than by general knowledge or bathing habits.

DISCUSSION

Relationship Between Knowledge Level and Scabies Incidence

The number of scabies cases among female boarding school students does not significantly correlate with knowledge level, according to statistical test results ($p=0.364$). This result is in line with other research showing that students' understanding of how to avoid the illness does not usually differ noticeably (Fitri Rahmadini, A., Kusmiati, 2022). However, this finding contradicts some other literature indicating a significant relationship between students' knowledge levels and the incidence of scabies (Permata, 2024).

The absence of a significant association between adequate knowledge of scabies and optimal preventive measures does not necessarily imply that high levels of knowledge always lead to good health behaviors. If hindered by a lack of facilities and poor environmental sanitation, high levels of knowledge do not always result in good health behaviors (Ramadhan, 2025). In the boarding school environment, although understanding of scabies prevention is very good, preventive measures are often hindered by external factors, such as high dormitory occupancy, indoor humidity levels, and the shared use of clothing-practices that are difficult to avoid (Aqilah, 2025; Azzahra, 2025). These findings align with the notion that increasing knowledge through structured education can be cognitively successful; however, such success does not automatically guarantee behavioral change if environmental factors are not also addressed. This is evident in the evaluation of a healthy lifestyle education program, which successfully improved students' understanding but still emphasized the need for the ongoing role of teachers and the school environment to ensure the sustainability of these behaviors (Harahap, 2025).

The Relationship Between Bathing Habits and the Incidence of Scabies

The statistical tests yielded a p-value of 0.675 ($p > 0.05$). These findings show that the incidence of scabies at the Nurul Huda Islamic Boarding School is not significantly correlated with the respondents' bathing practices. The bathing practices of the female students in this study did not directly affect the rate of scabies transmission among them.

According to univariate data, all female students practiced showering with soap and cleaning their bodies while scrubbing. This result shows that each respondent's basic awareness and personal hygiene practices during bathing have improved. Some preferences including hot bath, long bath and also using high quality body wash to prevent from scabies and other skin issues as well.

This is in line with studies by Kurniawan And Mustikasari (2021), which claims that when the agent (*Sarcoptes scabiei*) has widely contaminated communal surroundings, independent bathing behaviors and frequency are not primary markers of scabies epidemics. Additionally, personal hygiene treatments connected to bathing frequently result in a "floor effect" in densely crowded institutional settings, according to research by Ramadhan (2025), the Nurul Huda Islamic Boarding School clearly demonstrates this floor impact. Humidity, illumination, and occupancy density were all 100% in categories that do not satisfy health standards, according to a univariate analysis of the dorm environment. For *Sarcoptes Scabiei* mites to live outside of their hosts (people), a cramped, humid, and sunless dorm room is the perfect microhabitat. Therefore, when the mites are active in rooms with inadequate public sanitation, they will instantly re-expose the students, regardless of how hygienic their bathing habits are.

The Relationship Between Towel Cleanliness and the Incidence of Scabies

The results of the Pearson Chi-Square statistical test showed a p-value of 0.008 ($P < 0.05$), indicating a highly statistically significant relationship between towel hygiene levels and the number of scabies cases among female boarding school students. Female students who did not properly manage their towels had a 1.42 times greater risk of contracting scabies compared to those who managed their towels properly.

Although the majority of female students are aware of the dangers of wet towels (88.4%) and drying them in the sun (87%) there are still 27.5% of female boarding school students who engage in risky behaviors, such as sharing towels or using them in rotation. The ideal incubation medium for *Sarcoptes scabiei var hominis* mites to survive outside the human body is a damp towel.

This research is supported by a previous study by (Nurhidayat, 2022), which found that the life cycle of mites in Islamic boarding schools is primarily influenced by indirect transmission through the shared use of contaminated prayer items and towels. The chain of transmission will continue to spread as long as the shared use of towels persists.

