

## FACTORS ASSOCIATED WITH THE INCIDENCE OF SCABIES AT HIDAYATULLAH ISLAMIC BOARDING SCHOOL, SOUTHEAST ACEH REGENCY

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**Abstract.** Scabies is a contagious skin disease caused by *Sarcoptes scabiei*, which indirectly via direct contact or fomites, especially in crowded, hungry spells and dirty living situations. It impacts over 400 million people annually and, in accordance with the World Health Organization, it is included as a neglected tropical disease in the WHO 2021–2030 Roadmap. This study envisaged as an analysis of factors associated with scabies incidence. Data was collected from students at Hidayatullah Islamic Boarding School in Southeast Aceh Regency. A quantitative study with a cross-sectional design was conducted from June 2024 to June 2025 involving 120 students selected through total sampling. Data were collected using structured questionnaires and analyzed using SPSS through univariate, bivariate (chi-square), and multivariate (logistic regression) analyses. The results showed that knowledge ( $p=0.001$ ; OR=7.03; 95% CI=2.16–22.84), attitude ( $p=0.015$ ; OR=4.49; 95% CI=1.33–15.12), personal hygiene ( $p<0.001$ ; OR=23.29; 95% CI=5.50–98.54), environmental sanitation ( $p<0.001$ ; OR=14.71; 95% CI=4.12–52.54), and support from boarding school management ( $p=0.005$ ; OR=8.94; 95% CI=1.96–40.79) were significantly associated with scabies incidence, with personal hygiene identified as the most dominant factor. These findings indicate that improving students' knowledge and attitudes, strengthening personal hygiene practices, enhancing environmental sanitation, increasing support from boarding school management, collaborating with healthcare providers, and providing special attention to newly admitted students are essential strategies to reduce the incidence of scabies in Islamic boarding school settings.

**Keywords:** Scabies, Boarding school, cross sectional study

## 1. Introduction

Scabies is a neglected tropical disease caused by the infestation of *Sarcoptes scabiei* mites, primarily transmitted through direct skin contact. It presents with intense itching and rash, affecting over 400 million people annually. The World Health Organization (WHO) included scabies in the Neglected Tropical Diseases (NTD) roadmap 2021–2030, targeting its integration into universal health coverage by 2030 (WHO, 2020). Global prevalence rates varying from 0.4% to 71% have been reported for the period of 2000 till 2024, with higher rates in the Western Pacific (the African and South-Eastern Asia regions are also considered) (Gupta et al., 2024; Aždajić et al., 2022). The highest prevalence was found in a study of boarding school students, with both studies conducted within Indonesia (Rihatmadja et al., 2019), suggesting communal living environments heighten susceptibility.

Favourable factors on Scabies transmission at boarding schools has been investigated in several previous studies, and factors like personal hygiene, overcrowding, sanitation facilities access as well as clean water access have become an important determinants for scabies (Jumadewi et al., 2023; Hazimah et al., 2020; Sari, 2021). Transmission is further facilitated by environmental factors, such as inadequate ventilation and bedding (Umam et al., 2023; Yudhaningtyas, 2018). Poor level of knowledge, negative attitude and lack of health system support have also established as risk factors enhancing the scabies prevalence (Aliffiani & Mustakim, 2020; Andriani et al., 2024). The first survey at Hidayatullah Islamic Boarding School.

## 2. Methods

This research was a quantitative cross-sectional study to find out the factors studied on students of Hidayatullah Islamic boarding school, Lawe Sigala-gala District, Southeast Aceh Regency from June 2024 to May 2025. Study population consisted of all 120 students enrolled in the boarding school. Due to the small population size, total sampling was performed to cover the entire population. Eligible students were those who chose to take part in the study (i.e., enrolled during sample data collection period) and were present on the days that data were collected (i.e. missing pupils on data collection days were excluded). Out of these, 120 met the eligibility criteria and were included in final analysis.

The independent variables of this study were knowledge, attitude, personal hygiene, environmental sanitation and boarding school management support. The occurrence of scabies among students was regarded as the dependent variable. The choice of variables was based on literature review and theoretical relevance to scabies transmission and prevention in board school settings.

Utilized both primary and secondary data. We collected primary data using validated questionnaires, physical skin examinations and environmental observation. Pearson correlation analysis was used to assess the validity of the questionnaire and items with a correlation coefficient exceeding the critical value from the Product Moment table were deemed valid. We examined reliability with Cronbach's alpha, a value of 0.6 is the threshold indicating that items have sufficient internal consistency. Student attendance records from the school management were used as secondary data.

