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Original Article

Neglected Tropical Skin Diseases Profile among Islamic Boarding School Students in Bogor, Indonesia

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Abstract

Background In 2017, the World Health Organization (WHO) identified neglected tropical diseases (NTDs), including scabies and pediculosis, as important public health concerns. These skin diseases are common in crowded settings such as Islamic boarding schools, where poor hygiene, environmental sanitation, and health behaviors may increase their prevalence and negatively affect students' quality of life.

Objective This study aims to describe the occurrence of skin diseases, including those related to NTDs in four Islamic boarding schools in Bogor, Indonesia.

Methods This cross-sectional study was conducted in four Islamic boarding schools as part of a mass dermatological examination.

Results The three most common skin diseases in this study are scabies (65.5%), pyoderma (5.6%), and pediculosis capitis (4.5%).

Conclusion NTDs in Indonesia need to be addressed with urgency and priority by all stakeholders.

Keywords Neglected skin disease; Boarding school; School-aged children.

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Introduction

Skin diseases are commonly diagnosed in the community setting, especially among densely populated settings, including boarding schools. A prior study by Prasasty *et al*. described that skin diseases were more prevalent in children living in groups, especially among those who were admitted in Islamic boarding schools. Components such as personal hygiene, healthy habits and environmental health play pivotal roles in the development of skin diseases in boarding schools. The occupancy rate in boarding schools was not proportional to the room size, thereby increasing the risk of skin disease transmissions through close contacts.[1]

In 2017, the World Health Organisation (WHO) reported that a large number of skin-related neglected tropical diseases (NTDs) was a concern. These NTDs that affect the skin include Buruli ulcer,

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cutaneous and post-kala azar dermal leishmaniasis, leprosy, lymphatic filariasis, mycetoma, onchocerciasis, scabies, and other skin infections caused by ectoparasites, such as pediculosis capitis.[2] Therefore, WHO released a road map of programs and targets in efforts to eradicate NTDs and contribute to the achievement of the Sustainable Development Goals (SDGs), which was initially set for 2020. However, with the unachieved targets by the year of 2020, the road map has been extended to 2030.[3]

There are several common NTDs in Indonesia. In many low socioeconomic settings, scabies and other parasitic skin illnesses are common and frequently associated with cramped living arrangements. Pediculosis capitis infestation, which are frequent in childhood and peak between the ages of 3 and 11, is another common infestation problem.[4]

The majority of skin diseases are not life-threatening; therefore, they are often neglected by students, teachers, and parents. However, skin disease can result in a decline in the quality of life, affecting the daily productivity and concentration of students. Failure to address skin disease in boarding schools enables them to easily spread among fellow students, thereby increasing the burden of skin disease in boarding schools.[5,6] To address this issue, the initial step involves recognizing common skin disease prevalence in Islamic boarding schools.

Based on data from the Ministry of Religious Affairs of the Republic of Indonesia, there was a total of 39,043 Islamic boarding schools dispersed throughout Indonesia. The city and regency of Bogor constitute the second-largest region in terms of the number of Islamic boarding schools in Indonesia. According to data from the Department of Communication and Information of West Java, in 2021 there were 1,242 Islamic boarding schools located in the city and regency of Bogor.[7] This study aims to describe skin diseases, including those related to NTDs in Islamic boarding schools in Bogor, Indonesia. In addition, this study is part of a larger project on early scabies detection by non-medical personnel in Bogor, which has been ongoing for over five years and in accordance with WHO's NTDs road map for eliminating NTDs by 2030.[3] By understanding the skin disease profile in Islamic boarding schools, disease prevention, early diagnosis, and prompt treatment could be implemented.

Methods

This study was a cross-sectional community-based study, conducted as a part of mass dermatological examination carried out across four Islamic boarding schools in Bogor, West Java, Indonesia. This study used a purposive sample collection method, whereas samples were gathered from students of 4 different Islamic boarding schools.

