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Research Article

Factors Influencing Scabies Infection at the Al-Amin Islamic Boarding School in Sukabumi

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ABSTRACT

Background: Scabies are a common health problem in many countries, mainly in densely populated areas. The prevalence of scabies in first community health services in Indonesia is 5.6-12.9%. Scabies infection is associated with a lack of health education, small bedrooms with too many people living in poor sanitation, and a crowded environment found in public Islamic boarding schools in Indonesia. **Purposes:** To investigate the correlation between characteristics, knowledge, and hygiene behavior with the incidence of scabies among boarding school students. **Methods:** This is a cross-sectional analytic study; 150 subjects were conducted in this study, and eight subjects were excluded. Subjects were conducted for an examination and filled out a questionnaire to diagnose the scabies infection. Bivariate and multivariate logistic regression analyses were used to assess the risk factors of subjects associated with scabies infection. **Results:** 142 subjects were analyzed, and 77 (54.2%) were diagnosed with scabies. From bivariate analyses, we found that gender ($p<0.0001$), level of education ($p<0.0001$), and clean behavior ($p<0.0001$) were associated with scabies outcome. Male ($p=0.015$, OR 95% CI 4.3 (1.3 – 14.3), higher level of education ($p=0.012$, OR 95% CI 8 (1.58 – 41.2), and poor hygiene behavior ($p<0.0001$, OR 95% CI 1 (1.02 – 1.09) were independently associated with scabies infection. **Conclusions:** There was a significant association between gender, level of education, and clean behavior with scabies outcome. Males, low levels of education, and poor hygiene behavior increase the incidence of scabies infection. Age, nutritional status, and knowledge of scabies were not associated with scabies outcome.

Keywords: hygiene behavior, *sarcoptes scabiei*, scabies, school-age children, knowledge

INTRODUCTION

Scabies is an ectoparasitic skin infection caused by mites from the Sarcoptidae species *Sarcoptes scabiei var. of man*. Scabies is a global problem that affects all ages, races, and all socio-economics. Prevalence varies widely, with some underdeveloped countries having rates from 4% to 100% of the general population (1). In Indonesia, this disease is often called scabies; Javanese call it gudik, and Sundanese call it budug (2).

Transmission of scabies begins with skin-to-skin contact with scabies sufferers, including sexual contact with scabies sufferers. Scabies are highly infectious, and other transmission factors include using towels together, clothes of scabies sufferers, and bed sheets of patients (3). On examination of patients with scabies, papulovesicular erythematosus lesions, excoriation, and eczema dermatitis were found in the interdigital membranes, between fingers, elbows, axillaries, scrotum, penis, labia, and areola mammae in women. In addition, the most common complaint in people with scabies is itching that aggravates at night (4).

In Indonesia, scabies are one of the most common diseases that causes people to come to primary health in Indonesia. The prevalence of scabies patients seeking treatment at primary health in Indonesia in 2008 was 5.6-12.9%, the 3rd most common skin disease. In 2008, a survey was conducted in various slums, including final waste disposal sites and flats in Jakarta, which showed a scabies prevalence of 6.2%, Boyolali 7.4%, Pasuruan 8.2%, and Semarang 5.8% (5). People sleeping together in a crowded room is one of the factors that causes the transmission of scabies. Schools with dormitories are places with the highest prevalence of scabies. In a 2010 study, Islamic boarding schools in Indonesia found that most scabies covered East Jakarta at 51.6%, Aceh at 40.78%, and Malang at 89.9% (5).

A lack of health education can cause factors causing the incidence of scabies infection, small bedrooms with too many people living in them, densely populated areas, frequent changing of clothes, exchanging towels, dementia, poor sanitation, traveling to scabies endemic areas, family history of scabies, poverty, low socioeconomic status, malnutrition can be identified as determinant factors (6). Control of scabies has been widely studied, namely by controlling risk factors and administering anti-scabies drugs. Giving Permethrin 5% as an anti-scabies is still the main choice and has good effectiveness (7). Prevention of scabies can be divided into three, namely primary, secondary, and tertiary. Primary prevention is the prevention of diseases before periods of pathogenesis such as health promotion and special protection. Secondary and tertiary prevention is carried out during pathogenesis, that is, when mites infect the human body (8). This study aimed to investigate the correlation between characteristics, knowledge and hygiene behaviour with the incidence of scabies among boarding school students.

METHODS

The research design was an analytical study and cross-sectional analytics to assess correlations. The research was performed at Pesantren Al-Amin on 22 December 2022. The research subjects were students of Pesantren Al-Amin in Sukabumi. There were 142 samples of students from Pesantren Al-Amin in Sukabumi who met the inclusion criteria: students at the Al-Amin Islamic Boarding School Sukabumi who completed the informed consent and completed the data questionnaire completely. The excluded subjects were those who had not completed filling out the questionnaire and those who had immunodeficiency, immunosuppression, and glucocorticoid therapy; eight subjects didn't complete the questionnaire thoroughly.

