Jurnal Kesehatan Lingkungan
Journal of Environmental Health
Journal Home Page: https://e-journal.unair.ac.id/JKL
Vol. 16 No. 2
DOI: 10.20473/jkl.v16i2.2024.110-117
ISSN: 1829 - 7285 | E-ISSN: 2040 - 881X
ORIGINAL RESEARCH Open Access

PERSONAL HYGIENE AS SCABIES FACTORS INCIDENCE IN THE INSTITUTE REHABILITATION CENTER OF THE VAGRANTS, SCROUNGER AND MENTAL DISABILITIES IN SOUTH SUMATRA REGION

Rahmadita Zinda Haniifa[1]*

[1]Departmen of Environmental Health, Public Health Faculty, Sriwijaya University, Indralaya, 30662, Indonesia

Corresponding Author:
*) rahmaditaznd@gmail.com

Article Info
Submitted : 3 January 2024
In reviewed : 21 February 2024
Accepted : 16 April 2024
Available Online : 30 April 2024

Keywords : *Open Defecation Behavior, Personal Hygiene, Scabies*

Published by *Faculty of Public Health Universitas Airlangga*

Abstract

Introduction: *Scabies, caused by the mite Sarcoptes scabiei, is a highly contagious skin infestation. Poor personal hygiene often contributes to its prevalence. This study aims to identify specific aspects of personal hygiene that influence the incidence of scabies among residents of the Institute Rehabilitation Center of The Vagrants, Scroungers, and Individuals with Mental Disabilities in the South Sumatra Region.* ***Methods:*** *This observational-analytic study employed a case-control design. Data collection involved clinical records, observations, and questionnaire-based interviews. A total of 160 occupants, comprising 80 cases and 80 controls, were selected through simple random sampling. Data analysis utilized chi-square test and multiple logistic regression tests.* ***Results and Discussion:*** *Chi-square analysis revealed significant associations (p-value = 0.000) between scabies incidence and bathing habits, cleanliness of mattresses and bed linen, cleanliness of clothing, and open defecation behavior. Multiple logistic regression indicated that open defecation behavior (OR = 56.336; 95% CI = 17.281 – 158.500) was the primary personal hygiene factor influencing scabies incidence. Thus, maintaining proper open defecation practices is crucial for residents' hygiene and health.* ***Conclusion:*** *Poor personal hygiene practices, including inadequate bathing habits, unclean bedding, dirty clothing, and open defecation behavior, contribute to the occurrence of scabies. Effective education and counseling by healthcare professionals are essential for promoting better hygiene practices among residents.*

INTRODUCTION

Scabies is an infectious skin disease resulting from infestation by a mite. The mite responsible for scabies is named *Sarcoptes scabiei Var Hominis* (1). It is a parasite of the family Sarcoptidae, class Arachnida, which infests the skin. *Sarcoptes scabiei* mites cause severe itching, particularly intensifying at night, which significantly disturbs sufferers (2). This itching can disrupt learning, working activities, and resting. Scabies mite infestation results in intensely itchy skin, characterized by papules, nodules, and vesicles (3). It commonly affects children aged 2 to 5 years. In adulthood, scabies can spread through sexual intercourse, with increased risk of transmission occurring with prolonged skin contact and a high density of scabies mites (4). Infants may have involvement of the face, head, neck, and soles. Delayed diagnosis of scabies can lead to serious complications, such as crusted scabies (5). Crusted scabies, a highly infectious variant of *Sarcoptes scabiei*, is often found in individuals with compromised immunity or underlying conditions such as immunosuppression, neurological disorders with reduced sensation, and psychiatric disorders (6). Scabies remains a significant global health issue, particularly in resource-poor areas (7). In 2017, the World Health Organization (WHO) categorized scabies as a Neglected Tropical Disease (NTD) and recognized it as an endemic disease. Current estimates suggest there are over 200 to 300 million cases worldwide annually, based on various recent sources (8). The prevalence of scabies ranges from 0.2% to 71% (9), with children in

Cite this as :
Haniifa RZ. Personal Hygiene as Scabies Factors Incidence in the Institute Rehabilitation Center of the Vagrants, Scrounger and Mental Disabilities in South Sumatra Region. *Jurnal Kesehatan Lingkungan*. 2024;16(2):110-117. https://doi.org/10.20473/jkl.v16i2.2024.101-117

resource-poor areas being disproportionately affected, with estimates ranging from 5% to 50% (10). Scabies is endemic to tropical and subtropical regions, including Southeast Asia, South Asia, South America, and Africa for tropical areas, and Central Asia, West Asia, Europe, and Australia for subtropical areas. The highest incidence of scabies occurs in five countries, one of which is Indonesia (11).

