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Gender Differences in Scabies Risk Factors at Darul 'Ulum Islamic Boarding School, Cilacap

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ABSTRACT

Background: *The global prevalence of scabies remains high, with approximately 300 million cases reported annually. Despite educational and behavioral interventions implemented in Islamic boarding schools, case reduction has been insignificant. Gender-related risk factors for scabies require further investigation.* ***Objective:*** *This study aimed to determine the differences in scabies risk factors between males and females at A.P.I Darul 'Ulum Islamic Boarding School, Cilacap.*
Methods: *An observational analytic study with a cross-sectional approach was conducted on 37 students selected through total sampling from February to March 2024. Data were collected using questionnaires and physical examinations and analyzed using Fisher's exact test.* ***Results:*** *Scabies was identified in 10.8% of the respondents (4 out of 37), all of whom were males. Most respondents exhibited poor personal hygiene (73.0%) and normal nutritional status (56.8%). Significant differences were found in scabies incidence based on gender (p=0.036), knowledge level (p<0.001), and nutritional status (p=0.003). However, personal hygiene did not show a significant correlation with scabies incidence (p=0.557). Male respondents with underweight nutritional status and low knowledge levels had a higher risk of scabies (40%).* ***Conclusion:*** *There were differences in scabies risk factors between males and females at A.P.I Darul 'Ulum Islamic Boarding School, Cilacap.*

1. INTRODUCTION

Scabies is a dermatological disease caused by the infestation of *Sarcoptes scabiei var. hominis*. It manifests as nocturnal intensely pruritic skin lesions, which may include papules, pustules, and burrows. Transmission primarily occurs through prolonged skin-to-skin contact (Ventura-Flores, 2021). Globally, scabies affects approximately 300 million individuals annually, making it a significant public health concern (Sunderkötter et al., 2021). In Indonesia, scabies prevalence remains high, particularly in environments with high population density, such as Islamic boarding schools (*pesantren*) (Hilma and Ghazali, 2014; Ma'rufi et al., 2015).

Islamic boarding schools in Indonesia often have communal living conditions that facilitate the spread of scabies. Despite various preventive measures, including education on hygiene and behavior modification, scabies incidence remains high. Understanding gender-related differences in scabies risk factors could help tailor prevention strategies more effectively(Sofia and Widad, 2016; Haningsih, 2018). This study aims to evaluate the differences in scabies risk factors between male and female students at A.P.I Darul 'Ulum Islamic Boarding School, Cilacap, focusing on knowledge levels, personal hygiene, and nutritional status.

2. METHOD

This study employed an observational analytic design with a cross-sectional approach and previously had been given an Ethical Approval conducted by The Research Ethics Committee of Faculty of Medicine, Universitas Jenderal Soedirman (Ref: 067/KEPK/PE/VIII/2024). The sample consisted of 37 students (17 males, 20 females) selected

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through total sampling from February to March 2024. Data were gathered through: questionnaires to assess knowledge about scabies, personal hygiene behaviors, and shared item usage and physical examinations to confirmed scabies diagnosis based on cardinal signs of scabies and dermatological assessment.

Collected data included scabies state, genders, ages, knowledge about scabies, personal hygiene behaviors, and nutritional stateby body mass index (BMI) then analysed with Fisher's exact test was to determine statistical significance in scabies prevalence concerning gender, personal hygiene, knowledge levels, and nutritional status. A significance of $p<0.05$ was considered statistically significant.

3. RESULT AND DISCUSSION

Result

Demographic Subject Characteristics

Subject characteristics were shown on table 1. Of the 37 students, 54.1% were females, and 45.9% were males. The majority (64.9%) were aged 16-18 years. Most respondents (73.0%) had poor personal hygiene, and 56.8% had normal nutritional status. Scabies was found in 10.8% of respondents (4 out of 37), all of whom were males.

Table 1. Subject characteristics

Variables		Genders		Total	%
		Male (n = 17)	Female (n = 20)		
Ages	13 – 15 y.o	2 (25.0)	6 (75.0)	8	21.6
	16 – 18 y.o	11 (45.8)	13 (54.2)	24	64.9
	19 – 22 y.o	4 (80.0)	1 (20.0)	5	13.5
Knowledge	Low	6 (100)	0 (0.0)	6	16.2
	Moderate	5 (41.7)	7 (58.3)	12	32.4
	High	6 (31.6)	13 (68.4)	19	51.4
Personal hygiene	Bad	16 (59.3)	11 (40.7)	27	73.0
	Good	1 (10.0)	9 (90.0)	10	27.0
Nutritional State (IMT)	Underweight	6 (60.0)	4 (40.0)	10	27.0
	Normal	11 (52.4)	10 (47.6)	21	56.8
	Overweight	0 (0.0)	5 (100)	5	13.5
	Obese	0 (0.0)	1 (100)	1	2.7
Scabies	Yes	4	0	4	10.8
	No	13	20	33	89.2

The Differences between Scabies Prevalence and Risk Factors

The differences between scabies prevalence and risk factors were displayed the table 2 below. This table showed scabies was significantly more prevalent among males ($p=0.036$).Lower knowledge levels were significantly associated with scabies incidence ($p<0.001$). There was no significant correlation between personal hygiene and scabies incidence ($p=0.557$) with underweight males were significantly more likely to have scabies ($p=0.003$).