Sample size calculation was done using the following formula for descriptive studies:

$$n = \frac{Z^2 P(1-P)}{d^2}$$

n = required sample size
Z = z-score (1.96 for a 95% confidence level)
P = expected prevalence (based on a previous study)
D = margin of error (precision, 0.05/5%)

The latest prevalence of scabies in developing countries were reported to reach up to 27%; therefore, the minimum number of required samples was 303.[8]

The numbers of students in each boarding school were 469 students in Boarding School A, 352 students in Boarding School B, 260 students in Boarding School C, and 278 students in Boarding School D. The subjects of this study were aged 12-18 years old. Before the dermatological examination was conducted, all students in each boarding school filled out a self-survey regarding skin problems, and those with reported problems were later examined on the day of data collection. The dermatological examinations were carried out by dermatologists. The results of the dermatological examination were later recorded in a paper-based medical record

containing medical history, physical examination, dermatological status, diagnosis, and the given treatment. Descriptive analysis was done to process the collected data and compile the skin disease profile of Islamic boarding school students. The data analysis was performed through Microsoft Excel and SPSS version 25. Ethical clearance for this study was approved by the ethical committee of the Faculty of Medicine Universitas Indonesia (KET-120/UN2.F1/ETIK/PPM.00.02/2020 dated 10.02.2020).

Result

A number of 377 (27.7%) subjects out of 1359 students participated in this study as a population who had skin diseases. Characteristics of the subjects are presented in **Table 1**. Most of the subjects were male with a percentage of 59.9%, followed by females with a percentage of 40.1%. The mean age of the subjects who participated in this study was 13.7±1.6.

From the population, scabies was diagnosed as 18.2%. While among the 377 participants with skin diseases, the profile is presented in **Figure 1**. The top three prevalence of skin disease of all participants in this study were dominated by infectious origin, scabies (65.5%), pyoderma (5.6%), and followed by pediculosis capitis (4.5%).

From a total of 377 participants diagnosed with skin diseases, most of the subjects had only one skin disease as presented in **Table 2**.

Table 1 Sociodemographic characteristics of subjects.

Characteristics	*Total (N = 377)*
Gender	
Male	226 (59.9%)
Female	151 (40.1%)
Boarding School	
Boarding School A	88 (23.3%)
Boarding School B	88 (23.3%)
Boarding School C	82 (21.8%)
Boarding School D	119 (31.6%)
Age (years)SD	13.7±1.6

Table 2 Diagnosis of participants' skin diseases.

Number of Diagnosis	*Total (N = 377)*	*%*
One skin disease	323	85.7%
≥ Two skin diseases	54	14.3%
Boarding School A	12	
Boarding School B	11	
Boarding School C	19	
Boarding School D	12	

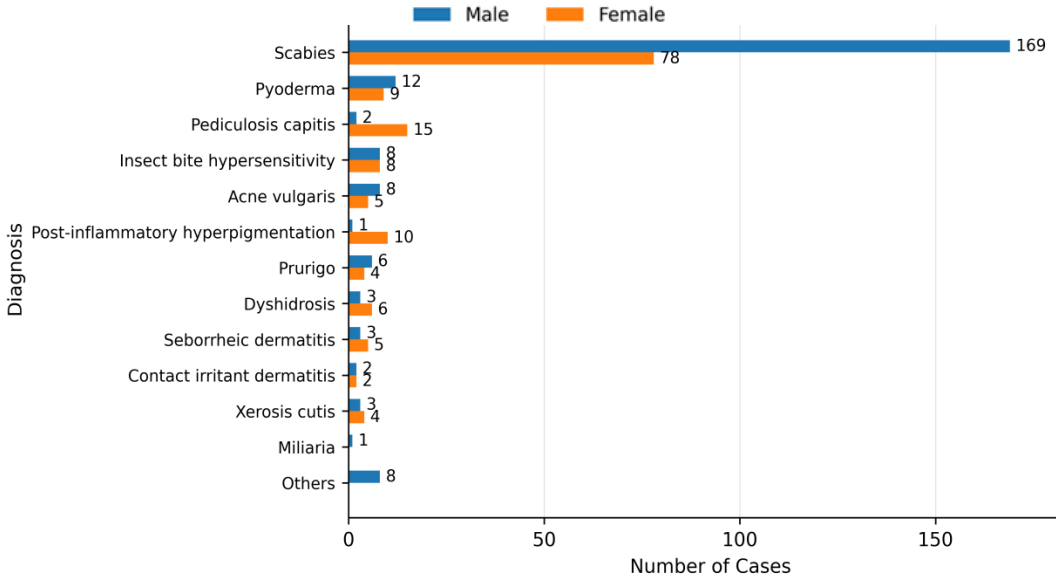


Figure 1 Skin disease profile in Islamic boarding schools in Bogor.