The International Alliance for the Control of Scabies (IACS) stated that the prevalence of scabies in Southeast Asia, especially in Timor Leste, was 19.2% (12). According to the Government of Health of the Republic of Indonesia in 2018, the prevalence of scabies ranged from 5.6% to 12.95%, making scabies the most common skin disease in Indonesia (13). In Palembang City, the prevalence of scabies accounts for 8.9% of all infectious skin diseases (14). Over the last three years (2020-2022), the proportion of cases at the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in South Sumatra was 26.7%, 20%, and 55.5%, respectively (15).

Scabies is a contagious skin disease caused by poor *personal hygiene* (16). It is often found in densely populated places such as dormitories, rehabilitation centers, prisons, and boarding schools. These places usually have many people who do not maintain their personal hygiene, thereby increasing the likelihood of direct contact between scabies sufferers and healthy individuals (non-sufferers) (17). Based on a direct survey conducted at the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region, there are places where environmental sanitation conditions can be described as very poor. These conditions include high occupancy density, lack of clean water availability, poor condition of latrine facilities, and inadequate wastewater sewer availability. Regarding *personal hygiene* at the time of the survey, most of the residents exhibited open defecation behavior, mattresses and bed linen cleanliness was not maintained, and clothes cleanliness, along with bathing habits, were poor, resulting in inadequate skin hygiene maintenance (18).

The aim of this study was to determine the role of *personal hygiene* factors in the incidence of scabies at the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in South Sumatra. The research hypothesis posited a correlation between personal hygiene practices (such as bathing habits, cleanliness of mattresses and bed linen, cleanliness of clothes, and open defecation behavior) and the incidence of scabies, aiming to identify the primary factor contributing to scabies incidence.

METHODS

This study was an observational-analytic study with a case-control design. In a case-control study, cases are subjects with certain characteristics or criteria. These characteristics or criteria may include clinical data, outcomes, side effects, or any other traits (19). Data collection was conducted from December 2022 to February 2023. The population in this research consisted of all the residents who stayed and lived in the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region, totaling 180 residents. The sample size for this study was 160 samples selected using simple random sampling, comprising 80 cases and 80 controls.

The criteria for the case groups include residents who reside in the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region, are willing to participate as research subjects, and have been diagnosed with scabies based on clinical data. The criteria for the control groups are slightly different from the case group, comprising residents who have not been diagnosed with scabies based on clinical data from the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region.

Data were obtained through clinical records, observations, and interviews using questionnaires administered to the respondents. This study was analytical in nature, as all variables were subjected to statistical tests (chi-square tests) using data processing software to determine the correlation between personal hygiene and the incidence of scabies. Multivariate analysis was employed to identify the personal hygiene factors that most significantly influence the incidence of scabies, utilizing multiple logistic regression.

The independent variables in this study comprised residents' personal hygiene activities, including bathing habits, cleanliness of mattresses and bed linens, cleanliness of clothing, and open defecation behavior. The dependent variables were the incidence of scabies as determined by clinical data.

RESULTS

Chi-Square Analysis of Personal Hygiene Factors

The Correlation Between Bathing Habits and the Incidence of Scabies

The category of good bathing habits entails taking a bath twice a day and using soap during bathing. If residents do not meet either of these conditions, they are considered to have poor bathing habits (20). The analysis in Table 1 reveals that the case group exhibited

risky bathing habits at 95%, whereas the control group displayed non-risky bathing habits at 56.3%. Residents' bathing habits can be described as poor because many of them do not prioritize the importance of good bathing habits; at times, they bathe only once a day, and some even skip bathing altogether.

Table 1. Bivariate Analysis of the Correlation Between Bathing Habits and Incidence of Scabies in the Institute Rehabilitation Center of Vagrants, Scrounger and Mental Disabilities in South Sumatra Region

Bathing Habits	Scabies Incidence				Total		p-value
	Scabies (people)	%	Non-Scabies (people)	%	n	%	
Risky	76	95.0	35	43.8	111	69.4	0.000
No Risk	4	5.0	45	56.3	49	30.6	
Total	**80**	**100**	**80**	**100**	**160**	**100**	

The results of the statistical test yielded a p-value of 0.000 (p < 0.05), indicating rejection of the null hypothesis (H_0). This suggests that there are significantly more residents with scabies who possess poor bathing habits compared to non-sufferers who maintain good bathing habits, thereby establishing a correlation between bathing habits and the incidence of scabies in the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region.

