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Determinants of Skin Disease Complaints in Informal Shellfish Workers: A Study from Cinta Damai Village

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ABSTRACT

Clam processing workers often receive limited attention in occupational health discussions, particularly concerning skin disease complaints, which are strongly suspected of being associated with inadequate personal hygiene practices. This study aimed to examine the effect of personal hygiene on skin disease complaints among clam processing workers. Quantitative research design was employed using a cross-sectional approach. The study involved 67 respondents, selected through total sampling. Data was analyzed using univariate, bivariate, and multivariate methods, with logistic regression applied for multivariate analysis. The results indicated that, after controlling for other variables, skin hygiene as well as nail and hand hygiene were significant factors influencing skin disease complaints. Although hair hygiene was not statistically significant, the relationship trend suggested that individuals with poor hair hygiene had a 7.9 times higher likelihood of experiencing skin-related complaints. Among all variables, skin hygiene emerged as the most influential factor, with an Exp(B) value of 34.869, suggesting that workers with poor skin hygiene were 34.869 times more likely to report skin diseases compared to those with good skin hygiene. The model explained 79.7% of the variance in skin disease complaints, indicating a strong influence of personal hygiene. These findings underscore the critical role of personal hygiene in preventing occupational skin diseases among clam processing workers.

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Introduction

Public health problems in developing countries continue to be significantly influenced by diseases related to poor personal hygiene. This condition arises from the interplay between human behavior, environmental factors, and social conditions that contribute to the spread of disease [1]. According to H.L. Blum's health field theory (2011), four main factors determine public health outcomes: lifestyle or behavioral factors, environmental conditions, genetic predispositions, and the availability of health services.

Among the major health concerns globally (and in Indonesia in particular), skin diseases remain a prominent issue. These conditions are caused by various microorganisms, including viruses, bacteria, fungi, and parasites. Skin diseases represent the most frequently encountered type of infection, surpassing many other health disorders, and are estimated to affect approximately 900 million people worldwide. Research indicates that the prevalence of skin diseases in developing countries is notably high, ranging from 20% to 80% [2].

In Indonesia, skin diseases account for approximately 4.60% to 12.95% of all reported illnesses, ranking third among the top ten most common diseases nationally [3]. In North Sumatra, the prevalence is even higher, reaching 27.5% [4]. According to data from the Medan City Health Office, skin diseases are among the ten most frequently reported conditions, ranking seventh with a total of 19,513 cases, representing 3.94% of all cases in the region [5].

At the local level, data from the Tanjung Rejo Health Center in Percut Sei Tuan Subdistrict show that skin diseases ranked fifth in 2021, with a total of 6,036 cases. This number decreased to 3,017 cases in 2022 and further to 2,107 cases in 2023. However, in Cinta Damai Village, skin diseases were the ninth most common illness in 2023, with 12 recorded cases. By 2024, this number had sharply increased, making skin diseases the fifth most reported condition, with 124 cases, including dermatitis, scabies, and fungal infections.

Work involving shellfish processing is a form of informal sector employment commonly carried out in places such as traditional markets and seafood processing facilities. Workers in this field face a high risk of occupational accidents and diseases due to exposure to sharp tools, unsanitary working conditions, and chemicals used during processing [6]. One common occupational disease in this context is skin disease. Globally, the prevalence of occupational skin diseases is estimated to be around 10%, with symptoms such as fever, sudden rashes, itching, a burning sensation, and fatigue [7]. As a condition that affects the body’s largest organ, skin disease can arise from various factors, including individual lifestyle and environmental hygiene. It is more likely to develop when personal hygiene and environmental sanitation are poorly maintained [8].

Shells can be a source of skin disease complaints as they often harbor various pathogenic microorganisms, including bacteria, fungi, and viruses originating from the marine environment [9]. Additionally, the rough and sharp surfaces of shells can cause minor cuts or microtraumas on the hands of workers. These small wounds may serve as entry points for pathogens that lead to skin infections, such as contact dermatitis, bacterial infections (e.g., *Staphylococcus aureus*), and fungal infections. Prolonged exposure to damp conditions, frequent contact with seawater, and inadequate hand hygiene further heighten the risk of skin irritation and infection. As a result, workers involved in shellfish processing are particularly vulnerable to skin disease complaints due to continuous exposure to seawater, microorganisms, and abrasive shell surfaces, all of which contribute to irritation, infection, and other skin-related disorders.

