

The Relationship of Personal Hygiene and Physical Environmental Conditions with Scabies Symptoms

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Article Information

Submitted: 16 October
2023

Accepted: 20 October 2023

Online Publish: 20

November 2023

Abstract

Introduction: Scabies is a contagious skin disease caused by the female tick *Sarcoptes Scabiei Varieta Hominis* which belongs to the Arachnida group. **Objective:** The purpose of this study was to determine the relationship between personal hygiene and environmental conditions with scabies symptoms at Al-Mubarak Islamic Boarding School in Jambi City. **Method:** This study used an analytical observational method with a Cross Sectional approach, the sample in this study were 85 respondents using simple random sampling. **Result and Discussion:** The results of this study showed a significant relationship between skin and hand hygiene ($p = 0.001$), towel hygiene ($p = 0.033$) with scabies symptoms. There is no relationship between clothing hygiene ($p = 0.109$) with scabies symptoms. Proportion of physical environmental conditions (clean water facilities, ventilation, occupancy density, humidity) that do not meet requirements 100%. **Conclusion:** Variables associated with scabies symptoms are skin and hand hygiene, and towel hygiene. Variables that are not associated with scabies symptoms are clothing hygiene. It is recommended to the boarding school to add exhaust fans and also pay attention to the clean water facilities used and the students to maintain personal hygiene such as routine bathing 2x a day, drying clothes and towels in the sun.

Keywords: Scabies Symptoms; Personal Hygiene; Physical Environmental Conditions;

Introduction

Skin disease is a disease that is often found in the community, this disease can attack a person if someone has a poor immune level. Skin diseases can be caused by fungi, bacteria, fungi, parasites, and viruses (Gusni, Putra, & Bayhakki, 2021). One type of skin disease is scabies. Scabies are an infectious skin disease caused by female lice *Sarcoptes Scabiei Varieta Hominis* who enter on the group *Arachnida* (Parman, Hamdani, Rachman, & Pratama, 2017). Scabies can cause suffering, because the patient can not fall asleep comfortably at night because of itching (Ridwan, Sahrudin, & Ibrahim, 2017). Scabies is also a common disease in developing countries, according to *World Health Organization* (WHO) by 2020, scabies is estimated to affect more than 200 million people worldwide at any one time ("World Health Organization. Scabies [Internet]. World Health Organization. 2020. Available from: <https://www.who.int/news-room/fact-sheets/detail/scabies>," 2020)

By *International Alliance for the Control of Scabies* (IACS) by 2020, around 150-200 million people worldwide will be affected by scabies with suspected 455 million cases per year (Tahani & Risnawati, 2022). The prevalence of scabies is latest literature according to *World Health Organization* (WHO) ranges from 0.2% to 71%, ("World Health Organization. Scabies [Internet]. World Health Organization. 2020. Available from: <https://www.who.int/news-room/fact-sheets/detail/scabies>," 2020) while according to *International Alliance for the Control of Scabies* (IACS) the incidence rate of scabies in the latest literature ranges from 0.3 to 46%. (Oktaviana & Azizah, 2021)

In some countries, scabies cases vary, for example in Brazil and South America can reach 18%, in Benin in West Africa 28.33%, for the city of Enugu in Nigeria 13.55%, and Penang in Malaysia 31% (Winandar & Muhammad, 2021). The prevalence of scabies in Indonesia according to data from the Ministry of Health has decreased from year to year, this can be seen from prevalence data of 5.60%-12.96% in 2018 and prevalence of 4.9 to 12.95% in 2019.

The latest data recorded for the prevalence of scabies in Indonesia in 2020 is 3.9 to 6% ("Depkes RI. 2020. Keputusan Menteri Kesehatan Republik Indonesia Nomor: Hk.01.07/Menkes/104/2020 Tentang Sebagai Penyakit Yang Dapat Menimbulkan Wabah dan Upaya Penanggulangannya. Jakarta 2020," 2020). Although the prevalence of scabies in Indonesia is shrinking every year, scabies is still ranked 3rd among the most common skin diseases in Indonesia (Oktaviana & Azizah, 2021)