The Correlation Between Cleanliness of Mattresses and Bed Linen and the Incidence of Scabies

The cleanliness of mattresses and bed linen can be categorized into two groups: changing the bed linen once a week and airing the mattresses under the sun once week. Residents failing to meet these criteria are considered to have poor cleanliness of mattresses and bed linen.

Table 2. Bivariate Analysis of the Correlation Between Cleanliness Mattresses and Bed Linen and Incidence of Scabies in the Institute Rehabilitation Center of Vagrants, Scrounger and Mental Disabilities in South Sumatra Region

Cleanliness Mattresses and Bed Linen	Scabies Incidence				Total		p-value
	Scabies (people)	%	Non-Scabies (people)	%	n	%	
Risky	72	90.0	34	42.5	106	66.3	0.000
No Risk	8	10.0	46	57.5	54	33.8	
Total	**80**	**100**	**80**	**100**	**160**	**100**	

The analysis presented in Table 2 indicates that the case group, which maintained mattress and bed linen hygiene, was at a risk of 90.0%, while the control group, demonstrating mattress and bed linen cleanliness, was not at risk at 57.5%. According to this study, some residents' mattresses and bed linen were deemed unfit for use due to neglect of hygiene practices. However, there were still several residents whose mattresses and bed linen remained suitable for use.

The statistical test results yielded a p-value of 0.000 (p < 0.05), leading to the rejection of the null hypothesis (H_0). This indicates that the case group exhibited poorer hygiene in terms of mattress and bed linen cleanliness compared to the control group, establishing a correlation between the cleanliness of mattresses and bed linen and the incidence of scabies in the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region.

The Correlation Between Cleanliness of Clothing and the Incidence of Scabies

Good cleanliness of clothing can be categorized into two groups: changing clothes twice a day and washing clothes with detergent. Residents are considered to have poor cleanliness of clothing if they do not meet either of these criteria. The analysis presented in Table 3 revealed that the case group exhibited risky clothing hygiene at 90.0%, whereas the control group demonstrated non-risky clothing hygiene at 56.3%. According to this study, the majority of residents only change clothes once a day, with some not changing clothes at all. Interviews with residents revealed that their laundry habits depend on the availability of detergent, with some washing clothes without detergent.

Table 3. Bivariate Analysis of the Correlation Between Cleanliness Cloth and Incidence of Scabies in the Institute Rehabilitation Center of Vagrants, Scrounger and Mental Disabilities in South Sumatra Region

Cleanliness Cloth	Scabies Incidence				Total		p-value
	Scabies (people)	%	Non-Scabies (people)	%	n	%	
Risky	72	90.0	35	43.8	107	49.4	0.000
No Risk	8	10.0	45	56.3	53	50.5	
Total	**80**	**100**	**80**	**100**	**160**	**100**	

The statistical test results yielded a p-value of 0.000 (p < 0.05), leading to the rejection of the null hypothesis (Ho). This indicates that the case group exhibited poorer hygiene in terms of clothing cleanliness compared to the control group, establishing a correlation between clothing cleanliness and the incidence of scabies in the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region.

The Correlation Between Open Defecation Behavior and the Incidence of Scabies

Open defecation behavior is considered poor if residents defecate in locations other than a designated toilet, such as the yard, shrubbery, or other areas. The analysis presented in Table 4 indicates that the case group exhibited risky defecation behavior at 87.5%, whereas the control group demonstrated non-risky defecation behavior at 86.3%. The majority of residents displayed poor defecation behavior, often due to insufficient knowledge about proper sanitation practices, leading them to defecate outside of designated areas.

Table 4. Bivariate Analysis of the Correlation Between Open Defecation Behavior and Incidence of Scabies in the Institute Rehabilitation Center of Vagrants, Scrounger and Mental Disabilities in South Sumatra

Open Defecation Behavior	Scabies Incidence				Total		p-value
	Scabies (people)	%	Non-Scabies (people)	%	n	%	
Risky	70	87.5	11	13.8	81	66.9	
No Risk	10	12.5	69	86.3	79	33.1	0.000
Total	**80**	**100**	**80**	**100**	**160**	**100**	

The statistical test results yielded a p-value of 0.000 ($p < 0.05$), leading to the rejection of H_0. This indicates that the case group exhibited poorer open defecation behavior compared to the control group. Consequently, there is a correlation between defecation behavior and the incidence of scabies in the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region.

