

Risky Behaviors in Scabies Transmission Among Islamic Boarding School Students in Central Java – Indonesia: A Mixed-Method Study

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Abstract: This study aimed to determine the risk factors of scabies transmission among male students of private Islamic Boarding School. This research used an explanatory sequential mixed method design. The study sample was chosen using cluster sampling, while the respondents were 142 students (CI: 95%). Qualitative data was obtained through observation, focus group discussion, and in-depth interviews with 9 participants. The prevalence of scabies in the study was 69.0%. Soap usage for baths twice a day, washing hands regularly, sharing clothes, bedding, and towel are statistically significant with the occurrence of scabies. Less knowledge, awareness, and care to behave healthily are predisposing factors to risky behavior in transmitting scabies. Meanwhile, the lack of the number of beds and bedrooms become an enabling factor. Usually, sharing prayer stuff, towel, and clothes among students and lack of school staff role in providing health education become reinforcing factors that increase the likelihood of students spreading scabies.

Keywords: Islamic Boarding School, mixed-method study, risky behavior, scabies

1 Introduction

Scabies is a public health problem that occurs, particularly in source-poor societies, both in developing and developed countries [1],[2]. Global Burden Disease 2015 revealed that the prevalence of scabies has increased by 6.6% from 2005 to 2015 [3]. In many resource-poor communities, scabies is endemic with a prevalence of 20% and higher with several factors contributing to that condition, such as presence and infestation of family members, overcrowding, poor living conditions, limited access to water, and low levels of education [1],[4]. Additionally, the incidence in a tropical climate was the highest, with rates of up to 25% overall and higher than 50% in some counties in the South Pacific and Northern Australia [5],[6]. Furthermore, children, adolescents, and older people have a more significant number [6].

Indonesia is one of the countries that have a high burden of scabies. As depicted by GBD studies, Indonesia has the highest age-standardized scabies DALY burdens per 100000 people [6]. One of the places that are characterized by a high incidence of scabies cases in Indonesia is Islamic Boarding School. Several studies have stated that the prevalence of scabies in Islamic Boarding School in Indonesia ranges from 23% to higher than 50% [7],[8],[9]. One type of

Islamic boarding school in Indonesian, Pondok Pesantren, is a traditional Islamic Boarding School where the students stay in the dormitory and learn under the guidance of Muslim scholars which are known as Kyai [10]. Quantitatively, the number of Islamic Boarding School in Indonesia is more than 50,000 [11]. Unfortunately, several Islamic Boarding Schools have still not overcome a lack of personal hygiene, such as sharing towels, clothes, and beds, and not using soap in taking baths and handwashing [12]. They also have poor sanitation conditions, such as overcrowding, high humidity, and lack of room ventilation and sanitation facilities [8].

Numerous researches have been conducted to identify the risk factors of scabies in the Islamic Boarding School in Indonesia. Yet, there is a lack of studies investigating scabies disease in Islamic Boarding School using a qualitative approach. This study aims to determine the risk factors of scabies in one of the private Islamic Boarding Schools in Central Java. The quantitative method and qualitative part of this study both aim to explore more in-depth on the risk factors of scabies happening in the school where specifically in the qualitative part. We used the PRECEDE (predisposing, reinforcing, and enabling constructs) model as a conceptual framework to examine factors that contribute to the transmission of scabies among students. The model, hopefully, could provide a comprehensive image of the factors that influence behavior hence may provide an evidence-based solution for stakeholders to build an effective public health program to change risky behavior [13].

2 Method

This research used an explanatory sequential mixed method design [14]. The quantitative method is used to analyze risk factors of scabies, and the qualitative approach is used to answer why and how regarding the quantitative findings through exploring predisposing, enabling, and reinforcing factors that may influence students' risky behavior that allows scabies transmission. The site of this study was one private Islamic Boarding School located in Central Java, Indonesia. The data was collected from September until November 2017. The study sample was chosen using random cluster sampling by choosing six forms, nine rooms of the dormitory. Students who stay in the selected place were recruited for the study. The number of respondents was 142.

For quantitative data, respondents were asked to answer a questionnaire. Data collection comprised of socio-demographic characteristics, student behavior, and knowledge regarding scabies disease. Socio-demographic questions were asked to identify students' age, class, and length of stay in the dormitory. Questions about knowledge of students were asked to identify students' knowledge regarding scabies transmission and prevention. Questions of student behavior were asked to identify student behavior on frequent and usage of soap while taking baths, sharing bedding, cloth, prayer stuff, and towel, and usage of soap for washing hands frequently. Subsequently, respondents received a physical examination undertaken by three medical doctors to determine their scabies status. Students who have scabies infestation were referred to primary health care to get treatment by the general practitioner, free of charge.