In 2017, scabies and other ectoparasites were classified as Neglected Tropical Diseases (NTDs) (Faidah & Saputro, 2022). Scabies is often underestimated because it is considered not life-threatening so that the priority of treatment. Starting from its pathology, scabies is a severe chronic disease, and can cause dangerous complications, namely bacterial scunder infections such as species *Streptococcus* and *Staphylococcus aureus* (Rahmawati, Hestningsih, Wuryanto, & Martini, 2021)

Scabies can attack people who lack personal hygiene such as lack of maintaining hand and nail hygiene, clothing hygiene, towel hygiene, and others. In addition, it can attack in densely populated places and lack environmental sanitation such as inadequate

clean water, unqualified ventilation. Scabies can be found in dormitories, prisons, orphanages, and also Islamic boarding schools (Saragih, 2021)

This disease is often said to be the disease of boarding school children because boarding school children like to exchange and borrow clothes, towels, sarongs, pillows, bolsters, and mattresses to their friends so as to facilitate the transmission of diseases between students. Islamic boarding schools are an important subject in the problem of scabies, the cause of which is because they live together with a group of people for a long time (Ridwan et al., 2017)

Based on data from the Jambi City Health Office in 2021, there were 2,455 scabies cases in Jambi City with the highest cases at the Tahtul Yemen Health Center in 2019 with 391 cases, then in 2020 it decreased to 378 cases, and in 2021 it increased to 467 cases. In the working area of the Tahtul Yemen Health Center, there are 5 Islamic boarding schools including Sa'adatuddaren, Al-Jauharen, Ma'had Al-Mubarak, Darul Muhtadin, and TQ Arriyad ("Dinas Kesehatan Kota Jambi. Profil Dinas Kesehatan Kota Jambi. Dinas Kesehatan Kota; 2021.,” 2021) ("Puskesmas Tahtul Yaman. Profil Kesehatan Puskesmas Tahtul Yaman. 2021.,” 2021)

Based on initial observations and interviews with 5 students, it was found that 3 out of 5 students experienced itching and spots on the elbows and between fingers that were similar to scabies symptoms, because *personal hygiene* in students had not been fully implemented because the students were still borrowing clothes, towels that were dried in the sun indirectly under direct sun. In addition, initial observations also showed that the students slept together, bathed together, and also inadequate clean water facilities.

Method

This study used analytical observational method with *Cross Sectional approach*. This research was carried out at the Al-Mubarak Islamic Boarding School in Jambi City and was carried out from July to August 2023. The population of this study was all female students at the Al-Mubarak Islamic Boarding School in Jambi City as many as 381 people. The sample in this study amounted to 85 people with a sampling technique, namely *simple random sampling*. The data analysis used was univariate and bivariate analysis with *chi-square test* and using the help of IBM SPSS version 23.

The data obtained were collected using a questionnaire containing a collection of questions that must be asked to the respondents to determine the relationship between research variables, and digital cameras were used to document respondents' activities when filling out the questionnaire.

Result and Discussion

Result

Univariate Analysis

Table 1
Frequency distribution based on research variables

Variable	Frequency (n)	Percentage (%)
Symptoms of Skabies		
Symptoms of Skabies	49	57,6
No Symptoms of Skabies	36	42,4
Skin and Hand Hygiene		
Not Good	40	47,1
Good	45	52,9
Clothing Hygiene		
Not Good	23	27,1
Good	62	72,9
Towel Hygiene		
Not Good	41	48,2
Good	44	51,8
Total	85	100

Based on the data obtained from table 1 showed that the most frequent scabies symptoms were 49 (57.6%) respondents, while those who did not experience scabies symptoms were 36 (42.4%) respondents. The results of the analysis of the variable of poor skin and hand hygiene were 40 (47.1%) respondents while respondents with good skin and hand hygiene were 45 (52.9%) respondents. The variables of poor clothing hygiene were 23 (27.1%) respondents and good clothing hygiene was 62 (72.9%) respondents. The variables of poor towel hygiene were 41 (48.2%) respondents and good towel hygiene was 44 (51.8%) respondents.

