

## The Relationship between Hygienic Practices and Scabies Infestation in a Boarding School in East Jakarta

Indra Sianturi,<sup>1</sup> Saleha Sungkar<sup>2</sup>

<sup>1</sup>Medical Science Program, Faculty of Medicine Universitas Indonesia

<sup>2</sup>Department of Parasitology, Faculty of Medicine Universitas Indonesia

### Abstract

*Scabies is a skin disease that is most common in Indonesia, especially in dense environments such as boarding occupants. This research aims to study the relationship of scabies with personal hygienic practices (PHB) in the male students in the boarding school X in East Jakarta. This cross-sectional study was conducted on March 8, 2014, and all students are the subjects of study (total sampling). Diagnosis of scabies was done with history taking and dermatological examination. PHB data was taken with a questionnaire containing 10 questions regarding the personal hygienic practices. The question was given a score of 0 to 1 for bad behavior and good behavior. Data were analyzed by chi square test. The results showed the prevalence of scabies was 36%, with 3.4% of good personal hygienic practices and 32.8% had poor personal hygienic practices. There are significant differences between the PHB and scabies ( $p = 0.008$ ). In conclusion, personal hygiene associated with scabies.*

**Keywords:** scabies, personal hygiene, prevalence, pesantren

## Hubungan antara Perilaku Hidup Bersih dengan Infestasi Scabies di Pesantren di Jakarta Timur

### Abstrak

*Skabies merupakan salah satu penyakit kulit yang paling umum di Indonesia, terutama di lingkungan padat penghuni seperti pesantren. Penelitian ini bertujuan untuk mempelajari hubungan skabies dengan perilaku hidup bersih (PHB) pada siswa laki-laki di Pesantren X di Jakarta Timur. Penelitian cross-sectional ini dilakukan pada tanggal 8 Maret 2014 dan semua siswa dijadikan subyek penelitian (total sampling). Diagnosis skabies dilakukan dengan anamnesis dan pemeriksaan dermatologis. Data PHB diambil dengan kuesioner yang berisi 10 pertanyaan mengenai PHB. Pertanyaan diberi skor 0 untuk perilaku buruk dan 1 untuk perilaku baik. Analisis data dilakukan dengan uji chi square. Hasilnya menunjukkan prevalensi skabies adalah 36% dan PHB yang baik 3.4% dan buruk adalah 32.8%. Terdapat perbedaan signifikan antara PHB dan skabies dengan ( $p=0.008$ ). Disimpulkan, kebersihan pribadi berhubungan dengan skabies.*

**Kata Kunci:** scabies, perilaku hidup bersih, prevalensi, pesantren.

## Introduction

Scabies is a profoundly itchy parasitic skin infection, which is caused by a mite; *Sarcoptes scabiei var hominis* that digs out tunnels descends mostly until the first layer of the epidermis.<sup>1</sup> Currently, there are about 300 million cases of scabies around the globe each year, where it could cause a major public-health problem vastly in less-developed country.<sup>2</sup> Around 6-27% of the general population are affected in developed country, with the highest incidence in the school-aged and adolescent groups.<sup>3</sup> In Indonesia, this parasitic infection is still a problem not only in remote areas, but also in metropolitan city such as Jakarta, with the prevalence of 4.6-13% and ranked the third out of twelve most prevalent skin diseases.<sup>4</sup>

The contributing factors to the spreading of this disease in the community are poor level of hygiene, lack of knowledge towards the disease, and low level of socioeconomic status. Scabies is highly widespread in clustered living group condition such as, boarding school, dormitories, military barracks, and orphanage with poor level of sanitation. The quality of life in infected individuals will degrade because of intensive itchiness at night, which will disturb the quality of sleep. Prolonged scratching from infected individuals may lead to skin rash or secondary infection, which depict the acute skin condition such as papule and mild erythema. In addition, the secondary infection will present as the polymorphic skin morphology of pustule, crust, excoriation, and etc.<sup>5</sup> Scabies affected performance in school of students in DI Aceh as reported in 2006, this may due to loss of concentration caused by chronic scratching.<sup>6</sup>

There is a boarding school (pesantren) in the area of East Jakarta, with a crowded living condition and high number of its student occupants (santri) is suffering from scabies. The need to eradicate scabies to stop the chain of infection is important and necessary.