The Chi-Square and Logistic Regression Test—data analysis using SPPS 25 for Mac-correlations between characteristics, knowledge, and clean behavior with scabies were analyzed. Data was collected by collecting questionnaires and direct examinations carried out by the medical team on the same day. Height and weight measurements were carried out

simultaneously during data collection. Nutrition measurement was conducted using WHO curved.

In this study, the research instrument used a validated questionnaire named "DeSkab"(9). The DeSkab instrument consists of patient identification, anamnesis, physical examination, and examination results that indicate the patient does not have scabies or suspected scabies (1). This study also used another validated questionnaire to measure the level of knowledge, hygiene behavior, and living conditions of research subjects (5,9–12). This research has passed ethical approval with number No.339/PE/KE/FKK-UMJ/XII/2022, issued by the Health Research Ethics Commission of the UMJ Faculty of Medicine and Health.

RESULTS

The number of school-age children who underwent examinations and filled out research and DeSkab questionnaires at the Al-Amin Islamic Boarding School for the 2022 period was 150 people. One hundred forty-two school-age children were included in the study sample; 77 had scabies, and 65 did not.

Table 1. Characteristic of Students at Al-Amin Islamic Boarding School Sukabumi

Variable	N	%
Gender		
Male	27	19
Female	115	81
Nutritional Status		
Normal	105	73.9
Midly stunted	27	19
Moderately stunted	6	4.2
Overweight	4	2.8
Scabies		
Yes	77	54.2
No	65	45.8
Level of Knowledge		
Poor	83	58.5
Good	59	41.5
Level of Education		
Low	125	88
High	17	12
Hygiene Behavior		
Poor	101	71.1
Good	41	28.9
Living Condition		
Crowded	0	0
Uncrowded	142	100

It was found that the majority of the subjects, namely 115 people (81%), were female, with the proportion of men as many as 27 people (19%). Most of the nutritional status of the subjects that were measured with BMI score was in the normal nutritional range, namely 105 people

(73.9%); the rest experienced *stunting* with statuses *mildly stunted* as many as 27 people, *moderately stunted* six people and four students fall into the category *overweight*. Students' knowledge level about scabies could be better; as many as 83 people (58.5%) while 59 people (41.5%) have good knowledge of scabies. Most students, namely 101 people (71.1%), have poor hygiene behavior, while the remaining 41 (28.9%) have good hygiene behavior. All students who live and settle in the dormitory sleep in one room which is occupied by 20-28 students in each room.

Description (Table 2): Categorical data are expressed as sums and % and analyzed by the Kai Squared test. Normal distributed numerical data were expressed as mean ± SD and analyzed by the independent-t test. In contrast, data in normal non-distributed numerics were expressed in the median form (min-max) and analyzed by the Mann-Whitney test. (*) The variable is meaningful if the value of P value is <0.05. Based on the analysis of gender characteristics and the incidence of scabies, shown in Table 2, it was found that there was a relationship between gender and the incidence of scabies (61/53%) (P value <0.0001). In the group of scabies, 63 people (57.3%) were in 7th grade. In comparison, the percentage of non-scabies cases was higher in 9th grade (15 /88.2%) (P value <0.0001) with a poor level of knowledge (P value 0.496) 68 people (67.3%) had poor hygiene behavior in the group with scabies. In comparison, 32 people (78%) (P value <0.0001) had good hygiene behavior in the non-scabies group. The nutritional status of school-age children did not have a significant relationship with the incidence of scabies (P value 0.174).

Table 2. Correlation between Characteristic, Knowledge, and Hygiene Behavior with Scabies Infection at Al-Amin Islamic Boarding School Sukabumi

Variable	Scabies	Not Scabies	Total	P Value
Gender				
Male	23	4	27	<0.0001
Female	54	61	115	
Nutritional Status				
Normal	59	46	105	<0.0001
Midly stunted	15	12	27	
Moderately stunted	3	3	6	
Overweight	0	4	4	
Level of Knowledge				
Poor	7	36	83	0.496
Good	30	29	59	
Level of Education				
Low	75	2	77	0.496
High	15	50	65	
Hygiene Behavior				
Poor	68	33	101	<0.0001
Good	9	32	41	

Table 3. Multivariate Analysis between Scabies, Gender, Level of Education, and Hygiene Behavior

Variable	Scabies		OR (95%CI)	*P* value
	Yes	No		
Gender				
Male	23 (85.2%)	4 (14.8%)	4.3 (1.3-14.3)	**0.015**
Female	54 (47%)	61 (53%)		
Level of Education				
Low	75 (60%)	50 (40%)	8 (1.58-41.2)	**0.012**
High	2 (11.8%)	15 (88.2%)		
Hygiene Behavior				
Poor	68 (67.3%)	33 (32.7%)	1 (1.02-1.09)	**<0.0001**
Good	9 (22%)	32 (78%)		

In the results of multivariate analysis, it appears that the incidence of scabies is influenced by gender, and males have an increased risk of scabies incidence as much as 4.3 times higher than females. A low level of education has a higher risk of scabies incidence, as much as eight times compared to a higher level of education. This data also found that poor hygiene behavior had a more significant chance of scabies occurrence than good hygiene behavior.

