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Abstract

Background: Scabies is a neglected tropical disease in which people affected primarily presents with intense pruritus. The disease is often recurrent, especially in people living in close contacts, such as in a community; thus, it negatively impacts their quality of life (QoL). This study analyzes the impact of pruritus in scabies on the QoL of patients living in a public boarding school (PBS) in West Java, Indonesia.

Methods: This study is a mixed-method study conducted on 39 subjects. The QoL was examined using the Indonesian version of the dermatology life quality index (DLQI) questionnaire and in-depth interviews.

Results: Most subjects were female, grade 9 students, had a duration of symptoms between six months to one year, had been infected more than twice, and with no family member affected by the same symptoms. We found that sex, duration of symptoms, disease frequency, and affected family members did not significantly affect subjects' QoL. In-depth interviews revealed that pruritus affected social relationships, quality of learning, and sleeping.

Conclusion: Holistic and comprehensive community management is needed to treat and prevent scabies transmission, as its symptoms negatively impact the QoL of students in PBS.

Keywords: *pruritus, boarding school, QoL, scabies*

Background

Approximately 200 million people worldwide were affected by scabies at least once in their lifetime.¹ According to the Global Burden of Disease Study, Indonesia has the highest burden of scabies.² Data from the Indonesian Ministry of Health in 2013 revealed that the prevalence of scabies ranges from 3.9-6%; however, it may reach up to 84.8% in public boarding schools (PBS).^{3,4}

Nocturnal pruritus is one of the cardinal signs of scabies. In PBS, this symptom may be recurrent due to repeated contact even after treatment completion, causing embarrassment and anxiety. It also affects the quality of sleep at night.⁵ Sleep deprivation, especially in children, can disrupt the concentration and learning process at school. The itch-scratch cycle that occurs continuously also

poses a high risk of infection. Skin lesions with the accompanying infection might lead to the feeling of embarrassment and shame. Scabies is most often found in a community; thus, appropriate prevention and management are needed to stop the transmission.⁶ Overall, scabies can negatively impact a person's quality of life (QoL), including school-aged children. This study evaluates the impact of pruritus in scabies infestation on the QoL of students enrolled in a PBS in West Java, Indonesia.

Methods

A total of 40 students with scabies was recruited to this cross-sectional study using consecutive sampling in a PBS in West Java, Indonesia, in 2018. However, one subject did not have a complete record and was excluded. This study is a mixed-method study using the Indonesian version

of the DLQI questionnaire and in-depth interview.⁷ Five subjects were randomly selected to undergo in-depth interviews consisting of open-ended questions that focused on how scabies directly impacted their daily activities. Question number 9 of the DLQI questionnaire about sexual relationships was omitted as it was irrelevant to the subjects' age. Ethical approval was obtained from Faculty of Medicine Universitas Indonesia Ethical Committee No. 1098/UN2.F1/ETIK/2017.

This study included both male and female students in the PBS, from grade 7 through grade 9, who had scabies. The diagnosis of scabies was established by dermatologists and dermatology residents based on the cardinal signs for scabies. Scabies symptom durations were classified into less than 6 months, 6 months to 1 year, and over 1 year. The frequency of contracting the disease was classified into once, twice, and more than twice. The number of family members affected by scabies was not recorded; instead, it was classified into having or not having affected family members.

After questionnaire completion, the total score was divided into five categories according to the impact of pruritus on QoL. Score 0 to 1 was graded as having 'no impact,' 2 to 5 as 'mild impact,' 6 to 10 as 'moderate impact,' 11 to 20 as 'severe impact,' and 21 to 30 as 'very severe impact.'⁶ We also conducted in-depth interviews until saturation was reached, with a total of five subjects (12.8%) as representatives. An in-depth interview was performed with these subjects to obtain a more thorough perspective. Statistical analysis was conducted using the software Statistical Package for the Social Sciences version 25. Kruskal-Wallis test was performed to establish the statistical significance of our data.

Results

Of the 39 subjects, most were female, and all ranged from 12-15 years old. The majority of subjects were grade 9 students and have had scabies for around 6 months to one year. Most subjects had experienced scabies more than twice, and there were more subjects without family members affected by the same disease. Subject characteristics are shown in Table 1.

