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Assessment of Knowledge and Personal Hygiene Practices Regarding Scabies Among High-risk Students in a Non-formal Education Boarding School

Uyuzun Önlenmesinde Bilgi ve Kişisel Hijyen Uygulamaları: Gayri Resmi Yatılı Okuldaki Yüksek Riskli Öğrenciler Üzerine Kesitsel Bir Çalışma

Sri Wahdini[1], Ika Puspa Sari[2], Fajaria Nurcandra[3], Saleha Sungkar[2]

[1]Doctoral Program of Biomedical Science, Universitas Indonesia Faculty of Medicine, Jakarta, Indonesia
[2]Department of Parasitology, Universitas Indonesia Faculty of Medicine, Jakarta, Indonesia
[3]Public Health, Faculty of Health Science, Universitas Pembangunan Nasional Veteran Jakarta, Depok Jawa Barat, Indonesia

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ABSTRACT

Objective: Scabies is a common skin disease, especially prevalent in densely populated environments such as a boarding school. This study assesses knowledge and practices related to scabies among students in a non-formal education boarding school.
Methods: This cross-sectional study was conducted in a non-formal boarding school X in South Jakarta, Indonesia, in December 2023. The population was all male students (127 respondents) who were recruited using consecutive sampling. Data were collected through a semi-structured and self-administered questionnaire to assess students' knowledge and personal hygiene practices. The collected data were analyzed descriptively using SPSS version 20.
Results: The respondents' levels of knowledge were categorized as follows: 59.1% had good knowledge, 34.6% had moderate knowledge, and 6.3% showed poor knowledge. However, their hygiene practices indicated a different trend, with only 22% exhibiting good practices, 72.4% showing moderate practices, and 5.5% demonstrating poor practices. Most respondents (88.2%) were unaware of the etiology of scabies. Regarding personal hygiene practices for preventing scabies, 78% used personal towels, and 74.8% slept on their own mattresses. Yet, only 18.9% maintained the cleanliness of their bed linens.
Conclusion: While most respondents demonstrated good knowledge about scabies, their hygiene practices were generally at a moderate level. To address this gap, knowledge and behavior can be enhanced through regular health education, the provision of adequate facilities, and the enforcement of internal regulations to foster better student discipline.
Keywords: Scabies, boarding school, knowledge, hygiene practic

ÖZ

Amaç: Uyuz, özellikle yatılı okul gibi yoğun nüfuslu ortamlarda yaygın olarak görülen bir deri hastalığıdır. Bu çalışma, yatılı bir gayri resmi eğitim kurumundaki öğrencilerin uyuz hakkındaki bilgi ve uygulamalarını değerlendirmektedir.
Yöntemler: Bu kesitsel çalışma, Aralık 2023'te Endonezya'nın Güney Jakarta'daki yatılı bir gayri resmi okul olan X'te gerçekleştirilmiştir. Çalışma popülasyonu, ardışık örnekleme yöntemiyle seçilen 127 erkek öğrenciden oluşmaktadır. Öğrencilerin bilgilerini ve kişisel hijyen uygulamalarını değerlendirmek için yarı yapılandırılmış ve kendileri tarafından doldurulan bir anket kullanılarak veri toplanmıştır. Toplanan veriler, SPSS sürüm 20 kullanılarak tanımlayıcı olarak analiz edilmiştir.
Bulgular: Katılımcıların bilgi düzeyleri şu şekilde kategorize edilmiştir: %59,1'i iyi bilgi düzeyine sahipken, %34,6'sı orta düzeyde bilgiye sahip ve %6,3'ü düşük bilgi düzeyinde bulunmuştur. Ancak, kişisel hijyen uygulamaları farklı bir eğilim göstermiştir; yalnızca %22 iyi uygulamalar sergilerken, %72,4 orta düzeyde uygulamalar göstermiş ve %5,5 düşük düzeyde uygulamalara sahiptir. Katılımcıların çoğu (%88,2) uyuzun etiyolojisini bilmiyordu. Uyuz önleme için kişisel hijyen uygulamalarına bakıldığında, %78'i kişisel havlu kullanmış, %74,8'i kendi yataklarında uyumuş, ancak yalnızca %18,9'u çarşaf temizliğini sağlamıştır.
Sonuç: Katılımcıların çoğu uyuz hakkında iyi bilgiye sahip olmasına rağmen, kişisel hijyen uygulamaları genellikle orta düzeydedir. Bu boşluğu gidermek için, düzenli sağlık eğitimi, uygun tesislerin sağlanması ve öğrencilerin disiplinini artırmak adına iç düzenlemelerin uygulanması yoluyla bilgi ve davranış geliştirilebilir.
Anahtar Kelimeler: Uyuz, yatılı okul, bilgi, hijyen uygulamaları