Bivariate Analysis

Table 2
The Relationship between Personal Hygiene and Physical Environmental Conditions

Variable	Symptoms of Skabies				Total		<i>p-value</i>	PR (95%CI)
	Symptoms of Skabies		No Symptoms of Skabies					
	n	%	n	%	N	%		
Skin and Hand Hygiene								
Not Good	31	77,5	9	22,5	40	100	0,001	1,93 (1,30, 2,87)
Good	18	40,0	27	60,0	45	100		
Clothing Hygiene								
Not Good	17	73,9	6	26,1	23	100	0,109	1,43 (1,01- 2,01)
Good	32	51,6	30	48,4	62	100		
Towel Hygiene								
Not Good	29	70,7	12	12	41	100	0,033	1,55 (1,06 – 2,27)
Good	20	45.5	24	24	44	100		

Based on data obtained from table 2, it shows that students who have scabies symptoms are more in the group of students who have poor skin and hand hygiene by 77.5% than the group of students who have good skin and hand hygiene by 40.0%. From the results of bivariate analysis, poor skin and hand hygiene had a risk of 1.93 times the risk of scabies symptoms compared to good skin and hand hygiene (PR = 1.93, 95%, CI 1.30-2.87), and was shown to be statistically significant $p\text{-value} < 0.005$ (0.001).

The clothing hygiene variable showed that students who had scabies symptoms were more in the student group who had poor clothing hygiene by 73.9% than the student group who had good clothing hygiene by 51.6%. From the results of bivariate analysis, it was found that good clothing hygiene had a chance of 1.43, not as a risk factor for scabies symptoms compared to poor clothing hygiene (PR = 1.43, 95%, CI 1.01-2.01), and proved not statistically significant, $p\text{-value} > 0.005$ (0.109). The variables showed that students who had more symptoms of scabies in the group of students who had poor towel hygiene by 70.7% compared to the group of students who had good towel hygiene by 45.5%.

From the results of bivariate analysis, poor towel hygiene was found to have a risk of 1.55 times the risk of scabies symptoms compared to good towel hygiene (PR = 1.55, 95%, CI 1.06-2.27), and was shown to be statistically significant, $p\text{-value} < 0.005$ (0.033).

Discussion

1. Description of Scabies Symptoms at Al-Mubarak Islamic Boarding School Jambi City

Based on the results of univariate analysis, the frequency distribution was found that out of 85 respondents as many as 49 (57.6%) respondents experienced scabies symptoms and 36 (42.4%) people did not experience scabies symptoms. The results of this study showed that most respondents who had more scabies symptoms than those who did not have scabies symptoms.

From the results of interviews and the distribution of research questions about scabies symptoms, there were 52 (61.2%) students found prominent red spots on the skin, as many as 49 (57.6%) students often scratched the red spots, as many as 50 (58.8%) students experienced red spots arising on the hands, elbows, armpits, between fingers, and as many as 32 (37.6%) Students experience insomnia at night because of itching in red spots

Scabies is an infectious infectious disease caused by female ticks *Sarcoptes Scabiei Varieta Hominis* (Parman et al., 2017). Scabies causes complaints such as itching in parts of the skin such as between fingers, between toes, groin, thigh folds, abdominal folds, armpits, and vital areas. Scabies can be caused by several factors, including poor environmental conditions and not supported by good personal hygiene will trigger the development of scabies (Zuheri & SRG, 2021)

2. Skin and Hand Hygiene Relationship at Al-Mubarak Islamic Boarding School Jambi City

Based on the results of the study showed that there is a relationship between skin and hand hygiene with scabies symptoms at Al-Mubarak Islamic Boarding School Jambi City.

Skin health is important to pay attention to because the skin is the most important organ that reflects health and life. Skin is one type of tissue that is not too much attention by most people until problems such as skin diseases arise. Skin in humans has a very important role, in addition to its main function to ensure survival, also has other meanings such as race, and is a means of non-verbal communication between individuals.

This research is in line with research conducted by Novitasari, *et al* (2021) that there is a relationship between skin, hand and nail hygiene with values $p\text{-value} = 0.00$ (Novitasari et al., 2021). Furthermore, continued with research conducted by Gultom, *et al* (2022) obtained value $p\text{-value}$ 0,000 so that there is a relationship between skin hygiene and skabies disease with OR = 5.2 which if it does not meet skin hygiene then it will have a 5x risk of developing skabies, as well as there is a relationship of hand and nail hygiene with the value $p\text{-value}$ 0.001 with OR = 4.3 which means respondents who do not meet hand and nail hygiene will have a 3x risk of developing scabies (Gultom & Indarwati, 2022)

Some students still do not apply good skin and hand hygiene, such as there are still those who do not wash their hands after activities, do not wash their hands before eating, do not routinely cut their nails so that they can become a place for bacteria to develop.