Multivariate Analysis

Table 5. Bivariate Analysis of the Correlation of Open Defecation Behavior and Incidence of Scabies in the Institute Rehabilitation Center of Vagrants, Scrounger and Mental Disabilities in South Sumatra Region

Variabel	p-value	OR	*95% Confidence Interval*	
			Lower	*Upper*
Bathing Habits	0.119	2,246	0.680	9.792
Clothing Hygiene	0.359	1,995	0.483	7.475
Cleanliness Mattresses and Bed Linen	0.168	2,331	0.701	7.757
Open Defecation Behaviour	0.000	56,336	17.381	158.500

According to the findings presented in Table 5, multivariate analysis using multiple logistic regression tests revealed that open defecation behavior was the primary personal hygiene factor influencing the incidence of scabies in the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region. The obtained *p-value* of 0.000 (< 0.005) and OR (Odds Ratio) of 56.336 indicate that respondents with poor open defecation behavior are significantly more likely to experience scabies, even after controlling for bathing habits (p-value = 0.119 > 0.005 and OR = 2.246), cleanliness of mattresses and bed linen (p-value = 0.168 > 0.005 and OR = 2.331), and clothing hygiene (p-value = 0.359 > 0.005 and OR = 1.995).

DISCUSSIONS

Bathing Habits and the Incidence of Scabies

The outcomes of the statistical test, based on the chi-square test, revealed a *p-value* of 0.000 (OR = 24.429), leading to the rejection of the null hypothesis (H_0). This indicates a significant correlation between bathing habits and the incidence of scabies in the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region. Additionally, multivariate analysis through multiple logistic regression showed an OR value of 24.429, indicating that risky bathing habits can increase the risk of scabies events by 24,429 times in the mentioned region. These results align with previous research conducted in the Pagat's Health Center Work area, which also found a significant correlation between bathing habits and scabies incidence. Insufficient bathing frequency, less than twice a day, can compromise skin cleanliness, potentially leading to scabies outbreaks (21-25). Furthermore, the use of soap during bathing is crucial, as its absence can leave the skin susceptible to bacterial growth, including scabies mites (26). However, our findings contrast with a previous study conducted at the Institute of Child Special Development, which reported no significant correlation between bathing habits and the incidence of scabies (27). This study indicates that the bathroom conditions were adequate, prompting the residents to take regular baths, typically twice a day. However, the residents still used communal soap, and this practice did not correlate with the incidence of scabies at the Institute of Child Special Development. Poor bathing habits increase the risk of bacterial proliferation on the skin, including scabies mites, allowing them to thrive and multiply (28).

Scabies mites, also known as *Sarcoptes scabiei var. hominis*, are transmitted through the skin, causing symptoms of scabies. The condition can worsen if bathing habits are consistently poor, such as infrequent bathing, leading to persistent sweating and moisture on the skin (29). Maintaining good bathing habits is essential for eliminating odor, stimulating blood circulation and nerves, relaxing muscles, and providing a sense of freshness to the body. Bathing should ideally be done at least twice a day, before meals and rest (30). However, there are effects associated with bathing habits, such as

an increase in the number of eggs laid by female mites. Interestingly, this increase does not significantly differ between individuals who bathe daily and those who do not bathe for up to two months (31).

Cleanliness of Mattresses and Bed Linen and the Incidence of Scabies

The statistical results, based on the chi-square test, revealed a *p-value* of 0.000 (OR = 12.176), indicating the rejection of the null hypothesis (H_0). This suggests a significant correlation between mattress and bed linen cleanliness and the incidence of scabies at the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region. Multivariate analysis using multiple logistic regression further demonstrated an odds ratio (OR) of 12.176, signifying that poor cleanliness of mattresses and bed linen could increase the risk of scabies events by 12.176 times within the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region. These findings align with previous research, which highlighted a significant correlation between the cleanliness of mattresses and bed linen and the incidence of scabies at Correctional Institute (LAPAS) II A Pekan Baru. This research indicated that scabies spread predominantly due to prisoners frequently sharing beds without changing bed sheets weekly or airing mattresses under the sun, leading to the accumulation of dust containing various bacteria, germs, and viruses, including scabies mites, which infiltrate the pores of the mattress and bed linen (32).