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Address for Correspondence/Yazar Adresi: Saleha Sungkar, Department of Parasitology, Universitas Indonesia Faculty of Medicine, Jakarta, Indonesia
E-mail/E-Posta: saleha.sungkar@ui.ac.id **ORCID ID:** orcid.org/0000-0002-6570-8793

Türkiye PARAZİTOLOJİ Dergisi

INTRODUCTION

Sarcoptes scabiei is an ectoparasite triggering the occurrence of scabies, a skin disease designated by the World Health Organization as a neglected tropical disease (NTD) targeted for elimination by 2030 (1). In Indonesia, scabies is classified as one of the 13 NTDs and is still endemic (2), posing a significant public health challenge in densely populated environments such as boarding schools, orphanages, nursing homes, prisons, refugee camps, and daycare centres. High population density increases physical and non-physical contact between people, facilitating the transmission and infestation of scabies mites. Other factors contributing to scabies incidence include socioeconomics, knowledge about scabies, personal hygiene practices, and infrastructure availability (3). A study among university graduates in Saudi Arabia found a generally good level of knowledge about scabies, yet only 22.1% could correctly identify its signs and symptoms (4). In contrast, a study of Syrian refugees revealed inadequate knowledge about the disease (5).

The prevalence of scabies in boarding schools has been reported to range from 36.8% to 76.9% (6-8), primarily in Islamic boarding schools (pesantren), which are integral to Indonesia's national education system. These non-formal institutions often design curricula and learning methods tailored to specific needs, contributing significantly to the development of Islamic religious education. However, many pesantren face challenges related to limited facilities, infrastructure, and hygiene standards among administrators and students, increasing vulnerability to infectious diseases like scabies (9). Wahdini et al. (10) identified parasitic diseases, including blastocystosis, giardiasis, enterobiosis, scabies, and head lice, among certain groups of students. Risk factors for high scabies incidence include shared clothing, joint sleeping arrangements, repeated use of dirty clothes, insufficient washing, and inadequate bedding materials and room space (6-8).

Scabies is characterized by a high cure rate. Sungkar et al. (11) reported a 95.7% cure rate using the standard treatment method (whole-body topical application of permethrin) and a 91.3% cure rate with modified treatment (lesion-only permethrin application combined with soap usage) by the third week. However, reinfection is common, emphasizing the need for a comprehensive understanding of vulnerable populations' knowledge and behavior to inform effective intervention strategies. This study aims to assess the knowledge and hygiene practices related to scabies transmission among students in non-formal Islamic boarding schools.

METHODS

The research employed a descriptive survey method with a cross-sectional approach. This study was conducted among male students in a non-formal education boarding school (Islamic boarding school or Pesantren X) in South Jakarta, Indonesia, in December 2023. The research employed a descriptive survey method with a cross-sectional approach. Sampling was carried out using a consecutive (non-random) sampling method.

The inclusion criteria included all students actively attending classes, residing in the school dormitory, and voluntarily agreeing to complete the provided questionnaires. Incomplete questionnaires were excluded from the analysis. The Ethics Committee of the Faculty of Medicine, Universitas Indonesia, approved the study under protocol number 21-11-1921, date: 09.11.2023.

Before the study began, all respondents were informed about its purpose. Written consent was obtained from participants aged 18 and above, who retained the right to decline participation. For respondents under 18 years old, consent was provided by their parents after a comprehensive explanation of the study procedures. Only those who consented to participate were included in the study.