Qualitative data was obtained through observation and in-depth interviews with participants. The observation was conducted just once in the bedrooms of students. A purposive sampling method was used in determining respondents of the qualitative part. The study participants were nine people that comprised of 5 students and three heads of the dormitory rooms and one head of the school health center.

The students are chosen representatively from 5 dormitory rooms. All of the student participants are males, and their ages range from 13 – 17 years old. The heads of dormitory rooms are alumni of the school who wants to dedicate their lives to the school by staying in the dormitory. Their responsibilities are to oversee students in each room and ensure every student follows all the school rules. Moreover, they are also responsible for the students' health condition, such as when a student is sick, they should assist so that the student get proper health care. Therefore, all the dormitory room heads have education at the senior high school level, and their ages range from 19 – 23 years old.

The school health center in the Islamic Boarding School in Indonesia is called Pos Kesehatan Pondok Pesantren (Poskestren). It is a community-based health care center in the Islamic Boarding School that is operated by the school staff and students to provide health promotion, disease prevention, and basic of curative and rehabilitative care [15]. The head of the school health center is a 40-year-old female with a background as a medical doctor.

The questionnaire for in-depth interviews identifies predisposing, enabling, and reinforcing factors that contribute to increasing the likelihood of students' behavior in spreading scabies. The questionnaire included open-ended exploratory questions. Interviews were recorded by taking notes manually rather than an audio recording.

Institutional authorization was obtained from the Islamic Boarding School Management, which are the authorities in charge of Islamic Boarding School. In addition, ethical clearance was issued by the Ethical Review Board of the Faculty of Public Health, University of Indonesia, with number 472/UN2.F10/PPM.00.02/2017. Information regarding the research procedure had been explained, and respondents who agreed to enroll in the study signed a consent form. The students who did not participate were neither reprimanded nor sanctioned.

Data were analyzed using SPSS version 22.0 (IBM Corp. Armonk, NY). A Chi-square test was conducted to determine associations between dependent (presence of scabies infection) and independent variables (knowledge and behavioral characteristics). Odds ratios (OR) and 95% confidence intervals were calculated for all factors. Statistical significance was set at $p < 0.05$. In the qualitative phase, thematic content analysis was used to analyze the data. Research themes that had been determined prior to the study were barriers from individual and school management.

3. Result

The age of respondents ranged from 12 to 17 years. The most dominant age group was 14 years (31.7%). The number of students in one bedroom ranged from 10 to 50. The mean (SD) number of students in one room was 26 (± 9) students. Most of the respondents have stayed in the dormitory for two years (48.6%) and three years (40.1%). The prevalence of scabies in the study was 69.0% (table 1).

Table 1. Respondent demographic characteristics

Variable	n	%
Age (year)		
12	2	1.4
13	40	28.2
14	45	31.7
15	25	17.6

Variable	n	%
16	24	16.9
17	6	4.2
School grade		
8	61	43.0
9	48	33.8
10	2	1.4
11	31	21.8
Length of stay (year)		
1	12	8.5
2	69	48.6
3	57	40.1
4	2	1.4
5	2	1.4
Scabies		
Yes	98	69.0
No	44	31.0

Bivariate analysis revealed variables significantly associated with scabies among students, which are the usage of soap for baths, washing hands regularly with soap, sharing clothes and prayer stuff, sharing bedding, and sharing a towel. Subjects who did not wash hands regularly had 3.30 times (95%CI: 1.25 – 8.67) greater risk of being infected by scabies than those who washed hand regularly. Moreover, subjects who shared their clothes and beddings, respectively, 2.22 times (95%CI: 1.05 – 4.70), 3.01 times (1.24 – 7.29) greater risk of scabies infection than ones who did not share their stuff. Furthermore, usage of soap for baths at least twice daily and not sharing towels were protective factors (table 2).

Table 2. Bivariate analysis of factors associated with scabies infections

Variable	Total n = 142 (%)	Scabies n = 98 (%)	Non- Scabies n = 44 (%)	OR (95% CI)	p-value
Age (year)					
≥14	100 (70.4)	67 (67.0)	33 (33.0)	0.72 (0.32 – 1.61)	0.423
< 14	42 (29.6)	31 (73.8)	11 (26.2)		
Length of stay (year)					
≥3	59 (41.5)	37 (62.7)	22 (37.3)	0.61 (0.30 – 1.24)	0.171
< 3	83 (58.5)	61 (73.5)	22 (26.5)		
Knowledge					
Low	92 (64.8)	61 (66.3)	31 (33.7)	0.69 (0.32 – 1.49)	0.449
High	50 (35.2)	37 (74.0)	13 (26.0)		
Usage of soap for baths					
Less than twice daily	95 (66.9)	59 (62.1)	36 (37.9)	0.37 (0.14 – 0.80)	0.019
At least twice daily	47 (33.1)	39 (83.0)	8 (17.0)		
Washing hand regularly with soap					
No	122 (85.9)	89 (73.0)	33 (27.0)	3.30 (1.25 – 8.67)	0.025
Yes	20 (14.1)	9 (45.0)	11 (55.0)		
Sharing clothes					
Yes	98 (69.0)	73 (74.5)	25 (25.5)	2.22 (1.05 – 4.70)	0.035
No	44 (31.0)	25 (56.8)	19 (43.2)		
Sharing bedding					
Yes	117 (82.4)	86 (73.5)	31 (26.5)		0.024