DISCUSSION

There are school-age children ranging from 6-15 years, the average age of children who often experience scabies ranges from the age of 10-15 years. In this study, the average age of respondents was 13 years. The incidence of scabies in this study was found to be 54.2%. The incidence of scabies in children living in dormitories was also found as in a cross-sectional study conducted by Tahani at the Darul Falah Asahan-Kisaran Islamic Boarding School which found as many as 69.6% of students who had scabies infections (13). In another study conducted by Naftassa, scabies infection in boarding school children was found to be 82% (14). This can be caused by the density of residents in the student room which is related to the pathophysiology of the cause of scabies infection. A total of 142 students who were the subjects of the study were in one room containing 20-28 students sleeping in the same place and on the same pedestal, this result was obtained from the results of interviews during the question and answer session after counseling.

The level knowledge of students about scabies varies, almost half of the students (58.5%) do not have good knowledge about scabies, some of them have good enough knowledge about scabies, which may be caused by the high rate of infection in students. Most subjects were at level 7 of educational age (77.5%) and the rest were at level 8 (10.6%) and level 9 (12%). Student hygiene behavior is mostly rated poor (71.1%), this is in accordance with the findings of the CHLB (*Clean and Healthy Living Program Behavior*) study by Susanto (15) found low rate of hand washing using water and soap in students living in dormitories. Low levels of knowledge and poor hygiene behavior are associated with disease infestations caused by lack of personal hygiene.

Correlation of research characteristics with the incidence of scabies

From the basic characteristics of the subjects, the number of female students who experienced scabies was more than male students, which has 54 people, but the results of the meaning test found a significant relationship between sex and the incidence of scabies

(P<0.0001) that men were quite significant against higher scabies infestation. This is in accordance with a cross-sectional study conducted by Husna. The study involved 112 people at the Padang City Health Center who found that men had a greater risk of scabies infection (16). In another study conducted by Arisandi et al in 2018 found that in two Islamic boarding schools in South Sumatra, the same results were obtained. In the study it was said that men had a 5.8 times higher risk of scabies infection (17).

At higher levels of education, the incidence of scabies tends to be less than at lower levels of education (P<0.0001). This is supported by research conducted by Ratnasari at boarding school in East Jakarta founded that the scabies rate was higher at the Tsanawiyah level or equivalent to Junior High School than in Aliyah students or equivalent to Senior High School (18). Level of knowledge of scabies to the incidence of infection did not have significant relationship (P = 0.496). This is not in accordance with a study conducted by Damayanti at Islamic boarding schools in Ciamis which shows that the higher the knowledge of scabies, the lower the infection rate (18).

Incidence of scabies infection also has a significant relationship with student hygiene behavior (P<0.0001). This finding is supported by a cross-sectional study by Damayati in 2021 that linked poor hygiene behavior to increased rates of scabies infections (19). Nutritional status had no meaningful relationship with the incidence of scabies (P = 0.174). This finding was match with a study in Bali Province by Anggreni in 2019. The study also found no correlation between nutritional status and the incidence of scabies infection, although in this study most of the population studied was underweight (20).

Nutritional status had no meaningful relationship with the incidence of scabies (P = 0.174). This finding was match with a study in Bali Province by Anggreni in 2019. The study also found no correlation between nutritional status and the incidence of scabies infection, although in this study most of the population studied was underweight (21).

Final results of correlation between Sex, Education Level, and Hygiene Behavior with Scabies Infection

In this study, after multivariate analysis that has been adjusted, a significant association between the output of scabies infection and sex (P = 0.015), in the form of an increased risk 4.3 (1.3-14.3) times higher in the male sex than female. Scabies output has stronger association with lower levels of education. This group had an increased risk of scabies incidence 8 (1.58-41.2) times higher than those with higher education levels (P = 0.012). Hygiene behavior has strong relationship with scabies infection (P<0.0001), where poor hygiene behavior increases the risk of scabies incidence by 1 (1.02-1.09) times higher than in the group with good hygiene behavior.

CONCLUSION

This study found that the incidence of scabies in Al-Amin Islamic Boarding School students was 54.2% (77 people). Male, education level, and hygiene behavior are significantly related to scabies infection. On the other hand, children's age, nutritional status, and level of knowledge about scabies had no relationship to scabies. This research is cross-sectional, so it only shows

a linkage. Still, it cannot explain a causal relationship, and researchers do not include confounding factors in the analysis so that bias cannot be assessed.

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CONFLICT OF INTEREST

The authors do not have a conflict of interest that could raise biased.

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