Scabies can be treated with scabicide agents such as Gameksan, Sulfur, and Permethrin. The treatment of scabies with scabicide agents usually gives a high cure rate. However, if the treatment is solely given without accompanied by a clean and healthy living behaviors, then the recurrence of scabies infection may occur in a short time. Thus to eradicate scabies, santri need to be treated accompanied by behavioral changes.

Based on the description above, we intend to make the eradication program of scabies in pesantren with topical Permethrin agent followed by health education. In order for the health education to work successfully, survey is needed to determine the prevalence of scabies and hygienic behavior.

## Method

This cross-sectional study was conducted in a pesantren in East Jakarta, on March 8<sup>th</sup>, 2014. Informed consent was obtained from all the students, then they were given questioner to get the information of personal hygiene behavior of the subjects during the stay in the pesantren, which are:

1. Bathing habits  
1 = good (a minimal of two times a day using soap)  
0 = bad (less than two times a day)
2. Cleaning the genital area and drying with towel  
1 = good (a minimal of two times a day)  
0 = bad (less than two times a day)
3. Towel exchange  
1 = good (never exchanging towels with other santris)  
0 = bad (have at least one time exchanging towels with other santris)
4. Drying the towel under the sun light  
1 = good (drying the towel after been used twice)  
0 = bad (drying the towel after been used three times or more)
5. Changing clothes  
1 = good (a minimal of two times a day)  
0 = bad (less than two times a day)
6. Clothing exchange  
1 = good (never exchange clothes with santris)  
0 = bad (exchange clothes with santris)
7. Washing the clothes  
1 = good (washed after being worn once)  
0 = bad (more than once)
8. Ironing the clothes  
1 = good (ironed after being used once)  
0 = bad (ironed after being used more than once)
9. Drying the mattresses under the sun light  
1 = good (mattress is dried at least once a week)  
0 = bad (less than once a week)
10. Multiple santris in one mattress for sleeping  
1 = good (never)  
0 = bad (have, at least once)

The result of the questionnaire was considered good if the subject answers equal to or more than the score of 7 and poor if answers below 7.

Subjects were examined for skin lesions diagnostic of *S. scabiei* infestation. The presence of skin condition such as papules, pustules,

excoriations, hyperpigmentations and other lesions are documented. History of current complaint of nocturnal pruritus is required to be obtained as part of the diagnosis. Dermatologist made the diagnosis of scabies and subjects with positive results will be treated with permethrine cream. Data was recorded and entered using SPSS for Windows version 20 and analyzed using *chi square test*.

## Results

This research has been conducted in a pesantren, located in East Jakarta. Samples were male Islamic boarding school students (santri) and is undergoing a junior secondary school education Madrasah Tsanawiyah (MTs) and a senior secondary school Madrasah Aliyah (MA) of various ages. The total number of male santris registered in this pesantren is 135 people. However, only 119 of males santris who has undertaken this research because 19 of them were not present on the day of the data collection due to the high school exit exam. Out of 119 of malessantris, 43 of them were infested with scabies, therefore the prevalence of scabies was 36%.

Table 1 shows the location of the scabies lesion distribution on male santris. Interdigital space of the hand is the most common location of the lesion (61.9%), followed in the buttocks area (38.1%) and in the pubic (26.2%). On the other hand, the location of scrotum, armpit and lower arm are the least of the lesion location distribution among the santris (4.8%).