SPSS software was used for data analysis. description of the distributional characteristics for independent variables using univariate analysis. We investigated their association with scabies incidence by means of bivariate analysis applying the chi-square test ( $\alpha = 0.05$ ). A logistic regression was utilized to identify the main factor.

### **3. Results**

Hidayatullah Islamic Boarding School, founded in 2021 and located in Lawe Loning Aman Village, Lawe Sigala-gala Subdistrict, Southeast Aceh Regency is an educational institution that combines the values of Islam with formal education and character to face global changes. Non-Boarding Academic schooling. Boarders stay on school property during the week and follow a daily timetable which includes lessons, religious education classes and recreation with fellow students, supervised by school staff. Whereas non-boarding students engage in the same curricular activities but go home after school. These traits form a shared living space that may help students live with close physical contact.

Based on Table 1, most respondents were female (51.7%) and aged 13–17 years (65.8%). The majority were junior high school students (grades 7–9), accounting for 75% of the sample. Additionally, 51.7% had been enrolled at the boarding school for one year or less.

Table 1. Characteristics of Respondents

| Characteristics            | N=120 | %    |
|----------------------------|-------|------|
| Sex                        |       |      |
| Male                       | 58    | 48.3 |
| Female                     | 62    | 51.7 |
| Age                        |       |      |
| 8-12 years                 | 41    | 34.2 |
| 13-17 years                | 79    | 65.8 |
| Class                      |       |      |
| 4-6 (Elementary School)    | 25    | 20.8 |
| 7-9 (Junior High School)   | 90    | 75   |
| 10-11 (Senior High School) | 5     | 4.2  |
| Length of education        |       |      |
| ≤ 1 year                   | 62    | 51.7 |
| > 1 year                   | 58    | 48.3 |
| Scabies Incident           |       |      |
| Yes                        | 65    | 54.2 |
| No                         | 55    | 45.8 |

Respondents with poor knowledge had a higher prevalence of scabies (72.1%) compared to those with good knowledge (44.2%). A significant association was found between knowledge and scabies incidence ( $p = 0.006$ ; OR = 3.27; 95% CI: 1.46–7.30). Poor personal hygiene was also strongly associated with scabies, with 86.8% of affected respondents having poor hygiene ( $p < 0.001$ ; OR = 10.31; 95% CI: 3.65–29.18). Environmental sanitation showed a similar pattern, where 81.8% of those with poor sanitation had scabies ( $p < 0.001$ ; OR = 7.29; 95% CI: 2.98–17.85). Additionally, lack of support from school management was significantly linked to scabies incidence ( $p = 0.003$ ; OR = 5.12; 95% CI: 1.79–14.67). In contrast, no significant association was found between attitude and scabies ( $p = 0.212$ ) (Table 2).

Table 2. Respondent Characteristics Based on Measured Variables

| Variable  | Scabies Incident    |                        |                       | p value | OR<br>(95% CI) |
|-----------|---------------------|------------------------|-----------------------|---------|----------------|
|           | Scabies<br>N=65 (%) | No Scabies<br>N=55 (%) | Total<br>N=120<br>(%) |         |                |
| Knowledge |                     |                        |                       |         |                |
| Less      | 31 (72.1)           | 12 (27.9)              | 43 (100)              | 0.006   | 3.27           |
| Good      | 34 (44.2)           | 43 (55.8)              | 77 (100)              |         | (1.46 – 7.3)   |

|                                             |           |           |          |        |                |
|---------------------------------------------|-----------|-----------|----------|--------|----------------|
| Attitude                                    |           |           |          |        |                |
| Less                                        | 46 (59)   | 32 (41)   | 78 (100) | 0.212  | -              |
| Good                                        | 19 (45.2) | 23 (54.8) | 42 (100) |        |                |
| Personal hygiene                            |           |           |          |        |                |
| Less                                        | 33 (86.8) | 5 (13.2)  | 38 (100) | <0.001 | 10.31          |
| Good                                        | 32 (39)   | 50 (61)   | 82 (100) |        | (3.65 – 29.18) |
| Environmental sanitation                    |           |           |          |        |                |
| Less                                        | 36 (81.8) | 8 (18.2)  | 44 (100) | <0.001 | 7,29           |
| Good                                        | 29 (38.2) | 47 (61.8) | 76 (100) |        | (2.98 – 17.85) |
| Support from the boarding school management |           |           |          |        |                |
| Less                                        | 22 (81.5) | 5 (18.5)  | 27 (100) | 0.003  | 5.12           |
| Good                                        | 43 (46.2) | 50 (53.8) | 93 (100) |        | (1.79 – 14.67) |