This study contrasts with previous research, which stated that there was no correlation between the cleanliness of mattresses and bed linen and the incidence of scabies at Correctional Institute (LAPAS) IIB Cianjur. The previous study noted that prisoners often dried the mattresses once a week and changed the bed linen once a week, suggesting that these practices could prevent scabies in most individuals (33). Scabies mites typically transmit during sleep, as there is direct contact with mattresses and bed sheets, leading to symptoms such as severe itching that greatly disturbs residents affected by scabies incidents (34).

The Correlation Between Cleanliness of Clothing and the Incidence of Scabies

The statistical outcomes, based on the chi-square test, revealed a *p-value* = 0.000 (OR = 11.571), indicating the rejection of H_o. This signifies a significant correlation between clothing hygiene and the incidence of scabies at the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region. Additionally, residents have been observed wearing clothes without immediately washing or changing them. Multivariate analysis using multiple logistic regression indicated an odds ratio (OR) of 11.571, suggesting that poor cleanliness of clothing increases the risk of scabies events by 11.571 times within the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region. This study is consistent with previous research, which also found a significant correlation between clothing cleanliness and the incidence of scabies at Correctional Institute Kelas I Cirebon. The research highlighted that inadequate clothing cleanliness, failure to change dirty clothes, and washing clothes without detergent can lead to various skin diseases, including scabies (35). Additionally, residents sometimes exchange clothes with each other. This aligns with a theory asserting that clothes play a significant role in the indirect transmission of scabies mites through contact (36).

However, the findings of this study contradict previous research that found no significant correlation between clothing hygiene and the incidence of scabies at Child Correctional Institute Klas 1 Kota Kupang. This study noted that prisoners' clothing cleanliness was satisfactory, but they occasionally shared clothes with friends. Fortunately, they changed clothes twice a day and washed them with detergent (37).

Poor cleanliness of clothing can lead to scabies as clothes can absorb sweat, becoming damp and dirty, facilitating bacterial growth, including scabies mites (38). In such conditions, scabies mites can indirectly transmit through the skin, leading to early symptoms such as excessive itching and skin lesions, eventually developing into scabies (39).

Open Defecation Behavior and the Incidence of Scabies

The statistical outcomes, derived from chi-square tests, yielded a *p-value* of 0.000 (OR = 43.909), leading to the rejection of H_o. This indicates a significant correlation between defecation behavior and the incidence of scabies in PSR-GPODGJ South Sumatra Region. Further multivariate analysis revealed an odds ratio (OR) value of 43.909, suggesting that risky open defecation behavior could increase the risk of scabies incidence by 43.909 times within The Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in South Sumatra Region.

The results of the multivariate analysis presented in Table 5 identified defecation behavior as the dominant variable affecting the incidence of scabies, with a *p-value* of 0.000 and OR = 56.336. This implies

that occupants with poor open defecation behavior are at a significantly higher risk of scabies events by 56.336 times within the Institute Rehabilitation Center of Homeless, Beggars, and Mental Disabilities in South Sumatra Region, even after controlling for bathing habits (p-value = 0.119 and OR = 2.246), hygiene of mattresses and bed linen (p-value = 0.168 and OR = 2.331), *and* hygiene of clothes (p-value = 0.359 and OR = 1.995).

This aligns with previous research that has highlighted a correlation between defecation behavior and the incidence of scabies in *Northwest Ethiopia*. The study indicates that open defecation is still prevalent in this region. Engaging in careless defecation practices can serve as a catalyst for scabies transmission, fostering the proliferation of bacteria and disease vectors, ultimately leading to various diseases, including scabies (40). Bacteria commonly found in feces, such as Streptococcus pyogenes and Staphylococcus aureus, can contribute to the development of crusted scabies. Particularly in tropical climates, Streptococcus pyogenes can escalate, potentially causing other diseases such as acute rheumatic fever and rheumatic heart disease (41). Crusted scabies can harbor millions of mites due to unhindered multiplication (42). Complications arising from bacteria, notably Streptococcus pyogenes and Staphylococcus aureus, are particularly prevalent in children who lack awareness about the dangers of open defecation behavior (43). Skin infections caused by bacteria can sometimes lead to kidney inflammation known as post-streptococcal glomerulonephritis (44).

ACKNOWLEDGMENTS

The author would like to express gratitude to all the health workers at the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region for their invaluable assistance during the interviews and guidance provided over the course of two months. Additionally, heartfelt thanks are extended to all the respondents who willingly participated without any coercion.