Based on interviews with 15 workers in Percut Sei Tuan Sub-district, it was found that the rough surface of shells can cause itching and skin irritation upon contact. The processing is performed using sharp tools such as small knives, which require precision to prevent injuries. However, most workers do not use adequate personal protective equipment (PPE), such as gloves or protective clothing. Additionally, poor nail hygiene, including long and discolored nails, can serve as a breeding ground for infection-causing bacteria. Nine out of the 15 workers reported experiencing skin disorders, such as red spots, blotches, and itching, particularly on their hands and feet. This condition poses a risk of reduced work productivity due to the physical discomfort it causes.

Skin diseases are closely linked to personal hygiene practices. Personal hygiene refers to the efforts made by individuals or groups to maintain health through cleanliness and self-care. This concept emphasizes the importance of maintaining cleanliness, which should be practiced by everyone. Proper personal hygiene in daily life plays a crucial role in directly influencing an individual's health status [10]. Key aspects of personal hygiene include the care of skin, hair, teeth, eyes, ears, as well as hands, feet, and nails. Therefore, maintaining good personal hygiene is essential for disease prevention and is particularly important for workers handling shellfish to reduce the risk of occupational skin diseases.

Based on this background, the researcher aims to conduct a detailed study on the effect of personal hygiene on skin disease complaints among workers in Cinta Damai Village, Percut Sei Tuan District. Although the exact impact of personal hygiene on skin problems is not yet fully understood, there are indications that poor hygiene practices significantly contribute to skin health issues among these workers. This research is expected to provide valuable insights and support the development of more effective strategies to improve their well-being and health in the workplace, promoting safer and more hygienic working conditions.

Literature Review

Shellfish workers frequently experience skin disease complaints due to direct contact with rough and sharp shell surfaces, constant exposure to moist seawater, and the risk of infection from microorganisms present on the shells. This situation is worsened by inadequate use of personal protective equipment and poor hand and nail hygiene, which increases the likelihood of skin irritation, injury, and infection. A study conducted in Ningbo, China, reported that 50.5% of seafood workers suffered from hand dermatitis, while 26.1% experienced superficial fungal infections on their hands. Key risk factors identified included not wearing waterproof gloves, prolonged working hours, and extended work experience in the seafood industry [11].

Personal hygiene is an important factor influencing skin disease complaints, as poor hygiene can lead to the buildup of dirt, sweat, and pathogenic microorganisms on the skin's surface. This accumulation may result in irritation, bacterial or fungal infections, and skin inflammation. A study conducted at *Pondok Pesantren* Modern Al-Kautsar Pekanbaru found that poor personal hygiene, especially regarding skin care and hand and toenail hygiene, was significantly associated with skin diseases such as scabies. The odds ratio for poor skin hygiene was 8.795, and for hand and toenail hygiene, it was 10.667, indicating a substantial increase in risk [12]. Similarly, research in the Juntinyuat Health Center area showed that personal hygiene and type of work were related to the incidence of dermatitis. The p-value for personal hygiene was 0.015, demonstrating a significant association with dermatitis occurrence [13].

Maintaining good personal hygiene, including regular handwashing, bathing, and keeping nails and hair clean, is essential for preventing skin disease complaints, especially among individuals working in environments with a high risk of contamination [14]. A study conducted in Pulau Buluh, Batam, found a significant relationship between personal hygiene and complaints of contact dermatitis among fishermen. The study indicates that poor personal hygiene increases the risk of contact dermatitis in workers within the fisheries sector [15].

Material and Methods

This study aims to determine the effect of personal hygiene on skin disease complaints among workers involved in shellfish processing using quantitative methods with a cross-sectional approach. The population consisted of all 67 workers at the research site. Total sampling was used, meaning all workers were included in the study. The independent variables were aspects of personal hygiene, including skin hygiene, clothing hygiene, hair hygiene, and hand and nail hygiene. The dependent variable was skin disease complaints, assessed through interviews and direct observation of the workers.

The research instrument (see appendix) was a yes/no questionnaire that had been validated and tested for reliability. Responses of 'yes' were scored as 1, and 'no' as 0. For the Hygiene parameters, an overall score above the median was classified as 'Good.' Regarding the Skin Disease parameter, respondents were considered to have skin disease complaints if they answered 'yes' to at least one of the skin disease-related questions. Primary data were collected through interviews and direct observation. Data analysis involved univariate, bivariate, and multivariate analyses, with logistic regression applied to identify factors influencing skin disease complaints while controlling for other variables. The study was conducted from November 2024 to January 2025 and received research and ethics approval from the Tanjung Rejo Health Center UPT Health Office, permit number 077/PUSK-TR/ADM/1/2025.