Discussion

WHO's NTDs road map had been set to reduce the incidence and prevalence of NTDs worldwide by the year 2030 in accordance with the SDGs. With a high poverty rate, low education quality, insufficient clean water and sanitation sources, Indonesia and other developing countries had been burdened by NTDs with surging direct health costs, productivity loss, declining socioeconomic status, and lower quality of life. Although previous initiatives had succeeded in reducing the number of people requiring interventions for NTDs by 600 million in 2020 compared to 2010, there were still milestones and targets to be achieved in the following decade.[3]

Overall, the recent road map aimed to reduce the number of people needing interventions against NTDs by 90%, to reduce the number of disability-adjusted life years associated with NTDs by 75%, and for 100 countries being able to eliminate at least one of the NTDs and to eradicate two NTDs. One of the approaches to achieve these goals was by sharing and implementing eradication strategies of countries with NTDs and integrating NTDs interventions in the Universal Health Coverage (UHC) of the respective countries. In relation to our study, scabies and other ectoparasites, which are prevalent in Islamic boarding schools or other communal living environments, had an indicator of its management being integrated with the UHC care package in countries worldwide.[3] It was clear that there was still a lack of understanding of scabies in the community, resulting in a lack of awareness of the disease and the consequent lack of attention to the cases of the disease, which continues to be the primary infectious disease in boarding schools with a prevalence of 18.2% of all our study population. Health promotion and surveillance, especially for scabies cases, required active involvement from the community, like non-medical personnel.

To reduce the incidence and prevalence of NTDs within a population, broader interventions were required beyond treating individual patients alone. According to the WHO's NTDs road map, mass drug administration (MDA) was identified as one of the core intervention strategies necessary for reducing NTDs. MDA involves the large-scale distribution of medicines within specific populations, regardless of the presence of symptoms or infection. In this study, given the high prevalence of scabies in boarding schools (65.5% among study participants), the implementation of MDA needs to be considered. WHO recommended the MDA approved for scabies and ectoparasites was oral ivermectin in combination with topical scabicides for those unable to use ivermectin. Furthermore, with the widespread administration of MDA within the population, monitoring drug resistance became crucial.[3]

In our study, the three most prevalent skin diseases found in the students in boarding schools were scabies (65.5%), pyoderma (5.6%), and pediculosis capitis (4.5%). The majority of the most common skin diseases found in boarding school students belong to the group of infectious skin diseases. The result of our study resembled what prior studies established. A study by Rayinda *et al*. conducted in Magelang Regency, Central Java, Indonesia, found that the most frequently encountered skin disease in boarding school students was predominantly infectious. The mentioned diseases frequently encountered were dermatophytosis (37.74%), scabies (35.78%), acne vulgaris (15.84%), ecthyma (3.26%), as well as pityriasis versicolor and irritant contact dermatitis (0.74%).[8]

In this study, those with pediculosis capitis (1.25% of our study population) were found based on subjects' self-reports later confirmed by dermatovenereologists, while another study in Indonesia reported that prevalence of pediculosis capitis varied between 64.6% to 100%. Meanwhile, in Asia, the prevalence was 15.1%±12.8%.[9,10] A recent study showed that out of 100 female students aged 11-15 years old, 100% suffered from pediculosis capitis.[4] This finding showed that pediculosis capitis was still neglected in Indonesia, and the awareness of both medical personnel and the

community regarding pediculosis capitis were still very low. As one concrete form of implementation, there should be a massive health promotion and socialization program regarding pediculosis capitis, scabies, and other NTDs in Islamic boarding schools or other densely populated settings.

Another study by Sahala, *et al*. in South Jakarta, Indonesia, also demonstrated consistent results. Out of 156 boarding school students with skin diseases, 136 students (87%) had infectious skin diseases, while 20 students (13%) had non-infectious skin diseases. It was found that poor hygiene habits, shared clothing, and bedding contributed to the occurrence of skin disease.[11]

Previous studies had not mentioned sufficient information about participants being diagnosed with more than one skin disease. Interestingly, 14.3% of our participants presented with two or more skin diagnoses. Additionally, Boarding School C had the most students diagnosed. The most common diagnoses among students with multiple skin diseases were scabies (29.6%), pediculosis capitis (18.5%), seborrheic dermatitis (11.1%), and secondary infection (7.4%) consecutively.

Limitations of this study are a limited number of samples, a cross-sectional study method, and the limited scope of the study, which only includes a certain population inside Islamic boarding schools.