CONCLUSION

Personal hygiene, including bathing habits, cleanliness of mattresses and bed linen, cleanliness of clothing, and open defecation behavior, correlates with the incidence of scabies at the Institute Rehabilitation Center of Vagrants, Scroungers, and Mental Disabilities in the South Sumatra Region. According to multivariate analysis, open defecation behavior emerges as the most influential factor or independent variable affecting scabies incidence. Consequently, health workers must provide education and counseling to all residents regarding the importance of personal hygiene. Specifically, they must emphasize the risks associated with poor personal hygiene practices and the dangers of engaging in unsanitary open defecation behavior.

REFERENCES

1. Amare HH, Lindtjorn B. Risk Factors for Scabies, Tungiasis, and Tinea Infections among School Children in Southern Ethiopia: A Cross-Sectional Bayesian Multilevel Model. *Plos Neglect Trop*. 6(1):1–22. https://doi.org/10.1371%2Fjournal.pntd.0009816
2. Murray RL, Crane JS. Scabies. Florida: StatPearls Publishing; 2023. https://www.ncbi.nlm.nih.gov/books/NBK544306/
3. Chandler DJ, Fuller LC. A Review of Scabies: An Infestation More than Skin Deep. *Dermatology*. 2019;235(1):79–90. https://doi/org/10.1159/000495290
4. Moroni B, Rossi L, Bernigaud X. Zoonotic Episodes of Scabies: A Global Overview. *Pathogens MDPI*. 2022;11(2):213–2162. https://doi.org/10.3390%2Fpathogens11020213
5. Niode NJ, Adji A, Gazpers S. Crusted Scabies, a Neglected Tropical Disease: Case Series and Literature Review. *Infection Disease Reports*. 2022;14(1):479–91. https://doi.org/10.3390/idr14030051
6. Palaniappan V, Gopinath H, Kaliaperumal K. Crusted Scabies. *ASTMH*. 2021;104(3):787–788. https://doi.org/10.4269/ajtmh.20-1334
7. Richards RN. Scabies: Diagnostic and Therapeutic Update. *Journal of Cutaneous Medicine and Surgery*. 2020;25(1):1–8. https://doi.org/10.1177/1203475420960446
8. Engelman D, Cantey PT, Marks M, Solomon AW. The Public Health Control of Scabies: Priorities for Research and Action. *The Lancet*. 2019;394(10192):81–92. https://doi.org/10.1016/S0140-6736(19)31136-5
9. World Health Organization. Scabies. Geneva: World Health Organization; 2020. https://www.who.int/health-topics/scabies#tab=tab_1
10. World Health Organization. Scabies. Geneva: World Health Organization; 2023. https://www.who.int/news-room/fact-sheets/detail/scabies
11. El-Moamly AA. Scabies as a Part of the World Health Organization Roadmap for Neglected Tropical Diseases 2021-2030: What We Know and What We Need to Do for Global Control. *Tropical Medicine and Health*. 2021;49(64):2–11. https://doi.org/10.1186/s41182-021-00348-6
12. Tsoi SK, Lake SJ, Thean LJ, Mathews A. Estimation of Scabies Prevalence Using Simplified Criteria and Mapping Procedure in Three Pacific and Southeast Asian Countries. *BMC Public Health*. 2021;21(2060):1–10. https://doi.org/10.1186/s12889-021-12039-2
13. Trasia RF. Pemilihan Skabisida dalam Pengobatan Skabies. *Journal of Pharmaceutical and Sciences*. 2020;3(2):58–63. http://dx.doi.org/10.36490/journal-jps.com.v3i2.41