Table 1. Characteristics of subjects enrolled in a PBS in West Java, Indonesia in 2018 (N=39)

Variable	Category	n	%
Sex	Male	18	46.15
	Female	21	53.85
Education	Grade 7	12	30.77
	Grade 8	5	12.82
	Grade 9	22	56.41
Duration of symptoms	< 6 months	12	30.77
	6 months - 1 year	14	35.90
	> 1 year	13	33.33
Frequency of disease	1	11	28.20
	2	4	10.26
	>2	24	61.54
Affected family members	Present	13	33.33
	Absent	26	66.67

Table 2 showed that no subjects considered scabies to have 'no impact' nor 'very severe impact' on their QoL. Most subjects had a DLQI score of 11-20, and it was more commonly seen in females. Statistical analysis revealed no significant association between sex and DLQI score. Fifty percent of grade 9 students had the DLQI score in the severe impact category. However, education level had no significant association with the DLQI

score. Duration of symptoms varied from a week to 5 years and had no significant association with the DLQI score. Although subjects who had experienced scabies twice had higher DLQI scores, no significant relationship was found between a higher frequency of scabies and the DLQI score. Having affected family members also had no association with the DLQI score.

Table 2. Association between subjects' characteristics, duration of symptoms, disease frequency, and affected family members with DLQI score (N=39)

Variable	DLQI score					Total N (%)	P
	No impact n (%)	Mild impact n (%)	Moderate impact n (%)	Severe impact n (%)	Very severe impact n (%)		
Sex							0.976*
Male	0 (0)	2 (11.11)	8 (44.44)	8 (44.44)	0 (0)	18 (100)	
Female	0 (0)	2 (9.52)	9 (42.86)	10 (47.62)	0 (0)	21 (100)	
Education							0.644*
Grade 7	0 (0)	1 (8.33)	5 (41.67)	6 (50)	0 (0)	12 (100)	
Grade 8	0 (0)	0 (0)	2 (40)	3 (60)	0 (0)	5 (100)	
Grade 9	0 (0)	3 (13.64)	10 (45.45)	9 (40.91)	0 (0)	22 (100)	
Duration of symptoms							0.776*
< 6 months	0 (0)	2 (16.67)	5 (41.67)	5 (41.67)	0 (0)	12 (100)	
6 months-1 year	0 (0)	1 (7.14)	6 (42.86)	7 (50)	0 (0)	14 (100)	
> 1 year	0 (0)	1 (7.69)	6 (46.15)	6 (46.15)	0 (0)	13 (100)	
Disease frequency							0.839*
1	0 (0)	1 (9.09)	6 (54.55)	4 (36.36)	0 (0)	11 (100)	
2	0 (0)	0 (0)	1 (25)	3 (75)	0 (0)	4 (100)	
>2	0 (0)	3 (12.5)	10 (41.67)	11 (45.83)	0 (0)	24 (100)	
Affected family members							0.662*
Present	0 (0)	1 (7.70)	7 (53.84)	5 (38.46)	0 (0)	13 (100)	
Absent	0 (0)	3 (11.54)	10 (38.46)	13 (50)	0 (0)	26 (100)	
Total	0 (0)	4 (10.26)	17 (43.59)	18 (46.15)	0 (0)	39 (100)	

*Kruskal-Wallis test

An in-depth interview was conducted on five subjects, 3 females and 2 males, to better understand the impact of pruritus on the students' QoL. Open-ended questions were used during the interview. All five subjects had a variable DLQI score (two mild impacts, two moderate impacts, and one severe impact). One of the problems discussed during the interview was how pruritus disturbed activities such as studying, both in class and in their dormitory. In addition, nocturnal pruritus also caused problems while sleeping and praying. The interview result of 3 subjects who had the DLQI score categorized as moderate to severe impact is shown below:

"...there are times that I did not go to school..." (EJ, female, 12 years old)

"Very annoying... sleep is sometimes affected... frequent awakenings... sometimes twice..." (F, female, 13 years old)

"Yes, I often scratch in class... pretty annoying... cannot concentrate..." (MAM, male, 12 years old)