**Table 1. Distribution of Scabies Lesion Location on Male Students**

Lesion location	n=42	%
Interdigital space of the hand	26	61.9
Buttock	16	38.1
Pubic	22	26.2
Groins	10	23.8
Lower leg	9	21.4
Stomach	7	16.7
Peri-umbilical	7	16.7
Upper arm	5	11.9
Glans penis	4	9.5
Scrotum	2	4.8
Armpit	2	4.8
Lower arm	2	4.8

Table 2 shows the distribution of the behavioral practices questionnaire among the santris who have been diagnosed with scabies. Practices of both exchanging towels and sleeping together in

one mattress were the most common bad behavior practices to be done among the santris (85.7%). On the other hand, 88.1% of the male santris have a good behavior of taking bath twice daily with soap.

Good behavior generally found in bathing habits, buttocks drying with towel after wiping, drying towel under the sunshine, clothing exchange and ironing clothes. On the other hand, bad behavior practices are found in the habit of exchanging towels, drying carpet/mattress/mat under the sunshine, and sleeping together in one mattress.

**Table 2. The Distribution of the Score of Behavior Practices Questionnaire**

No	Questionnaire	Score	Total	%
1	Bathing habits...	0	5	11.9
		1	37	88.1
2	Cleaning the genital and buttock areas and drying with towel...	0	20	47.6
		1	22	52.4
3	Towel exchange...	0	36	85.7
		1	6	14.3
4	Drying towel under the sun light...	0	18	42.9
		1	24	57.1
5	Changing clothes...	0	21	50
		1	21	50
6	Clothing exchange	0	15	35.7
		1	27	64.3
7	Washing the clothes	0	25	59.5
		1	17	40.5
8	Ironing clothes...	0	8	19
		1	34	81
9	Drying carpet/mattress/mat under the sun light...	0	29	69
		1	13	31
10	Sleeping together in one mattress...	0	36	85.7
		1	6	14.3

Based on table 3 it is found that santris with good behavioral practices have less scabies compared to santris with bad behavioral practices. Chi-square test shows significant difference ( $p=0.008$ ) between the frequency of scabies and daily behavioral practices meaning there is a relationship between good and bad daily behavioral practices of living with the frequency of scabies in santris.

**Table 3. The Frequency of Scabies Based on Behavioral Practices**

Behavior	Scabies (-)	Scabies (+)
Good	24 (20.2%)	4 (3.4%)
Bad	53 (44.5%)	39 (32.8%)

## Discussion

Scabies is a skin disease that is closely related to the personal hygiene of each individual. This disease needs direct contact between each individual in order to spread the infection. However, it also can be transmitted through mattress, towels, clothing, and other personal items that are used interchangeably.<sup>7</sup> In order to be able to define the prevalence of scabies transmission among the students, it is necessary to identify the personal hygiene in the boarding school.

In this study, the prevalence of scabies was 36%, lower compare to the study conducted by Hilmy<sup>8</sup> in 2012 on the same boarding school (the prevalence of scabies was 93.8%) which then held a mass treatment and health education on prevention of scabies with the results of all students were recovered from scabies. Two years later, the same research is conducted again (this study) and scabies is still obtained but a lower prevalence.

Scabies is a curable disease, however, if it is not followed with good personal hygiene practices and adequate treatment, reinfection is imminent. Adequately treated patients are sometimes swiftly to get reinfection in the communities; therefore the infestation continues to circulate. Study on repeated infestation in crusted scabies showed that recurrences are likely to emerge due to untreated contacts and inadequate treatment, even given three fortnightly doses of ivermectin, scabies presents again after 6-12 months.<sup>9,10</sup>

Thus, mass treatment should be followed by good hygiene practices in order to stop the recurrence of scabies.