Results

The findings of this study are presented through three types of analyses: univariate, bivariate, and multivariate, with results summarized in tables.

A. Univariate Analysis

Univariate analysis was conducted to describe the distribution of respondents based on their characteristics, personal hygiene, and skin disease complaints. Table 1 shows that the majority of respondents were female (74.6%) and most were between the ages of 31 and 45 years (52.2%), indicating a predominantly middle-aged female workforce. Regarding work experience, the largest group had been employed for 4 to 6 years (41.8%), suggesting moderate exposure time to occupational conditions. Most respondents worked 5 to 8 hours per day (58.2%) and 4 to 5 days per week (49.3%), representing typical full-time work schedules. This demographic and work pattern provides context for understanding exposure risks related to skin disease.

Table 1. Respondent characteristics.

Characteristics	Frequency	Percentage
Gender		
Male	17	25.4
Female	50	74.6
Age		
15 – 30	16	23.9
31 – 45	35	52.2
46 – 60	16	23.9
Period of Employment		
1 – 3 years	11	16.4
4 – 6 years	28	41.8
7 – 10 years	20	29.9
> 10 years	8	11.9

Characteristics	Frequency	Percentage
Working Hours		
< 5 hours	8	11.9
5 – 8 hours	39	58.2
> 8 hours	20	29.9
Weekly Working Days		
1 – 3 days	8	11.9
4 – 5 days	33	49.3
6 – 7 days	26	38.8

Table 2 reveals that more than half of the respondents had poor skin hygiene (52.2%) and clothing hygiene (52.2%), indicating common shortcomings in these personal hygiene aspects. While hair hygiene was generally good for 52.2% of the respondents, poor nail and hand hygiene was found in 58.2%, a significant concern given that hands are directly exposed to irritants and pathogens in this work environment. Overall, 56.7% of respondents demonstrated poor personal hygiene practices. Correspondingly, 59.7% of respondents reported experiencing skin disease complaints, highlighting a substantial burden of skin-related health issues among the workers. This suggests a strong link between personal hygiene and the prevalence of skin complaints.

Table 2. Distribution of respondents based on personal hygiene and skin disease complaints.

Characteristics	Frequency	Percentage
Skin Hygiene		
Good	32	47.8
Poor	35	52.2
Clothing Hygiene		
Good	32	47.8
Poor	35	52.2
Hair Hygiene		
Good	35	52.2
Poor	32	47.8
Nail and Hand Hygiene		
Good	28	41.8
Poor	39	58.2
Overall Personal Hygiene		
Good	29	43.3
Poor	38	56.7
Skin Disease Complaints		
Yes	40	59.7
No	27	40.3

Table 3 details the types of skin complaints reported by the 40 respondents who experienced such issues. The most common symptom was itching in the last six months, reported by 87.5% of these workers, followed closely by skin redness and painful wounds, each reported by 80.0%.

Other prevalent complaints included wound formation after blister rupture (75.0%), scaly and dry skin (72.5%), and skin puckering after blister drying (72.5%). These symptoms indicate both acute irritation and possible chronic damage to the skin, likely resulting from ongoing exposure to irritants, poor hygiene, and minor injuries sustained during work.

Table 3. Types of skin complaints experienced by workers (n = 40).

Complaint	Yes	No	Percentage (%)
Itching in the last 6 months	35	5	87.5
Itching during the day	26	14	65.0
Itching at night	21	19	52.5
Itching all over the body	13	27	32.5
Skin redness	32	8	80.0
Small vesicles or blisters	20	20	50.0
Wound formation after blister rupture	30	10	75.0
Wound pain	29	11	72.5
Painful wounds	32	8	80.0
Burning sensation in wounds	21	19	52.5
Skin puckering after blister drying	29	11	72.5
Scaly and dry skin	29	11	72.5
Thickened skin	27	13	67.5
Cracked and chapped skin	23	17	57.5
Skin blisters	23	17	57.5

B. Bivariate Analysis

Bivariate analysis was conducted to examine the relationship between variables such as skin hygiene, clothing hygiene, hair hygiene, nail and hand hygiene, and overall personal hygiene with complaints of skin diseases.