Variables with p-values less than 0.25 in the bivariate analysis were included in the multivariate logistic regression model. As shown in Table 3, five variables were significantly associated with the incidence of scabies among students. Poor personal hygiene was identified as the strongest predictor, with students who had poor hygiene being 23.29 times more likely to develop scabies compared to those with good personal hygiene ( $p < 0.001$ ; OR = 23.29; 95% CI: 5.50–98.54). Inadequate environmental sanitation also showed a strong association ( $p < 0.001$ ; OR = 14.71; 95% CI: 4.12–52.54), followed by lack of support from boarding school management ( $p = 0.005$ ; OR = 8.94; 95% CI: 1.96–40.79), poor knowledge ( $p = 0.001$ ; OR = 7.03; 95% CI: 2.16–22.85), and negative attitude ( $p = 0.015$ ; OR = 4.49; 95% CI: 1.33–15.12).

Table 3. Logistics Regression Analysis Results

| Variable                                    | B     | Sig.  | Exp(B) | 95%CI        |
|---------------------------------------------|-------|-------|--------|--------------|
| Knowledge                                   | 1.950 | 0.001 | 7.03   | 2.16 – 22.84 |
| Attitude                                    | 1.501 | 0.015 | 4.49   | 1.33 – 15.12 |
| Personal hygiene                            | 3.148 | 0.000 | 23.29  | 5.50 – 98.54 |
| Environmental sanitation                    | 2.688 | 0.000 | 14.71  | 4.12 – 52.54 |
| Support from the boarding school management | 2.191 | 0.005 | 8.94   | 1.96 – 40.79 |

In the logistic regression analysis, the reference categories for each variable were: good knowledge, positive attitude, good personal hygiene, adequate environmental sanitation, and sufficient support from the boarding school management. Although attitude was not significantly associated with scabies in the bivariate analysis, it became statistically significant in the multivariable logistic regression after adjustment for other covariates. This finding suggests the presence of confounding effects among the independent variables.

#### **4. Discussion**

Knowledge is succeeded as an important determinant associated with incidence of scabies among students at Hidayatullah Islamic Boarding School. This finding is consistent with Hasan et al based on the work by Hasan et al. (2023), who found that knowledge is intricately linked with awareness and disease transmission and preventive practices. Conclusion Although the overall knowledge of students concerning scabies was good (64.2%), significant gaps were identified in their knowledge on some items. Despite a history of scabies, only 20.0% of students about the disease's clinical signs correctly recognized, and only one-fourth (23.8%) understood that indirect transmission could occur via sharing commonly used personal items. These results indicate that general knowledge alone might not be sufficient to decrease the susceptibility of infection. In the context of boarding school, the likelihood of close contact and common-use facilities combined with an only partial understanding of symptoms and ways of transmission means that effective prevention may be challenging. Accordingly, education interventions should emphasize more grounded information about symptoms, routes of transmission, and prevention.

Health promotion has long acknowledged the connection between knowledge and behavior. According to Albyn (2023), this will ensure that health education programs in boarding school settings will give positive contributions to better hygiene practices of the students. But the current results show that good knowledge is not a sufficient precursor of healthful everyday practices. There was evidence that some students adhered to potentially riskier behaviours even when they were aware of the need for safety, indicating an awareness-behaviour implementation gap. Although instructional methods based on the mechanisms of action appear conceptually suitable, they will need

to be designed not just for information but also adherence to repeated use in daily living.

There was also a strong association between the students' attitudes and the presence of scabies. Positive attitudes on personal hygiene and diseases prevention can give rise to healthy behaviors, while indifferent attitude may reduce students inclination toward the practice forms of gender [45]. As detailed by Sunaryo (2004) that attitude includes beliefs, feelings and behavior potential that can influence the individual in responding to events related health. Thus, attitudes might be a necessary mediator between knowledge and preventive behaviors.

The present study showed that negative attitude towards scabies preventive self-behavior was still common among the students. Of those with scabies, 90.8% thought sleeping in the same bed as infected persons would not spread the disease. Separating laundry from infected peers also seemed unnecessary to many students. Such myths point to a lack of understanding of both direct and indirect pathways. Similar to what Sari and Ambarwati (2023) reported, more than just information is necessary for effective prevention. Consequently, scabies prevention should be primarily based on awareness raising, attitude change, and long-term commitment to hygiene behaviour.