The questionnaire, adapted from a study by Yusof et al. (12), was divided into two sections. The first section consisted of ten multiple-choice questions assessing knowledge about scabies, each with one correct answer. A score of one point was awarded for each correct response, while incorrect answers or "don't know" responses received zero points, making the maximum achievable score 10.

The second section of the questionnaire comprised 20 statements assessing personal hygiene practices related to scabies risk factors, with yes or no answer options. One point was assigned for each good personal hygiene practice, while poor practices received zero points. Statements 11, 13, 15, and 18 were reverse questions, requiring responses to be interpreted inversely. The total score for each part was calculated, with scores above 74% categorized as good, 40-74% as moderate, and below 40% as poor.

Statistical Analysis

The data were analyzed using the SPSS statistical package for Windows version 20.0 (IBM Corp., Armonk, NY). Descriptive statistics were employed to summarize the key features of the data, presenting results as frequencies and percentages in tables or figures.

RESULTS

A total of 127 male students from a non-formal education boarding school participated in this study (Table 1). Most respondents (55.1%) were young adults aged 18-24, and 59.1% had previously received information about scabies.

Table 1. Characteristics of respondents (n=127)

Characteristics	n	%
Age		
Early adolescence (10-13 years old)	7	5.5
Middle adolescence (14-17 years old)	43	33.9
Late adolescent or young adult (18-24 years old)	70	55.1
Adult (>24 years old)	7	5.5
Last education		
Elementary	28	22.0
Junior high school	24	18.9
Senior high school	29	22.8
Bachelor degree	5	3.9
Non-formal/not in school	41	32.3
Information about scabies before		
Yes	75	59.1
No	52	40.9

Among the participants, 59.1% demonstrated good knowledge, 34.6% had moderate knowledge, and 6.3% showed poor knowledge. However, personal hygiene practices displayed a different pattern, with only 22% of respondents exhibiting good practices, 72.4% showing moderate practices, and 5.5% demonstrating poor practices (Figure 1).

Regarding knowledge, most respondents gave correct answers related to clinical symptoms, treatment, and prevention of scabies. However, only 30 respondents (11.8%) correctly answered questions about the etiology of scabies. Additionally, 38.6% were unaware of how the disease is transmitted, and 31.5% did not know the specific areas of the skin that may present abnormalities (Table 2). Nevertheless, most participants correctly identified the body parts affected by scabies, its signs, major symptoms, susceptible populations, the risk of transmission, the treatability of scabies, preventive measures, and the need for quarantine for scabies patients.

The questionnaires on personal hygiene practices revealed several behaviors requiring improvement. These included bathing after exercise or profuse sweating (35.4%), washing towels weekly (31.5%), drying mattresses or bedding at least once a month (44.9%), changing or washing bed linens weekly (18.9%), and washing clothes after a single use (33.1%). On a positive note, the majority of respondents refrained from exchanging clothes with friends (66.9%) and frequently washed their hands with soap and running water before eating (59.8%) and after using the toilet (67.7%). Furthermore, all respondents are encouraged to maintain good practices, such as avoiding the use of shared or alternating towels (Table 3).

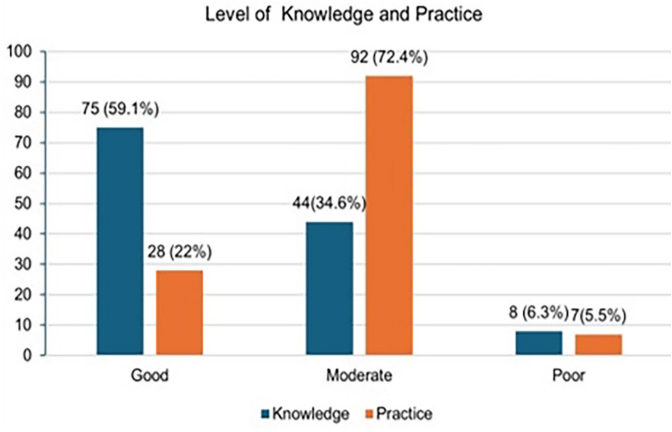

Figure 1. Level of knowledge on scabies and personal hygiene practice

DISCUSSION

Scabies transmission occurs through direct and indirect contact, highlighting personal hygiene as the key preventive measure. Direct contact involves the skin of a healthy individual coming into contact with someone infested with mites. In contrast, indirect contact occurs when the skin touches items belonging to a patient, such as mattresses, towels, clothing, or other personal items shared interchangeably. Mites can survive outside the human skin for several days, making contaminated objects or belongings intermediaries for parasite transfer (13). Conducting a study on knowledge and personal hygiene practices is crucial to support scabies eradication and prevention programs in specific communities, with potential applications to other similar populations.