The Relationship Between Clothing Hygiene and the Incidence of Scabies

The results of the Pearson Chi-Square statistical test showed a p-value of 0.002 ($p < 0.05$), indicating a statistically significant association between clothing hygiene and the incidence of scabies among female students at the Nurul Huda Islamic Boarding School. According to field data, the majority of female students (84.1%) do not iron their clothes regularly. There is also a culture of borrowing or exchanging clothes among female students due to a lack of drying space and the high intensity of boarding school activities. Theoretically, clothing can serve as a medium for indirect transmission of the *Sarcoptes scabiei* var *hominis* mite. Mites and their eggs, when enclosed in fabric, can survive for 24 to 36 hours at room temperature. When clothing is not ironed, the mites are not exposed to temperatures high enough to halt their life cycle.

The findings of this study are supported by a field study by [Mujiyanti and Marwiyah \(2024\)](#), which reinforce these results by stating that clothing hygiene is one of the main factors contributing to the spread of scabies in crowded dormitory environments. A study shows that ironing clothes at high temperatures can damage the mites' protective system and kill their eggs. Conversely, the humid conditions favoured by the parasites are exacerbated by hanging clothes in a room while they are still damp or washing clothes without thoroughly drying them. Consequently, low compliance with ironing and the high frequency of borrowing and lending clothes are the main causes of scabies transmission among female students at the Nurul Huda Islamic Boarding School.

The Relationship Between Bedding Hygiene and the Incidence of Scabies

The results of the analysis using Fisher's Exact Test yielded a p-value of 0.096 ($p > 0.05$), indicating no statistically significant relationship between bedding hygiene and the incidence of scabies among female students. However, descriptive data revealed that risky behaviors remain prevalent, with 55.1% of female boarding school students sleeping together or sharing a mattress. Furthermore, univariate analysis showed that all physical environmental parameters of the dormitory, including temperature, humidity, lighting, and occupancy density, failed to meet health standards.

This study aligns with research by [Aulia \(2022\)](#) at the Thawalib Islamic Boarding School in Padang, which also found no significant association between bedding and sheet cleanliness and the number of scabies cases ($p = 0.129$). This explains that when a dormitory community is exposed to a physical environment that is 100% substandard, personal preventive measures such as maintaining mattress cleanliness lose their protective effect. Mites can spread freely on the floor, walls, and in the air of the dormitory through dust, due to the overcrowded, humid, and dark conditions of the dormitory rooms. The findings of a study conducted by [Ramadhan \(2025\)](#), which emphasized that physical distance between students while sleeping is reduced by high dormitory occupancy density, exacerbate this condition. Consequently, since the disease-causing agent has contaminated the entire community, both female students who diligently clean their beds and those who neglect to do so are highly vulnerable to mite infection.

CONCLUSION

The Nurul Huda Islamic Boarding School has a high prevalence of scabies (76.8%). Towel hygiene ($p = 0.008$) and clothing hygiene ($p = 0.002$) are significant direct risk factors for personal hygiene. Conversely, knowledge levels ($p = 0.364$) and bedding hygiene ($p = 0.096$) were not statistically significantly associated. This is due to a "floor effect" resulting from the dormitory's physical environmental conditions (overcrowding, humidity, and lighting), which are entirely unhealthy, thereby undermining the protective effects of personal hygiene. As an intervention measure, boarding school management is advised to immediately improve basic sanitation by optimizing ventilation and natural lighting, limiting room density, and providing adequate clothes drying facilities, while enforcing regulations prohibiting the sharing of clothing or towels. On the other hand, female students are urged to increase their personal awareness by avoiding the habit of sharing personal items and by ironing their clothes at high temperatures to kill dust mites. For future scientific development, subsequent research is recommended to use a quasi-experimental design to test the effectiveness of a combined intervention involving education on personal hygiene behavior modification and physical renovations to improve dormitory sanitation, while employing the skin scraping method to obtain more accurate clinical diagnostic confirmation.

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