Variable	Total n = 142 (%)	Scabies n = 98 (%)	Non- Scabies n = 44 (%)	OR (95% CI)	p-value
No	25 (17.6)	12 (48.0)	13 (52.0)	3.01 (1.24 – 7.29)	
Sharing towel					
Yes	80 (56.3)	49 (61.3)	31 (38.8)	0.42 (0.20 – 0.90)	0.037
No	62 (43.7)	49 (79.0)	13 (21.0)		

Table 3 shows the predisposing, enabling, and reinforcing factors that influence students' risky health behavior that increases the likelihood of spreading scabies. Predisposing factors included tolerating scabies infection and not having enough knowledge, awareness, and care to behave healthily. Students were less aware of their health, specifically when having scabies infestation. One respondent stated that the school health center is open for students from morning until night, yet the students do not go to the facility even if they have been infected. The students usually go to health care when they have a secondary infection.

Table 3. Thematic analysis of predisposing, enabling and reinforcing factors regarding scabies transmission

Theme and Issues Reported	Illustrative quotes
Predisposing factors	
Tolerance to scabies infection	<i>"Students do not go to healthcare, even when they have been infected. They will only go to healthcare when they get a secondary infection (Head of Dormitory Healthcare)"</i>
Less knowledge, awareness, and care to behave healthily	<i>"The students lack awareness, knowledge, and understanding about healthy behavior and diseases (Head of Dormitory Healthcare)"</i>
Enabling factors	
Lack of number and size of bedrooms	<i>"One room is for about 20-40 students, and here we have 11 rooms for about 250 students (Head of Dormitory Room)"</i>
Lack of beds	<i>"Students sleep on the floor and mattresses are provided only for first-grade students, but later the mattresses become worn out, and students sleep on the floor (Head of Dormitory Room)"</i>
Reinforcing factors	
Usually sharing prayer stuff, towel, and clothes with others	<i>"There is a habit in the school to exchange clothes, towels, and prayer stuff among students (Head of Dormitory Room)"</i>
Exchange stuff among students symbolizes solidarity among students.	<i>"We usually exchange our stuff to express our intention to help others and to express our solidarity with each other (Student)"</i>

Theme and Issues Reported	Illustrative quotes
Students putting clothes on the same wardrobe and rack	<i>"The rack is not divided for each student. Student can use every rack that is available (Head of Dormitory Room)"</i>
Health education and promotion for students are seldom provided	<i>"We deliver information about health issues in dormitory every year for new students and sometimes university student and public health center also come to the dormitory to give health education for the student (Head of Dormitory Healthcare)"</i>
Lack of school staff knowledge and skill to promote health behavior	<i>"The room head does not have enough knowledge and skill to persuade the student to implement healthy behavior (Head of Dormitory Room)"</i> <i>"Room heads have their own business so that they do not give attention to the students, especially to behave healthily (Student)"</i>

Enabling factors have been determined by identifying school facilities that are deemed as the condition that contributes to the increasing likelihood of spreading scabies. Lack of bedrooms causes students to live in an overcrowded situation, and lack of beds causes students to sleep on the floor and have indirect contact with each other. Respondents said that one room was provided for about 20-40 students. The observational study depicted the condition of students' bedrooms. The size of the bedroom is 4 x 8m, and there was no bed in the bedroom. Three glass block windows with a capacity of 2 x 1m were found on the wall of the bedroom.

Several reinforcing factors have been determined by identifying students and dormitory staff activities that influence students' risky behavior in spreading scabies. The students were usually sharing their stuff with others, including clothes, towels, and prayer stuff. The informants stated that they shared the stuff was to symbolize solidarity among students, and their intention in practicing that behavior was to help each other. A small wardrobe is provided for every student. Nevertheless, as seen in the observational study, students placed and mixed their clothes on the top of the wardrobe. A long wooden wall cloth rack is put above the wardrobe. Every student has his own rack, but they shared the rack by mixing up the clothes with their friends'.