A non-formal education boarding school is an environment where students study and live in the dormitory area. Male respondents who lived in dormitories were selected in this study to minimize bias, as knowledge and personal hygiene practices can be influenced by factors such as gender, residential environment, family educational and occupational status, and economic level (4). By focusing on students from an area with limited access to information, specifically Islamic boarding schools (pesantren) with restricted device use and social media access, this study gathered uniform and specific data to aid the development of targeted intervention programs. Ararsa et al. (14) reported that male students often engage in more physically demanding activities, resulting in excessive sweating and increased physical contact, such as playing sports or field activities. Consequently, hygiene practices tailored to male students' needs differ from those of female students.

The respondents demonstrated a good level of knowledge about scabies, as reflected in the analysis of their responses to each question. Most participants provided correct answers; however, only 11.8% correctly identified the etiology of scabies when given

Table 2. Knowledge of respondents regarding scabies

Questions about knowledge	Right answer		Wrong answer	
	n	%	n	%
What is the cause (etiology) of scabies?	15	11.8	112	88.2
Which body parts are commonly affected by scabies?	87	68.5	40	31.5
What are the signs of scabies?	116	91.3	11	8.7
What are the primary symptoms of scabies?	109	85.8	18	14.2
Who is at risk of being infected with scabies?	117	92.1	10	7.9
How is scabies transmitted?	78	61.4	49	38.6
Which behavior can increase the risk of scabies transmission?	118	92.9	9	7.1
What is the recommended treatment for scabies?	100	78.7	27	21.3
What measures can be taken to prevent scabies?	100	78.7	27	21.3
What steps should be taken to care for a person infected with scabies?	92	72.4	35	27.6

Table 3. Personal hygiene practices

Personal hygiene practices	Yes		No	
	n	%	n	%
Bathe regularly, at least once a day	91	71.7	36	28.3
Use soap routinely while bathing	98	77.2	29	22.8
Bathe after exercising or sweating	45	35.4	82	64.6
Cut fingernails weekly	111	87.4	16	12.6
Regularly wash hands with soap before eating	76	59.8	51	40.2
Always wash hands with soap after using the toilet	86	67.7	41	32.3
Dry hands thoroughly after washing, using a tissue or a clean towel	44	34.6	83	65.4
Use your personal towel	99	78.0	28	22.0
Ensure towels are properly dried after use	99	78.0	28	22.0
Wash towels at least once a week	40	31.5	87	68.5
Sharing towels with others	9	7.1	118	92.9
Ironing towels after washing or washing with warm water	12	9.4	115	90.6
Sleep in separate beds/mattresses	32	25.2	95	74.8
Sun-dry mattresses at least once a month	57	44.9	70	55.1
Multiple students sleeping on the same mattress	67	52.8	60	47.2
Wash bed linens at least once a week	24	18.9	103	81.1
Change clothes at least once daily	87	68.5	40	31.5
Share unwashed clothes with other students	85	66.9	42	33.1
Wash clothes after a single use	42	33.1	85	66.9
Ironing clothes after washing	33	26.0	94	74.0

the options of mites, viruses, or bacteria. This finding aligns with the report by Yusof et al. (12), which also noted high levels of knowledge among respondents, coupled with a tendency to give incorrect answers regarding the cause of scabies. Similarly, a study by Amoako et al. (15) conducted through interviews with respondents—including those actively suffering from scabies, those with prior experience, and individuals with no history of the condition—revealed varied responses. Most respondents answered that scabies was caused by parasites, microorganisms, or transmitted by other people.