A pertinent variable to be associated with scabies incidence among students was personal hygiene. This finding is in accordance with previous studies based on the study of Sulistiarini et al. (2022) and Hasan et al. (2023), which found that hygiene-related behaviors were key variables associated with scabies occurring. Bathing without soap, infrequent change of clothing and share towels can increase the transmission risk, especially in social groups living together with frequent social contact. Such behaviours often become embedded in established routines and therefore changing behaviour may require continual monitoring and reinforcement.

Although 68.3% of the students were classified as practicing good personal hygiene, a more in-depth assessment revealed that several affected students had emerged with inappropriate practices. Only 215 used their own clothing all the time; only 231 used personal bathing supplies and never shared with anyone? These behaviors could lead to indirect transmission via contaminated objects. The sharing of personal items seems to be homogenized, and closely related to the strong social relationships we see at many boarding schools as well as a generalized communal

culture. Emphasising the importance of personal hygiene as a health behavior may potentially help reduce scabies transmission within and outside of boarding school, by enhancing students' perception of their responsibility to maintain personal hygiene.

Environmental sanitation is an important aspect of public health as it helps prevent skin infections including scabies. Scabies parasites tend to live and thrive in neglected environments, and the conditions of captivity become richer sources for their breeding, more remarkably in a densely populated place. Transmitted easily through sharing beds, bathrooms, clothes and sleeping stuff. Therefore, most important predisposing factors for scabies occurrence is related to sanitary condition in students' living environment.

A strong relationship between environmental sanitation, with incidence of scabies in Hidayatullah Islamic Boarding school. Preserving the hygiene and proper functioning of sanitation services is necessary to avoid transmission related to inanimate surfaces (Dinata, 2024). While the vast majority of students, as well as teachers, lived in fairly clean and tidy homes with good toilet and bedding facilities, there were, nevertheless positive structural problems. The dormitory walls and floors were not waterproof, potentially resulting in indoor humidity particularly during the rainy season that could allow *Sarcoptes scabiei* to live and disseminate.

Management support emerged as another factor significantly associated with scabies incidence. The involvement of boarding school administrators and staff may contribute to the establishment of healthy habits by providing supervision, guidance, and reinforcement of preventive behaviors. Consistent monitoring may help discourage practices associated with transmission, such as sharing bedding, clothing, and personal hygiene equipment. Furthermore, active engagement from school personnel may encourage students to adopt behaviors that support a healthier living environment (Qomariyah & Kusyairi, 2024).

Field observations indicated that most students received substantial support from school management regarding scabies prevention. As daily supervisors and role models, administrators and teachers play a central role in disseminating health information, monitoring hygiene practices, and encouraging compliance with preventive measures. Strong institutional support may foster a culture of collective responsibility in which students become more aware of hygiene-related risks and are motivated to maintain

healthy behaviors. Such an environment is particularly important in boarding schools, where disease prevention requires cooperation among all members of the community.

Several limitations should be considered when interpreting the findings of this study. First, the cross-sectional design precludes conclusions regarding causal relationships between the examined factors and scabies incidence. Second, bias could have been introduced to responses due to the nature of self administered questionnaires as students may not have understood some of the questions or answered in a socially desirable way. Third, this study was conducted in one Islamic boarding school; therefore the data may not be generalizable to all types of Islamic boarding schools. Finally, the present analysis was targeting selected variables and is likely to omit other relevant factors developing sarcoptic mange disease as explaining variations in incidence of scabies between students.

## **5. Conclusion**

Among the different variables, knowledge, attitude, personal hygiene and environmental sanitation as well as boarding school management support were statistically associated with the occurrence of scabies and was found to be most significant steps in disease control. Within boarding schools, strengthening health education on personal hygiene practices among students, implementation and enforcing stringent environmental sanitation protocol in the school campus as preventive strategies. Development of a periodic association with the healthcare professionals in the form of regular medical checkups and creation of student health cadres who will be responsible for spreading hygiene practices in each dormitory/classroom. This makes new pupils more sensitive because they may be less aware of the hygiene culture at school. Additional findings from this study can also be thoughtful peer-reviewed reference equations for postgraduate studies in public health, epidemiology and health promotion while helping student initiatives for community engagement and school-based health education.

## **6. Ethical Clearance**

Ethical clearance was granted by the Health Research Ethics Committee of Universitas Sumatera Utara, Number: 17/KEPK/USU/2025, dated January 14, 2025.

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