14. Hayun Z, Fermanda Fitri Wulandari. Hubungan Personal Hygiene Dengan Kejadian Demam Tyhpoid di Rumah Sakit Bhayangkara Palembang 2019. *Jurnal Kesehatan : Jurnal Multi Ilmiah Sciences*. 2021;3(2):72–80. https://doi.org/10.52395/jkjims.v11i01.325
15. Social Rehabilitation Institutions of Sumatera Selatan. Data Kejadian Penyakit Skabies di Panti Sosial Rehabilitasi Gelandangan, Pengemis dan Orang Dengan Gangguan Jiwa Provinsi Sumatera Selatan. Palembang: Social Rehabilitation Institutions of Sumatera Selatan;2022.
16. Kesumawardani G, Pawenang ET. Kesadaran Berperilaku Hidup Bersih dan Sehat dengan Kejadian Skabies pada Warga Binaan di Rutan. *Indonesian Journal of Public Health and Nutrition*. 2022;2(3):311–318. https://doi.org/10.15294/ijphn.v2i1.51760
17. Gumilang R, Farakhin N. Hubungan Personal Hygiene dengan Kejadian Penyakit Skabies pada Santri di Pondok Pesantren Al-Hikam Bangkalan. *JSK*. 2021;6(2):80–84. https://doi.org/10.24198/jsk.v6i2.48527
18. Social Rehabilitation Institutions of Sumatera Selatan. Data Kondisi Lingkungan PSR-GPODGJ 2022. Palembang: Social Rehabilitation Institutions of Sumatera Selatan.
19. Andrade C. Research Design: Case-Control Studies. *Indian Journal of Psychological Medicine*. 2022;44(3):307–309. https://doi.org/10.1177/02537176221090104
20. Theresiana Y, Nurjanah NAL, Wulandari. Hubungan Antara Perilaku Hidup Bersih dan Sehat (PHBS) Serta Lingkungan Sehat Dengan Kejadian Scabies di Kabupaten Banyuasin. *JNPH*. 2023;11(2):554–564. https://jurnal.unived.ac.id/index.php/jnph/article/download/5222/3801/
21. Tuharea SF, Wakano A, Rumakey RS. Hubungan Personal Hygiene dengan Kejadian Skabies pada Masyarakat Pesisir di Apui RT 06 Kelurahan Ampera Kecamatan Kota Masohi. *Jurnal Keperawatan Indonesia Timur*. 2021;1(1):22–31. https://www.jurnalpoltekkesmaluku.com/index.php/JKIT/article/view/234/69
22. Hamzah B, Akbar H. Analisis Hubungan Personal Hygiene Dengan Kejadian Skabies di Wilayah Kerja Puskesmas Juntinyuat Kabupaten. *Uwigama Jurnal Kesehatan Masyarakat.* 2020;6(1):22–29. https://journal.uwgm.ac.id/index.php/KESMAS
23. Misganaw B, Nigatu SG, Kibret AA. Prevalence and Determinants of Scabies Among School-Age Children in Central Armachiho District, Northwest, Ethiopia. *PLOS ONE*. 2022;10(1):1–14. https://doi.org/10.1371/journal.pone.0269918
24. Sauerbrei W, Perprouglou A, Schmid M, Becher H. State of the Art in Selection of Variables and Functional forms in Multivariable Analysis—Outstanding Issues. *Diagnostic and Prognostic Research*. 2020;4(3):1–18. https://doi.org/10.1186/s41512-020-00074-3
25. Mentaya E, Noraida, Khair A. Penyakit Skabies Berhubungan dengan Personal Hygiene Masyarakat. *Jurnal Kesehatan Lingkungan*. 2020;17(1):1–4. https://doi.org/10/31964/jkl.v17i1.172
26. Suryati I, Primal D, Sari PA. Hubungan Pengetahuan dan Kebersihan Diri dengan Risiko Kejadian Skabies di Panti Asuhan. *PREPOTIF Jurnal Kesehatan Masyarakat*. 2022;6(3):2484–2490. https://doi.org/10.31004/prepotif.v6i3.8373
27. Ariningtyas, Nuraini D. Analisis Karakteristik dan Higiene Individu dengan Kejadian Skabies di Lembaga Pembinaan Khusus Anak (LPKA) Kelas I Blitar. *Jurnal Keperawatan Muhammadiyah*. 2019;1(2):225-231. http://journal.um-surabaya.ac.id/index/php/JKM
28. Hamzah B, Akbar H. Analisis Hubungan Personal Hygiene dengan Kejadian Skabies di Wilayah Kerja Puskesmas Juntinyuat Kabupaten Indramayu. *Jurnal Kesmas Uwigama* . 2020;6(1):24–29. https://doi.org/10.24903/kujkm.v6i1.854
29. Gultom TB, Indarwati S. Pengaruh Personal Hygiene dan Sanitasi Lingkungan terhadap Penyakit Scabies pada Warga Binaan Pemasyarakatan (WBP) di Rumah Tahanan (RUTAN) Kelas I Bandar Lampung Propinsi Lampung Tahun 2020. *Jurnal Dunia Kesmas*. 2022;11(2):303–314. https://doi.org/10.33024/jdk.v11i2.6858
30. Triana W, Razi F. Faktor yang Berhubungan dengan Perilaku Pencegahan Penyakit Scabies pada Santri di Pondok Pesantren Nurul Iman Ulu Gedong Kota Jambi Tahun 2019. *JAMHESIC*. 2020;3(1):93–97. https://online-journal.unja.ac.id/kedokteran/article/download/12898/11015/35234
31. Maharani R, Sukendra DM. Personal Hygiene Sebagai Prediktor Penyakit Skabies pada Santri di Kelurahan Kalibeber, Mojotengah, Wonosobo. *Jurnal Kesehatan Masyarakat*. 2023;11(1):12–20. https://doi.org/10.14710/jkm.v11i1.36956
32. Hayana, Vermita WS, Sarwandi J. Hubungan Personal Hygiene Narapidana Laki-laki dengan Kejadian Penyakit Dermatitis di Lembaga Pemasyarakatan (LAPAS) Kelas II A Pekanbaru. *Avicenna*. 2021;16(3):141-148. https://doi.org/10.36085/avicenna.v16i3.2176
33. Firmansyah IR. Analisis Personal Hygiene dan Kondisi Sanitasi Narapidana pada Lapas Klas IIB Cianjut. *Jurnal Kesehatan Masyarakat.* 2020;6(1):64-69. http://dx.doi.org/10.35329/jkesmas.v6i1
34. Rahmawati AN, Hestiningsih R, Wuryanto MA, Martini. Hubungan Personal Hygiene dengan Kejadian Skabies pada Santri Pondok Pesantren X Semarang. *Jurnal Ilmiah Mahasiswa*. 2021;11(1):21–24. https://ejournal.undip.ac.id/index.php/jim/article/view/35019
35. Mauliddah SR, Nurhardiyanti S, Hamdan. Hubungan Lingkungan Fisik, Tingkat Pengetahuan dan Personal Hygiene Warga Binaan Pemasyarakatan Terhadap Skabies di Rumah Tahanan Kelas I Cirebon Tahun 2023. *Journal of Health Research Science*. 2023;3(02):215–226. https://doi.org/10.34305/JHRS.V3I02.967
36. Carolyne RN, Lubis NL, Nurmaini. Relationship between Knowledge, Clothing Cleanliness, Towel