Conclusion

Skin diseases were commonly found in the setting of Islamic boarding schools, with the main three diagnoses tending to be infectious, which were scabies, pyoderma, and pediculosis capitis. Two out of three skin diseases found were NTDs, showing that the diseases were still neglected in Indonesia. NTDs in Indonesia need to be addressed with urgency and priority by all stakeholders.

Declaration of patient consent Authors certify that they have obtained all appropriate patient consent.

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Conflict of interest No conflict of interest.

Author's contribution

SW,DF,AK,KB: Substantial contributions to concept, study design, acquisition of data and manuscript critical review.

SMS,ID,MS,UAMNP: Substantial contributions to concept, study design, acquisition of data and manuscript critical review.

NWS,SS,MEPH: Substantial contributions to acquisition, analysis and interpretation of data and manuscript critical review.

Every author has given final approval of the manuscript version to be published and agreed to be accountable for all aspects of the work.

References

1. Prasasty GD, Handayani D, Dalilah. Efforts to prevent variations of skin disease in Islamic boarding schools through personal hygiene and sanitation education. *Arkus*. 2019;**5(1)**:64-7.
2. World Health Organization. Recognizing neglected tropical disease through changes on the skin: a training guide for front-line health workers. Asiedu K, editor. Geneva: World Health Organization; 2018. Available from: https://www.who.int/publications/i/item/9789241513531
3. Ending the neglect to attain the sustainable development goals: a road map for neglected tropical disease 2021–2030. Geneva: World Health Organization; 2020. Available from: https://www.who.int/publications/i/item/9789240010352
4. Rahmayunita G, Pertiwi LK, Ascobat P, Widaty S. Efficacy and safety of 1% and 5% permethrin lotion as treatment for pediculosis capitis in children: a double blind randomized controlled study. *J Pak Assoc Dermatol*. 2023;**33(2)**:513-8.
5. Widaty S, Saputra J, Suprapto N, Natasha J, Azis MH, Lestarini D, *et al*. Characteristic of skin disease in two public boarding schools occupants in West Java 2018. *eJKI*. 2011;**11(1)**:14-8. doi:10.23886/ejki.11.217.14
6. Iradaty F, Suyanto E, Aji B, Harimi AC. Female students' experience in preventing scabies. *Int J Public Health Sci*. 2021;**10(3)**:581.

7. Jumlah Pondok Pesantren Berdasarkan Kabupaten/Kota di Jawa Barat. [Internet]. Provinsi Jawa Barat; 2020 [cited 2026 Jun 21]. Available from: https://opendata.jabarprov.go.id/id/dataset/jumlah-pondok-pesantren-berdasarkan-kabupatenkota-di-jawa-barat (reference not complete journal name, issue , page number)
8. Fauzah R, Suparmi S. Analysis of the Scabies Incidence at As'ad Islamic Boarding School, Jambi City. Arch Razi Inst. 2023;78(6):1719–27.
9. Rayinda T, Susetiati DA, Febriana SA. Profil penyakit kulit pada pelajar sekolah asrama di Kabupaten Magelang, Jawa Tengah. *J Comm Empower Health* . 2019;**1(2)**:79-84.
10. Hapsari RR. Pediculosis capitis in female students' life at pondok pesantren PPAI an-nahdliyah kabupaten Malang. *Media Gizi Kesmas*. 2021;**10(1)**:24–31.
11. Akhmad MA, Menaldi SL. The prevalence of pediculosis capitis and the association between the level of infestation and the characteristics of female students in X boarding school, East Jakarta. Faculty of Medicine Universitas Indonesia; 2012. Available from: https://library.fk.ui.ac.id/index.php?p=show_detail&id=18228&keywords=%5C%22Leprosy+--+diagnosis%5C%22&page=1&title=prevalensi-pedikulosis-kapitis-dan-hubungan-tingkat-infestasi-dengan-karakteristik-santri-putri-pesantren-x-jakarta-timur-the-prevalence-of-pediculosis-capitis-disease-and-the-association-between-the-level-of-infestation-and-the-characteristics-of-female-students-in-x-boarding-school-east-jakarta-
12. Sahala MA, Soedarman S, Rizky LA, Natanegara AP, Advani MS, Sungkar S. The prevalence of skin disease and its association with hygiene behavior and level of education in a pesantren, Jakarta Selatan 2013. *eJKI*. 2016;**4(2)**:119-24.