Table 4 shows the relationship between personal hygiene and skin disease complaints among workers involved in shellfish processing. The analysis revealed that skin hygiene has a significant relationship with skin disease complaints, with a p-value less than 0.001 and a prevalence ratio (PR) of 28.438 (95% confidence interval [CI]: 4.091–197.676). This means that workers with poor skin hygiene are approximately 28 times more likely to experience skin disease complaints compared to those with good skin hygiene.

Similarly, clothing hygiene showed a significant association with skin disease complaints ($p < 0.001$), with a PR of 8.750 (95% CI: 2.912–26.295). This indicates that workers with poor clothing hygiene are nearly nine times more likely to report skin disease complaints than those with good clothing hygiene.

Hair hygiene was also significantly associated with skin disease complaints ($p < 0.001$), with a PR of 11.429 (95% CI: 2.939–44.446). Workers with poor hair hygiene were about eleven times more likely to have skin disease complaints compared to those with good hair hygiene.

Nail and hand hygiene showed a significant relationship as well ($p < 0.001$), with a PR of 4.875 (95% CI: 2.265–10.492), meaning that poor nail and hand hygiene increases the likelihood of skin disease complaints by nearly five times.

Finally, overall personal hygiene was significantly associated with skin disease complaints ($p = 0.012$), with a PR of 1.781 (95% CI: 1.110–2.858). This suggests that workers with poor personal hygiene are about 1.8 times more likely to experience skin disease complaints compared to those with good personal hygiene.

These results indicate that poor hygiene in various areas significantly increases the risk of skin disease complaints among workers. Improving personal hygiene practices may therefore be an important strategy in reducing occupational skin health problems.

Table 4. Relationship between personal hygiene and skin disease complaints.

Variable	Group	Skin Disease Complaints		Total	P-value	Prevalence Ratio (95% CI)
		None (n, %)	Available (n, %)	N (%)		
Skin Hygiene *	Good	26 (38.8%)	6 (9.0%)	32 (47.8%)	<0.001	28.438 (4.091-197.676)
	Poor	1 (1.5%)	34 (50.7%)	35 (52.2%)		
Clothing Hygiene *	Good	24 (35.8%)	8 (11.9%)	32 (47.8%)	<0.001	8.750 (2.912 – 26.295)
	Poor	3 (4.5%)	32 (47.8%)	35 (52.2%)		
Hair Hygiene *	Good	25 (37.3%)	10 (14.9%)	35 (52.2%)	<0.001	11.429 (2.939 – 44.446)
	Poor	2 (3.0%)	30 (44.8%)	32 (47.8%)		
Nail and Hand Hygiene *	Good	21 (31.3%)	7 (10.4%)	28 (41.8%)	<0.001	4.875 (2.265-10.492)
	Poor	6 (9.0%)	33 (49.3%)	39 (58.2%)		
Overall Personal Hygiene *	Good	17 (25.4%)	12 (17.9%)	29 (43.3%)	0.012	1.781 (1.110-2.858)
	Poor	10 (14.9%)	28 (41.8%)	38 (56.7%)		

*Note: *$p \leq 0.05$, significant

C. Multivariate Analysis

Multivariate analysis was conducted to examine the simultaneous effect of independent variables on the dependent variable. This approach helps identify which variables have a significant influence after adjusting for the effects of other factors. Variables with a p-value less than 0.25 in the bivariate analysis were included in the multivariate model. Variables with p-values equal to or greater than 0.05 were gradually removed from the model unless their removal caused a change of 10% or more in the odds ratios of other variables, in which case they were retained as confounders.

Table 5. Final multivariate model.

Variable	B	Sig	Exp (B)	95% Confidence Interval
Skin Hygiene	3.552	0.005	34.869	2.869 – 423.830
Hair Hygiene	2.071	0.099	7.929	0.679 – 92.953
Nail and Hand Hygiene	2.454	0.015	11.637	1.624 – 83.374
Constant	-10.976			
Omnibus Test: 0.000				**Nagelkerke R Square: 0.797**

The omnibus test for the model was highly significant (p = 0.000), indicating that the model fits the data well. The Nagelkerke R Square value of 0.797 shows that approximately 79.7% of the variation in skin disease complaints can be explained by the variables included in the model.

Among the variables studied, skin hygiene was the strongest predictor of skin disease complaints, with an odds ratio of 34.869 (95% CI: 2.869 – 423.830). This means that individuals with poor skin hygiene are nearly 35 times more likely to experience skin disease complaints than those with good skin hygiene. Nail and hand hygiene also had a significant effect, with an odds ratio of 11.637 (95% CI: 1.624 – 83.374), indicating that poor nail and hand hygiene increases the likelihood of skin disease complaints by more than eleven times. Hair hygiene showed a higher odds ratio of 7.929 (95% CI: 0.679 – 92.953), but this association was not statistically significant (p = 0.099).