Another reinforcing factor has been determined by identifying the role of dormitory staff in providing health education for students. The school health center provides health education for every student at the beginning of the semester. The key topic is about how to prevent diseases and maintaining health. Health education is also given by external parties, such as representatives of the university or community health center. The respondent also said that dormitory room heads do not have enough knowledge about disease prevention, particularly scabies, and do not have enough skill to implement health promotion activities to persuade students to behave healthily. Furthermore, heads of bedrooms do not always stay in the dormitory when they have their activities such as university study or work. Therefore, they do not have the full-time availability to oversee students and ensure that they maintain healthy behavior.

4 Discussion

The number of students with scabies in this study is 69.0%. Usage of soap for baths, washing hands regularly, sharing clothes, bedding, and towel were the independent variables significantly related to the occurrence of scabies among students in this study. A study of male children's displacement camps in Sierra Leone identified a higher number of scabies (73.0%) than this study (65.6%) [16]. The number of scabies found in this study is lower than what was found in a Thai orphanage (87.3%) [17]. Yet the number of scabies in this study is higher than a study in the Islamic Religious Schools (Madrasahs) in India (61% and 62%) [18], higher than the prevalence of scabies in the prisoners of Bandar Abbas, Iran (57%) [19] and the prevalence of scabies in prisoners in Iran (2.2%) [20]. At the same time, it is also higher than the prevalence of scabies in a welfare home in Pulau Pinang, Malaysia (31%) [21], and more prevalent than in a study in Cameroonian Boarding Schools (17,8%) [22]. Findings in this study are confirmed in the previous studies, which found sharing beds, sharing of clothes, and toilet stuff were significant factors associated with the presence of scabies [23],[24]. While regular bathing habits and usage of soap for baths were protective factors [22],[24].

Based on the qualitative data, this study found that the students tend to be tolerated when they have scabies infestation. In Indonesia, scabies infestation among Islamic Boarding School students' is seen as a common condition. When students have scabies infestation, it is seen as the students have developed a close relationship with others [25]. This research also found that the students usually shared their stuff, such as clothes, prayer stuff, and towels. The result is confirmed by the previous study that started sharing stuff among students is a common expression symbolizing togetherness, which develops social solidarity among students in Islamic Boarding School [26].

This study found that more than half of the respondents (64.8%) have low knowledge regarding the transmission and prevention of scabies. Although the knowledge level of the student in this study was not statistically significant, another study in Indonesia found that the knowledge level was statistically significant with the occurrence of scabies where it was higher in students with a lower level of knowledge [27].

As an enabling factor, this study found that the number of beds and bedrooms were not adequately provided for the students. It results in overcrowding conditions, which are, in turn, due to the contagiousness of scabies that can easily cause an epidemic outbreak [28]. The dormitories, as a part of Islamic Boarding School, is a vital place for students where they spend most of their time. Therefore, there is a need to provide a positive and psychosocial school environment in order not only to prevent scabies but also to improve the life satisfaction of students [29].

A mass treatment and scabies control program involving school staff have to be performed towards an effective result in controlling scabies in a residential, institutional setting [18]. The school health center has an important role in increasing student access to healthcare [30]. School healthcare could provide health promotion and education programs to increase students' knowledge and awareness regarding the prevention of scabies. Moreover, there is also a need to inform school workers and staff about scabies impact and prevention so that they will be more aware to prevent the disease [31]. Last but not least, changing students' habits in exchanging stuff and tolerating scabies infestation should be done to provide more sustained effort in preventing the spread of scabies among Islamic Boarding School students. Successful scabies elimination on a large institutional scale highlights some requirements such as careful organization, simultaneous clinical examination, implementation of tropical treatment for all

exposed individuals, decontamination and quarantine measures, follow-up investigations, and repeated treatment [32].

A cross-sectional study that was used in this study to impede us from identifying that the predictors are independent risk factors of scabies. Dermoscopy and/or microscopy were not used to confirm the presence of mites, which involves a diagnosis of scabies only using the physical examination. This study should not be generalized to the entirety of the Islamic Boarding School in Indonesia as this research was only focused on traditional Islamic Boarding school.

5 Conclusion

Diverse causes predisposed scabies transmission among students. Less knowledge, awareness, and care to behave healthily are predisposing factors that lead students to risky behavior in transmitting scabies. Meanwhile, the lack number of beds and bedrooms becomes the enabling factor. Usually, sharing prayer stuff, towel, and clothes among students and lack of role of school staff in providing health education to students become the reinforcing factor that increases the likelihood of students spreading scabies. The intervention for preventing scabies transmission is not enough if it merely involves students because participation from school staff and ancillary staff were also needed.

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