Additionally, both healthy individuals and respondents who consulted or received treatment from health workers believed that scabies was caused by supernatural forces such as witchcraft or curses. In a prior study by Lopes et al. (16), which utilized open-ended questions, only a few respondents identified mites as the organisms responsible for scabies. Instead, the majority attributed the disease to dirtiness, poor personal hygiene, or contaminated water. In contrast, this study employed closed questions with certain unfamiliar answer options, leading many respondents to provide incorrect answers (17).

Knowledge requiring improvement includes understanding the body regions commonly affected by itching and skin disorders due to scabies, as well as the transmission patterns of *S. scabiei* mites from infected individuals to others. These two aspects serve as key indicators of students' level of scabies awareness. A lack of awareness may result in delays in seeking medical attention for diagnosis and treatment, increasing the risk of severe clinical complications, secondary infections, or misdiagnosis as other skin conditions. Moreover, the limited infrastructure in the school environment contributed to the small percentage of respondents demonstrating good personal hygiene practices. An analysis of statements related to personal hygiene revealed that respondents did not exhibit certain behaviors due to dormitory constraints. These limitations included inadequate provision of clothes irons, insufficient mattresses to accommodate all students, lack of hot water for washing, unavailability of towels or tissue paper, and restricted space for drying mattresses and personal belongings. Such factors significantly influenced personal hygiene practices. The findings of this study contrast with those of Sungkar et al. (18), which reported that instances of students sharing clothes or beds with friends stemmed from the belief prevalent among students in Islamic schools that lending personal items is a way to assist others.

Hygiene practices that could be improved through healthy living education include bathing after exercising or sweating, washing towels and bed linens at least once a week, and regularly washing used clothes. Enhancing knowledge about healthy living is expected to encourage positive behavioral changes among students (19). Education on disease prevention and clean-living practices can be delivered directly through lectures or indirectly via flyers and posters. The understanding of scabies among students was notably improved by displaying pictorial posters in various schoolrooms and dormitories, allowing for frequent viewing and easier retention of the information. A study by Hasanica et al. (20) on elementary school students who received clean and healthy living education through posters demonstrated an increase in correct answers from 58.07% to 62.76% one month after implementation. Furthermore, Kulkarni et al. (21) emphasized that posters designed with simple and localized language are a cost-effective health education tool, proven to capture and sustain public attention effectively.

Study Limitations

The study identified several limitations, including inadequate infrastructure in the boarding school environment, such as a lack of clothes irons, sufficient mattresses, hot water for washing, towels, tissues, and space to dry mattresses and personal belongings, which negatively impacted personal hygiene practices. Conducted in a non-formal Islamic boarding school with restrictions on device use and social media access, the closed environment further limited students' exposure to information about scabies. Additionally, using closed-ended questions with unknown response options in the questionnaire may have led to erroneous responses. The study also demonstrated gender bias by focusing only on male students, limiting the generalizability of its findings to female or mixed-gender populations. Cultural beliefs, such as lending personal belongings to help others, likely influenced hygiene practices and complicated improvement efforts. These findings underscore the need for improved infrastructure, culturally sensitive intervention strategies, and tailored health education to address these challenges effectively.

CONCLUSION

This study concluded that boarding school students possessed a good level of knowledge, though many struggled to identify scabies' etiology correctly. Inadequate facilities within the dormitory environment primarily influenced the moderate personal hygiene practices observed. To address these gaps, structured health education programs are recommended to enhance further students' knowledge and awareness of scabies and healthy living practices. Such initiatives could significantly reduce the risk of disease transmission in enclosed settings like boarding schools.

*Ethics

Ethics Committee Approval: The Ethics Committee of the Faculty of Medicine, Universitas Indonesia, approved the study under protocol number 21-11-1921, date: 09.11.2023.

Informed Consent: Written consent was obtained from participants aged 18 and above, who retained the right to decline participation.

Footnotes

*Authorship Contributions

Concept: S.W., S.S., Design: S.W., S.S., Literature Search: S.W., F.N., Writing: S.W., I.P.S.

Conflict of Interest: No conflict of interest was declared by the authors.

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