Overall, the multivariate analysis highlights the critical importance of maintaining good skin and hand hygiene in reducing the risk of skin disease complaints among workers.

Discussions

The study found that 59.7% of workers reported skin disease complaints, indicating that a significant proportion of individuals in this occupation experience skin-related health issues. After adjusting for other factors, the analysis identified skin hygiene, hair hygiene, and nail and hand hygiene as significant contributors to the occurrence of skin disease complaints among these workers. These findings highlight the important role that personal hygiene plays in preventing skin problems in this work environment.

A. Effect of Skin Hygiene on Skin Disease Complaints

Based on the study results, after controlling for other variables, skin hygiene showed a significant effect on skin disease complaints, with a p-value of 0.005, which is less than 0.05. This finding aligns with research conducted in the Medan city area, which also reported a significant impact of skin hygiene on skin disease complaints ($p < 0.05$) [16]. Poor skin hygiene can contribute to these complaints because it creates an environment that supports the growth of pathogenic microorganisms, leading to skin infections and inflammation [17].

The results also indicate that skin hygiene is the most influential factor in skin disease complaints, with an Exp(B) value of 34.869. This means that individuals with poor skin hygiene are about 35 times more likely to experience skin disease complaints compared to those with good skin hygiene. This finding is consistent with a study conducted in India, which found that respondents with poor bathing habits were at higher risk of skin disease complaints [18]. Poor bathing practices can negatively affect skin hygiene by allowing the accumulation of dirt, oil, and dead skin cells, creating an ideal environment for pathogenic microorganisms to thrive. The study highlights that inadequate bathing can significantly increase the risk of skin infections, particularly in healthcare settings.

Maintaining skin hygiene is a crucial aspect of preventing skin diseases, as the skin serves as the body's first line of defense against pathogenic microorganisms. Practices such as regular bathing, handwashing, and changing into clean clothing help maintain the balance of the skin microbiota and support the skin's natural protective function. According to the World Health Organization (WHO), personal hygiene, including skin hygiene, plays a vital role in preventing infectious diseases, particularly in areas with poor sanitation [19]. WHO identifies inadequate body hygiene as a major risk factor for infectious skin diseases such as scabies, pyoderma, and fungal infections, especially in tropical and densely populated regions.

A four-year study conducted by Australia's Kids Research Institute in collaboration with Aboriginal health organizations succeeded in halving the prevalence of skin infections among Indigenous children in the Kimberley region of Western Australia. The study underscored the importance of regular skin checks and culturally appropriate education in the prevention and treatment of skin infections [20].

B. Effect of Hair Hygiene on Skin Disease Complaints

Based on the study findings, after controlling for other variables, hair hygiene did not show a statistically significant effect on skin disease complaints, with a p-value of 0.099, which is greater than 0.05. However, the direction of the association suggests that individuals with poor hair hygiene had a 7.9 times greater likelihood of experiencing skin disease complaints compared to those with good hair hygiene. A case-control study conducted at three urban referral centers in the United States found no significant relationship between hair washing frequency, hair oil use, or hairstyle and the incidence of *tinea capitis*. Interestingly, the study observed a possible protective effect from the use of hair conditioners, although this finding was not statistically significant [21].

Poor hair hygiene can still contribute to skin problems, particularly in the scalp area. Hair that is not cleaned regularly may lead to the accumulation of sebum, dirt, and dead skin cells, which can create a favorable environment for the growth of pathogenic microorganisms such as bacteria, fungi, and parasites. For example, *Malassezia*, a common fungus, is known to cause dandruff and seborrheic dermatitis. As in the theory, a moist and unclean scalp provides ideal conditions for the proliferation of these pathogens [22].

Research published in *Skin Appendage Disorders* highlights the importance of the hair follicle microbiome in maintaining scalp and hair health. This microbiome plays a role in regulating hair growth, managing the scalp's response to stress, and preventing colonization by harmful microorganisms [23]. Therefore, while hair hygiene was not statistically significant in this study, maintaining clean and healthy hair through regular washing with appropriate products remains important for preserving scalp integrity and preventing potential skin complaints.