3. Relationship of Clothing Hygiene at Al-Mubarak Islamic Boarding School Jambi City

Based on the results of the study showed that there was no relationship between clothing hygiene and scabies symptoms at Al-Mubarak Islamic Boarding School Jambi City.

Clothing has the function of protecting the body from the influence of the external environment. Cleanliness of clothes will affect the cleanliness and health of the skin, if we maintain the cleanliness of the skin that we maintain then the disease will stay away. Keeping clothes clean can be done by washing using detergent, drying in the sun, and ironing to kill bacteria attached to clothes.

This is in line with research conducted by Aulia, *et al* (2022) that there is no significant relationship between clothing hygiene and the incidence of scabies with grades $p\text{-value} = 0.458$ (Aulia, Wijayantono, & Awaluddin, 2022). In line with research conducted by Zuheri, *et al* (2021) that there is value $p\text{-value} = 0.824$ so there is no relationship between clothing hygiene and the incidence of scabies (Zuheri & SRG, 2021).

There is no relationship between the cleanliness of clothes and symptoms of scabies because the students have maintained the cleanliness of clothes by washing clothes using detergent, drying clothes in the sun. However, there are still bad behaviors such as borrowing or exchanging clothes with friends.

4. Towel Hygiene Relationship at Al-Mubarak Islamic Boarding School Jambi City

Based on the results of the study, it shows that there is a relationship between the cleanliness of towels at the Al-Mubarak Islamic Boarding School in Jambi City.

Towels play an important role in the transmission of scabies disease through indirect contact, thus affecting the transmission route of scabies. Not keeping towels clean properly will put a person at risk of developing scabies (Rahmawati et al., 2021).

The towel used should be clean and not damp, how to maintain the cleanliness of the towel can be by drying the towel immediately after use, washing the towel every 1 week, changing the towel periodically 1-2 times a week, and drying the towel in the sun (Novitasari et al., 2021).

In line with research conducted by Parman, *et al* (2017) there is a value *p-value* = 0.000 so that there is a significant relationship between towel hygiene and the incidence of scabies (Parman et al., 2017). Furthermore, in line with research conducted by Novitasari, *et al* (2021) that there is a significant relationship between towel hygiene and the incidence of scabies with value *p-value* = 0.006 (Novitasari et al., 2021). Some students still do not dry towels directly under the sun and only dry indoors so that towels are still damp to use, do not wash towels 1 time a week and do not change towels regularly.

5. Overview of Clean Water Facilities at Al-Mubarak Islamic Boarding School Jambi City

Physical clean water according to the Decree of the Minister of Health of the Republic of Indonesia No. 907/Menkes/SK/VII/2002 is cloudless, colorless, odorless, and tasteless. Water is very important for humans because it plays a lot of role in everyday life. Clean water is widely used for daily purposes such as drinking, cooking, bathing, and others. Water that is polluted both physically, chemically, biologically, and microbiologically, if drunk can cause disease or health problems. Diseases or health problems that can arise due to polluted water can be divided into two groups, namely infectious diseases and non-communicable diseases (Marlinae, Khairiyati, Rahman, & Laily, 2019)

Research conducted by Tajudin, *et al* (2023) that there is a relationship between water cleanliness and the incidence of scabies with values *p-value* = 0.016 (Tajudin, Wardani, Hapsari, & Katmawanti, 2023). In line with research conducted by Husna, *et al* (2023) with values *p-value* = 0.000 which means there is a relationship between the cleanliness of clean water facilities and the incidence of scabies (Husna, Asriwati, & Maryanti, 2023). Based on observations at the Al-Mubarak Islamic Boarding School in Jambi City about clean water facilities still do not meet the requirements, physically the water used is turbid, colored, smelly, and tasteful, because the results of interviews that have been carried out water sources used come from the Batanghari River which are taken directly without filtration, the water is used for daily needs such as bathing, washing dishes, baskets, and also used for ablution and there are sand deposits in the bathtub.