## The Relationship between Scabies Frequency and Personal Hygiene

This study shows that there is a relationship between personal hygiene practices towards scabies infestation among the santris. As described in WHO, scabies spreads principally by direct skin contact and/or contact with infested garments and bedclothes.<sup>11</sup> Scabies is more prevalent in santris with bad personal hygiene and vice versa. Santris who have answered equal or more than the score

of 7 is considered to have good personal hygiene and it works the other way around. The higher the score, the better personal hygiene. Most of the questionnaires are composed to the context of sharing personal belongings and sanitary. The infestation of scabies is vulnerable in overcrowded condition, especially with those who have the practices to share their personal belongings between each other with infected garments. In 2009, a study was conducted in Iraq stated that the prevalence of scabies was high in crowded living condition, prisons (83.3% of cases), and among high-risk group, children (31.1% of cases).<sup>12</sup>

Based on the analytical descriptive of this study, it is found that 28 subjects (23.6%) have good hygienic practices, with only 4 of them infected with scabies. On the contrary, 91 subjects (76.4%) have poor hygienic practices, and 38 of them are infected with scabies. Using chi-square test, it is found that there is a relationship between hygienic practices towards scabies infestation among the male santris, with  $p\text{-value} < 0.5$ . This finding is consistent with a study in 2004 in the sub-district health centers Gemuh in Kendal, stating that there is a relationship between the incidences of scabies personal hygiene.<sup>13</sup> In addition, a study was conducted in a boarding school in Lamongan stated that poor personal hygiene contributes to 73.70% of scabies prevalence.<sup>14</sup> Improvement of healthy personal hygiene practices also gives an effect in reducing the prevalence of scabies in 4 Islamic religious schools in Bangladesh.<sup>15</sup>

## The Location of Lesion Distribution

The manifestation of scabies are pustules, papules, vesicles, and secondary lesions. On this study, the most common location of the lesion among the male santris ranging from the first until the third rank are in the interdigital space of the hand, buttocks, and pubic. This result is in accordance with the literature finding stated that the areas mainly affected are within thin stratum corneum layer, e.g. interdigital space.<sup>16</sup> Another common location of lesion are mostly buttocks, pubic, flexor surface of the wrists, extensor surface of the elbows, and genitalia.<sup>10</sup> This corresponds to a study conducted by Sungkar et al,<sup>17</sup> which showed that interdigital space and buttock are the most common location for the lesion to occur. Because in interdigital space of the fingers contain thin layer of stratum corneum, it gives the highest number of lesion distribution compared to other locations and the mites are easily to cause such a condition. Based on the location, the santris are suffering from classic type of scabies,



where the main complaint of nocturnal itchiness that results of sleeping disturbance during the night.<sup>9</sup> On the contrary, the least number of lesion distribution are in the axilla, lower arm, and scrotum. The longer the duration of acquiring scabies, the lesion will be more spread according to the severity, e.g. axilla.<sup>12</sup>

### **Distribution of Behavioral Practices**

Based on this study, practices of exchanging towels and sleeping together in one mattress are the most common practices to be done among the santri. Scabies is infected through direct skin-to-skin contact and not to forget through contact with infected objects. The parasite can be attached to the personal belongings of the infected subjects, such as towels, clothing, and mattress. Because there is a relationship between personal hygienic practices towards the scabies manifestation, it is can be concluded that the usage of personal belongings interchangeably between infected and non-infected subjects is a clear route of infection between individual. Although the santri have good personal hygiene of less sharing clothes between each other, the practices of sharing towel is still high, which results of scabies infestation. Drying the personal belongings under sunlight is also common among the santri and gives positive results of minimizing the transmission of the disease. A study in a pesantren in North Sumatra stated that improved in the practice of healthy hygiene, such as daily bathing, routine clothes changing, drying towels under the sunlight, changing bed sheets, minimizing clothes sharing, and avoiding sleeping in one bed minimize scabies infection.<sup>18</sup> At poor hygienic practices, the transmission of scabies is easier to occur. Habits such as hand washing, bathing with soap, changing clothes and underwear, not exchanging clothes and daily appliances may reduce the risk of scabies.

### **Conclusions**

The prevalence of scabies in Pesantren X among the male santri was 36%. Most of the santri have good behavior, but the percentage of sleeping in one mattress is still high among the santri. There is an association between personal hygiene and scabies infestation in Pesantren X. Clean and healthy lifestyle education should be repeated quarterly in each class to refresh the memory of the students regarding the urgency to prevent scabies.

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