C. Effect of Nail and Hand Hygiene on Skin Disease Complaints

The results of the study show that nail and hand hygiene has a significant effect on skin disease complaints after controlling for other variables, with a p-value of 0.015, which is less than 0.05. This finding is consistent with research conducted in Batar Gate, which also identified a relationship between nail and hand hygiene and skin disease complaints.

Poor hygiene in these areas can be a major source of transmission for pathogenic microorganisms that contribute to various skin disorders. The analysis produced an Exp(B) value of 11.637, indicating that individuals with poor nail and hand hygiene are over 11 times more likely to experience skin disease complaints compared to those with good hygiene.

Workers who handle seafood directly are particularly at risk, as their hands are in frequent contact with raw materials. The damp working conditions, exposure to seawater, and residual organic matter from marine animals create an ideal environment for microbial growth. Contaminants can easily accumulate under the nails, increasing the risk of irritation, contact dermatitis, and other skin infections [24]. A study in 2018 found that untrimmed or unclean nails had a bacterial contamination rate of 37.1%, significantly higher than the 24.4% observed in manicured nails [25]. These findings reinforce the importance of nail hygiene for individuals who work in wet or high-contact environments.

Furthermore, WHO has identified long or dirty nails as potential reservoirs for harmful bacteria, including *Pseudomonas aeruginosa* and *Staphylococcus aureus*, both of which are known to cause infectious and inflammatory skin diseases [26]. Maintaining proper nail and hand hygiene is therefore essential in reducing the risk of skin-related health issues. Regular hand washing, proper nail trimming, and overall cleanliness are key preventive measures. WHO and various international studies continue to emphasize hand and nail hygiene as a fundamental component of effective infection control and disease prevention strategies [27].

Conclusion

The results of the multivariate analysis indicate that, after controlling for other variables, skin hygiene and nail and hand hygiene significantly influence skin disease complaints. Although hair hygiene did not show a statistically significant effect, the data suggest that individuals with poor hair hygiene are 7.9 times more likely to experience skin disease complaints compared to those with good hygiene. Among all variables, skin hygiene emerged as the most influential factor, with an Exp(B) value of 34.869. This means that individuals with poor skin hygiene are over 34 times more likely to report skin disease complaints than those with good skin hygiene. The model accounted for 79.7% of the variation in skin disease complaints, demonstrating a strong influence of personal hygiene. These findings emphasize the importance of regular education on personal hygiene and the implementation of proper workplace sanitation procedures to reduce the risk of skin-related health issues among workers.

Limitation and Suggestions

This study relied on a closed-ended questionnaire to assess personal hygiene and skin disease complaints, making the results dependent on the respondents' honesty and comprehension. The lack of direct observation or clinical diagnosis may have led to discrepancies between reported answers and actual conditions. Future research should consider incorporating observational methods and clinical assessments to improve accuracy. It is also recommended to explore additional contributing factors, including environmental conditions and individual health status, to gain a more comprehensive understanding of the causes of skin disease complaints.

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Conflict of Interest

The authors declare no conflict of interest that could have influenced the outcomes or interpretation of this study. All phases of the research, including planning, implementation, analysis, and reporting, were conducted objectively and in accordance with scientific and ethical research standards.

References

[1] Y. K. Ashar, "Manajemen Penyakit Berbasis Lingkungan," *Cipta Media Nusantara*, 2022. [*Eng. Trans.: Environmental-Based Disease Management*]

[2] H. D. Sitanggang, N. Yutami, and E. S. Nadeak, "Kebersihan Tempat Tidur dan Sprei Sebagai Faktor Risiko Keluhan Penyakit Kulit di Wilayah Pesisir, Kampung Bugis, Kota Tanjungpinang Tahun 2018," *J. Health Technol.*, vol. 16, no. 2, pp. 56–62, 2021. [*Eng. Trans.: Bed and Linen Hygiene as a Risk Factor for Skin Disease Complaints in Coastal Areas, Kampung Bugis, Tanjungpinang City in 2018*]

[3] WHO, *World Health Statistics*, 2020. doi: 10.1088/1751-8113/44/8/085201.