Cleanliness and Environmental Sanitation with Scabies Incidents at the Pekanbaru City Child Special Development Institute (LPKA) in 2019. *BIRCI-Journal*. 2021;4(1):122–130. https://doi.org/10.33258/birci.v4i1.1542

37. Djata IMR, Setyobudy A, Hinga IAT. Gambaran Sanitasi Lingkungan dan Hygiene Perseorangan dengan Kejadian Penyakit Kulit di Lapas Anak Kota Kupang. *SEHATMAS*. 2022;1(4):486–496. https://doi.org/10.55213/sehatmas.v1i4.842
38. Hidayat UA, Hidayat AAS, Bahtiar Y. Hubungan Tingkat Pengetahuan tentang Scabies dengan Kejadian Penyakit Scabies pada Santri Manbaul Ulum. *Jurnal Keperawatan Galuh*. 2022;4(2):33–38. http://dx.doi.org/10.25157/jkg.v4i2.7817
39. Alhidayati, Syukaisih, Amalia R, Sukma I. Faktor yang Berhubungan dengan Penyakit Skabies pada Siswa Asrama di SMKN Pertanian terpadu Provinsi Riau. *Avicenna*. 2020;15(2):74–157. https://dx.doi.org/10.36085/avicenna.v15i2.796
40. Nigusie A, Gizaw Z, Gebrehiwot M, Destaw B. Vector-Borne Diseases and Associated Factors in The Rural Communities of Northwest Ethiopia: A Community-Based Cross-Sectional Study. *Environ Health Insights*. 2021;15(1):1–8. https://doi.org/10.1177/11786302211043049
41. Mika A, Reynolds SL, Pickering D. Complement Inhibitors from Scabies Mites Promote Streptococcal Growth - A Novel Mechanisn in Infected Epidermis. *Plos Neglect Trop*. 2018;6(7):1563–1570. https://doi.org/10.1371%2Fjournal.pntd.0001563
42. Sunderkotter C, Wohlrab J, Hamm H. Scabies: Epidemiology, Diagnosis, and Treatment. *Continuing Medical Education*. 118(1):695–704. https://doi.org/10.3238/arztebl.m2021.0296
43. Zara N. Knowledge and Behavior Aspect Related to Scabies Incidence in Syamtalira Bayu Health Center, Northern Aceh Regency. *NASET Journal*. 2022;2(1):53–56. https://doi.org/10.37275/nasetjournal.v2i1.13
44. Centers for Disease Control and Prevention. Parasites - Scabies. United States: Centers for Disease Control and Prevention; 2010. https://www.cdc.gov/parasites/scabies/disease.html