6. Overview of Ventilation at Al-Mubarak Islamic Boarding School Jambi City

According to the Decree of the Minister of Health of the Republic of Indonesia No. 829 / Menkes / SK / VII / 1999 concerning the qualified ventilation area is 10%. Ventilation is the process of providing air in certain parts of a room naturally and mechanically. The ventilation area is important because it ensures the quality of air circulation in and out of the room. Inadequate room ventilation can result in insufficient fresh air entering the house and dirty air that comes out is not optimal (Rini, 2019)

Based on research conducted by Ibadurrahmi, *et al* (2016) there is a value *p-value* = 0.029 so that there is a significant relationship between ventilation and the incidence of scabies (Ibadurrahmi, Veronica, & Nugrohowati, 2016). In line with research conducted by Lilia, *et al* (2022) with values *p-value* = 0.000 so there is a significant relationship between ventilation and the incidence of scabies (Lilia & Novitry, 2022)

Based on the results of observations made at the Al-Mubarak Islamic Boarding School in Jambi City with measurements using a *roll meter*, it was found that the size of the ventilation area was 2.1%, which means that the ventilation area does not meet the requirements because the ventilation is only on one side, and the number of vents does not match the area of the room. This limitation of ventilation results in a lack of sunlight entering the room, which in turn can cause the growth of disease-causing pathogenic bacteria including scabies.

7. Overview of Residential Density at Al-Mubarak Islamic Boarding School Jambi City

Unqualified occupancy density can have a negative impact on the health of residents of the house and the surrounding environment, this is due to limited and not wide space that facilitates the spread of disease from one person to another. The requirements for occupancy density according to the Decree of the Minister of Health of the Republic of Indonesia No. 829 / Menkes / SK / VII / 1999 the area of the bedroom is at least 8m² and it is not recommended 2 people in one bedroom.

Based on research conducted by Gultom, *et al* (2022) there is a relationship between occupancy density and the incidence of scabies with a value of 0.004 with OR = 3.782 which means that respondents living in unqualified occupancy densities are 4 times more at risk of developing scabies compared to respondents living with eligible occupancy densities (Gultom & Indarwati, 2022). In line with research conducted by Ibadurrahmi, *et al* (2016) There is a relationship between the density of hunian and the occurrence of skabies and the value *p-value* = 0.007 (Ibadurrahmi et al., 2016)

Based on observations at the Al-Mubarak Islamic Boarding School in Jambi City with a room measuring 20x20m which is used for sleep and rest for 115 students so that they are not eligible because they sleep using mats together so that there is no distance with a long enough time to facilitate disease transmission. Occupancy density is one of the causes of the high incidence of scabies or other infectious diseases because occupancy density can affect indoor air quality, the more occupants, the faster the indoor air is polluted (Handari & Yamin, 2018)

8. Overview of Humidity at Al-Mubarak Islamic Boarding School Jambi City

A damp room with wet walls will make it uncomfortable and can interfere with health. Indoor humidity will facilitate the proliferation of bacteria. According to the Decree of the Minister of Health of the Republic of Indonesia No. 829 / Menkes / SK / VII / 1999 the required air humidity ranges from 40%-70%.

Poor humidity can be caused by several factors, such as poor home construction, leaky roofs, leaky floors and walls, and lack of natural or artificial lighting. The higher the humidity, the higher the survival rate of mites.(Handari & Yamin, 2018)

Based on research conducted by Ibadurrahmi, *et al* (2016) with values *p-value* = 0.029 until the results have a slowdown relationship with the occurrence of skabies (Ibadurrahmi et al., 2016). In line with research conducted by Gultom, *et al* (2022) there is a slowdown relationship with the occurrence of skabies with values *p-value* = 0.029 (Gultom & Indarwati, 2022)

Humidity levels that are not in accordance with the requirements can trigger the transmission of environment-based diseases such as scabies, such as irregular placement of goods, clothes, towels that are not neatly arranged, and occupancy density (Hasibuan, 2022).

In the observations at Al-Mubarak Islamic Boarding School, the humidity value in the room was 71% so that it does not qualify because of the damp condition of the roof, as well as piled items such as pillows, hanging clothes, mukenah hanging in stacks and also the density of occupancy in one room.

Conclusion

Based on this study, it can be concluded that there is a relationship between skin and hand hygiene, and towel hygiene with scabies symptoms. There was no association between clothing hygiene and scabies symptoms. The proportion of the state of the physical environment (clean water facilities, ventilation, occupancy density, humidity) that does not meet the requirements of 100%).

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