[4] H. M. Anggraini, "Hubungan Penggunaan Alat Pelindung Diri Dengan Keluhan Dermatitis Pada Nelayan Ikan Di Desa Mela II, Kabupaten Tapanuli Tengah Sumatera Utara," *Repository UIN Sumatera Utara*, 2021. [*Eng. Trans.: The Relationship Between the Use of Personal Protective Equipment and Dermatitis Complaints Among Fishermen in Mela II Village, Central Tapanuli Regency, North Sumatra*]

[5] Dinas Kesehatan, "Profil Dinas Kesehatan Kota Medan," 2021. *[Eng. Trans.: Profile of Medan City Health Office]*

[6] D. L. Setyowati, Buku Digital – Keselamatan dan Kesehatan Kerja Sektor Informal, no. May. 2024. [*Eng. Trans.: Digital Book – Occupational Safety and Health in the Informal Sector*]

[7] Azizah and F. Nurcandra, "Hubungan Higiene Perorangan dan Penggunaan Alat Pelindung Diri dengan Gangguan Kulit pada Petugas Pengangkut Sampah Kota Tangerang Selatan Tahun 2018," *J. Ilm. Kesehat. Masy.*, vol. 11, no. 1, pp. 126–140, 2019. [*Eng. Trans.: The Relationship Between Personal Hygiene and PPE Use With Skin Disorders Among Waste Collectors in South Tangerang City in 2018*]

[8] Sacharin, *Principles of Paediatric Nursing*, London: Churchill Livingstone, 2009.

[9] S. Zrnčić, "Microbial Diseases of Marine Organisms," *J. Mar. Sci. Eng.*, vol. 10, no. 11, 2022, doi: 10.3390/jmse10111682.

[10] Rukmansyah S, Nurul Ulfah Mutthalib, Hidayat, Alfina Baharuddin, and Aulia Rahman, "Faktor yang Berhubungan Dengan Perilaku Penjamah Makanan Terhadap Personal Hygiene Pada Jajanan Kue Di Pasar Tradisional," *Wind. Public Health J.*, vol. 3, no. 3, pp. 458–469, 2022, doi: 10.33096/woph.v3i3.34. [*Eng. Trans.: Factors Related to Food Handler Behavior Toward Personal Hygiene in Traditional Market Snack Vendors*]

[11] F. Le, B. Liu, Z. Si, S. Li, and J. Qiao, "Prevalence of Dermatitis and Superficial Fungal Infection of the Hands in Seafood Workers: An Investigation from Food Markets in Ningbo, China," *Risk Manag. Healthc. Policy*, vol. 13, pp. 427–431, 2020, doi: 10.2147/RMHP.S240327.

[12] Z. Rasyid, W. Septiani, Y. Harnani, N. Susanti, and A. R. Bayhaqi, "Determinan Personal Hygiene dan Sanitasi Dasar dengan Penyakit Kulit (Scabies) di Pondok Pesantren Modern Al-Kautsar Pekanbaru Tahun 2022," *J. Kesehat. Lingkung. Indones.*, vol. 23, no. 2, pp. 153–161, 2024, doi: 10.14710/jkli.23.2.153-161. [*Eng. Trans.: Determinants of Personal Hygiene and Basic Sanitation with Skin Diseases (Scabies) at Modern Al-Kautsar Islamic Boarding School, Pekanbaru, in 2022*]

[13] H. Akbar, "Hubungan Personal Hygiene dan Pekerjaan dengan Kejadian Dermatitis di Wilayah Kerja Puskesmas Juntinyuat," *Promot. J. Kesehat. Masy.*, vol. 10, no. 1, pp. 1–5, 2020. [*Eng. Trans.: The Relationship Between Personal Hygiene and Occupation with Dermatitis Incidence in the Working Area of Juntinyuat Health Center*]

[14] I. Deliyana, C. Claudita, and O. Mohammad, "Hubungan Personal Hygiene dengan Keluhan Gangguan Kulit pada Petugas Pengangkut Sampah," *MIRACLE J. Health Sci. Res.*, 2024. [*Eng. Trans.: The Relationship Between Personal Hygiene and Skin Disorder Complaints Among Waste Haulers*]

[15] I. Irawati et al., "The Role of Individual Characteristics and Personal Hygiene with Dermatitis Complaints in Fishermen," *Univers. J. Public Health*, vol. 12, no. 6, pp. 1166–1173, 2024, doi: 10.13189/ujph.2024.120613.

[16] L. Adhayani et al., "The Relationship Between Personal Hygiene and Skin Complaints in Orphanage Children in the Medan Area District," *Jurnal Multidisiplin Indonesia*, vol. 2, no.12, 2023.