Table 2. The differences between scabies prevalence and risk factors

Variables		Scabies		p-value
		Yes	No	
Gender				
	Male	4 (23.5)	13 (76.5)	0.036*
	Female	0 (0.0)	20 (100)	
Knowledge				
	Low	4 (66.7)	2 (33.3)	<0.001*

Moderate/High	0 (0.0)	31 (100)	
Personal Hygiene			
Bad	4 (14.8)	23 (85.2)	0.557*
Good	0 (0.0)	10 (100)	
Nutritional State			
Underweight	4 (40.0)	6 (60.0)	0.003*
Normal/ Overweight/Obese	0 (0.0)	27 (100)	

* Fischer test

Discussion

Gender Differences in Scabies Prevalence

The findings align with previous studies that suggest males are at higher risk of scabies due to differences in hygiene behaviors and knowledge. Cultural and social norms may contribute to this discrepancy, as males may have less stringent hygiene practices compared to females. Anastasya (2023) in her study also showed 80% scabies occurred in males rather than females. In other study at Pesantren Miftahul Ulum Jember also showed male had odd ratio 0.535 than female meaned scabies were more likely happened in males than females. Furthermore, a meta-analysis of 10 studies conducted in various regions indicated that male students are at a higher risk of developing scabies compared to female students. This meta-analysis reported a pooled prevalence ratio (PR) of 2.12 (95% CI: 0.24 – 1.27), leading to the conclusion that male students have a 2.12 times greater risk of experiencing scabies than female students (Mufidahatul et al., 2023).

Knowledge and Scabies Incidence

Lower knowledge levels were significantly associated with higher scabies prevalence. Education about scabies prevention needs to be reinforced, particularly among male students, to improve awareness and hygiene practices. This result similar to prior study conducted by Elena (2021). The level of knowledge about scabies in male responders was lower than female responders (4,8% vs 21,4%) (Elena and Song, 2021). The differences the level of knowledge between male and female students also described by Rong (2017). The study showed female students had better capacity in adaptive learning including positive behaviors, contextual and learning of new matters (Rong et al., 2017).

Personal Hygiene

Despite poor personal hygiene being common among respondents, it was not significantly associated with scabies incidence. This finding may be due to variations in specific hygiene behaviors, such as clothing washing frequency and bedding sanitation, which were not individually assessed. In a study was conducted by Aulia (2022) in an Islamic boarding school at Padang, Indonesia, had similar results which not all personal hygiene indicators had correlation with the incidence of scabies, though some indicators such skin, hand and nail sanitation significantly correlated with scabies (Aulia et al., 2022). Personal hygine is not the only one factor related to scabies. Multifactors play role in the pathogenesis of scabies such as close contact to scabies patient by skin to skin contact nor sharing personal items, crowded living condition, weakened immune system and many others (CDC, 2024).

Nutritional Status and Scabies Risk

Underweight males had a higher prevalence of scabies, suggesting that poor nutrition may weaken the immune system, making individuals more susceptible to infestations. Nutritional interventions could play a role in reducing scabies susceptibility. This result was similar to a study conducted by Nafisah (2023). The study showed scabies was high in underweight male students (Nafisah et al., 2023).

The relationship between nutritional status and scabies can be explained as follows. Good nutritional status enhances the immune system, making the body more resistant to scabies

transmission. The body requires energy for daily activities, making adequate and proper nutrient intake essential (Munteanu and Schwartz, 2022). Nutrition consists of key elements necessary for bodily functions and processes, including carbohydrates, proteins, fats, vitamins, minerals, and water. Nutritional status reflects the body's condition as a result of the balance between nutrient intake and bodily needs (Nafisah et al., 2023).

A bivariate analysis showed that nutritional status significantly influenced scabies incidence, particularly among male students (p=0.003). This finding aligns with a study by Dharmawan conducted in an Islamic boarding school in Mataram City, which reported a significant relationship between nutritional status and scabies incidence (p<0.001). The Spearman Rank correlation analysis of nutritional status and scabies showed a moderate correlation strength, with a value of 0.508.

The limitation of this study was there was no scabies incidence in female students, therefore the risk factors differences could not be analysed statistically. Further studies with larger sample sizes and more detailed hygiene behavior assessments are recommended to better understand scabies transmission dynamics in boarding schools.

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4. CONCLUSION

Significant gender differences were observed in the risk factors associated with scabies among students at A.P.I. Darul 'Ulum Islamic Boarding School in Cilacap. Male students exhibited a higher prevalence of scabies, which may be attributed to lower levels of knowledge and suboptimal nutritional status. Interestingly, while poor personal hygiene was commonly reported among students, it did not show a statistically significant association with scabies incidence in this setting. To reduce scabies morbidity and prevent its transmission, efforts should be directed toward enhancing students' knowledge about scabies, improving their nutritional status, and promoting better personal hygiene practices.

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