Although the DLQI score was mild, the pruritus affected the subject's daily activities, as noticed in the statement below:

"...feeling annoyed when studying, also praying... cannot focus and concentrate, just scratching in class..." (MA, male, 13 years old)

In addition, the pruritus also disturbed the subjects' social relationship, as indicated in the statement below:

"...when walking together, most of my friends held hands, but some did not..." (HF, female, 14 years old)

“...itchy... sometimes I distance myself... afraid the disease will spread...” (MAM, male, 12 years old)

From the interview, scabies was found to have no effect on the subjects' relationship with their family. However, some family members also had similar symptoms, most probably transmitted by the subject. This could be seen from the statement below:

“Yes, there is, it spread when I went home... No, not embarrassed... No, my family didn't act differently...” (HF, female, 14 years old)

Family members did not treat the subjects differently. Statements about their family's attitude towards them are as follows:

“No, my family members did not act differently” (MA, male, 13 years old)

“...treated... nothing different, no...” (MAM, male, 12 years old)

“Nothing different...” (F, female, 13 years old)

Discussion

In this study, we found more females with scabies infestation than males. This result is different from studies by Sungkar *et al.*⁸ and Purwanto *et al.*⁹, who reported that scabies was much more frequent in male. Females generally socialize better, have closer relationships, and are more eager to sleep together with their friends on the same bed. Moreover, they commonly exchange headscarves (also known as *hijab*), combs, and praying tools such as Muslim women's prayer dresses. These factors may lead to faster spread of the disease among them. Naftassa *et al.*¹⁰ also reported that scabies occurred more often in female students, and this might be related to the room density in the boarding school.

Scabies infestation commonly presents as nocturnal pruritus. Though not a life-threatening condition, the disease could decrease QoL by disturbing essential activities of students' life (e.g., sleeping, studying). Males are generally more indifferent and did not give much attention to their appearance, explaining the lower DLQI score compared to females. In contrast, Jin-gang *et al.* found that males are 1.26 times more likely to have a higher DLQI score than female, though statistically insignificant.¹¹

Education, duration of symptom, frequency of disease, and affected family members were not significantly associated with QoL. This result is

consistent with a study by Worth *et al.*¹² that reported the same conclusion for the duration of symptoms. Impairment to QoL tended to be perceived as more severe by patients suffering for a long time compared to those with a relatively short history of scabies, but the difference was not statistically significant. Setiawan *et al.*¹³ reported that PBS students considered scabies as an ordinary occurrence. In addition, subjects in the study also stated that all PBS students ought to experience the disease. Consequently, the disease could recur even after successful treatment. However, it does not seem to bother them, as reflected in this study, that frequency of disease was not associated with the DLQI score. This attitude causes a consecutive effect that when these students go home on school holidays, they can also spread the disease to their family members.

Concentration is vital to gain as much knowledge in PBS. Though the students considered scabies as commonplace, the fact that the pruritus caused by the disease negatively affected their learning process was indisputable. As Sudarsono *et al.* stated in their study, students with scabies had lower academic achievement compared to before they had the disease.¹⁴ Excessive scratching due to the pruritus hindered the students from concentrating in class, as shown in their answers from the in-depth interview.

The limitation of this study is that only a few subjects were included, so the result was not representative of the wider population. However, detailed information was obtained through in-depth interviews.

Conclusion

Scabies is a substantial problem in several PBS in Indonesia as it negatively impacts the students' QoL by disturbing their daily activities. Holistic and comprehensive management is needed to relieve symptoms, treat, and prevent the recurrence of this disease in order to improve the students' QoL.

Abbreviations

DLQI : Dermatology Life Quality Index
PBS : Public Boarding School
QoL : Quality of Life

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Conflict of Interests

The authors declared no conflict of interest regarding the publication of this article.

Ethics Approval and Consent to Participate

Ethical approval was obtained from Faculty of Medicine Universitas Indonesia Ethical Committee No. 1098/UN2.F1/ETIK/2017. All subjects had given written consent to participate in this study.

Availability of Data and Materials

The data and materials used and analyzed in this study are available from the corresponding author upon reasonable request.

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