[17] K. AL-Smadi, V. R. Leite-Silva, N. A. Filho, P. S. Lopes, and Y. Mohammed, "Innovative Approaches for Maintaining and Enhancing Skin Health and Managing Skin Diseases Through Microbiome-Targeted Strategies," *Antibiotics*, vol. 12, no. 12, 2023, doi: 10.3390/antibiotics12121698.

[18] R. Pathak, S. Shrestha, P. Poudel, S. Marahatta, and D. K. Khadka, "Association of Socio-Demographic Factors and Personal Hygiene With Infectious Childhood Dermatoses," *Skin Health Dis.*, vol. 3, no. 3, 2023, doi: 10.1002/ski2.219.

[19] WHO, *Ending the Neglect to Attain the Sustainable Development Goals: A Strategic Framework for Integrated Control and Management of Skin-Related Neglected Tropical Diseases 2021–2030*, 2022.

[20] S. Rahmadhanti, Y. Achdiani, U. P. Indonesia, and P. K. Keluarga, "Peningkatan Kasus Kondiloma Akuminata pada Remaja Berkaitan dengan Personal Hygiene dan Pengetahuan Kesehatan Reproduksi," *J. Kendari Kesehatan Masyarakat (JKKM)*, vol. 4, no. 2, 2025. [*Eng. Trans.: Increase in Cases of Condyloma Acuminata Among Adolescents Related to Personal Hygiene and Reproductive Health Knowledge*]

[21] V. Zanichelli, C. Pavoni, J. Eastmond, and Y. Longtin, "Microbiological Efficacy and Skin Tolerance of Commonly Used Nonantiseptic Inpatient Bathing Practices in Non-ICU Settings: A Systematic Review," *Am. J. Infect. Control*, vol. 49, no. 5, pp. 603–607, 2021, doi: 10.1016/j.ajic.2020.09.011.

[22] W. Widia, L. Lamri, and D. S. Prihandono, "Identifikasi Jamur Dermatophyta Pada Helm Penumpang Ojek Online di Samarinda Seberang," *Borneo J. Sci. Math. Educ.*, vol. 4, no. 1, pp. 9–21, 2024, doi: 10.21093/bjsme.v4i1.7277. [*Eng. Trans.: Identification of Dermatophyte Fungi on Online Motorcycle Taxi Passenger Helmets in Samarinda Seberang*]

[23] J. K. Paul, M. Azmal, O. F. Talukder, A. S. N. B. Haque, M. Meem, and A. Ghosh, "Unlocking the Secrets of the Hair Microbiome: From Scalp Health to Therapeutic Advances," *Microbe (Netherlands)*, vol. 7, Oct. 2024, p. 100353, 2025, doi: 10.1016/j.microb.2025.100353.

[24] R. K. Mishra, "Fresh Water Availability and Its Global Challenge," *J. Mar. Sci. Res.*, vol. 2, no. 1, pp. 01–03, 2023, doi: 10.58489/2836-5933/004.

[25] A. Mengist, Y. Aschale, and A. Reta, "Bacterial and Parasitic Assessment from Fingernails in Debre Markos, Northwest Ethiopia," *Can. J. Infect. Dis. Med. Microbiol.*, vol. 2018, 2018, doi: 10.1155/2018/6532014.

[26] R. Amalia and A. Mutholib, "Peternak Ikan di Kelurahan Plaju Darat Kota," pp. 364–368. [*Eng. Trans.: Fish Farmers in Plaju Darat Subdistrict, City*]

[27] J. B. Glowicz et al., "SHEA/IDSA/APIC Practice Recommendation: Strategies to Prevent Healthcare-Associated Infections Through Hand Hygiene: 2022 Update," *Infect. Control Hosp. Epidemiol.*, vol. 44, no. 3, pp. 355–376, 2023, doi: 10.1017/ice.2022.304.

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Appendix: Research Questionnaire

Hygiene Items
Skin Hygiene
Do you bathe regularly (at least twice a day)?
Do you use soap when bathing?
Do you share soap with other family members?
Do you bathe after shell peeling activities each day?
Do you scrub your body while bathing?
Do you clean your whole body (including feet, back, neck) while bathing?
Clothing Hygiene
Do you change clothes at least twice a day?
Do you change clothes after bathing?
Do you share a towel with other family members?
Have you washed your towel in the past month?
Do you dry your towel after use?
Do you clean your bed before sleeping?
Have you washed your bed sheets in the past month?
Hair Hygiene
Do you wash your hair at least twice a week?
Do you always use shampoo when washing your hair?
Nail and Hand Hygiene
Do you wash your hands before eating?
Are your nails always clean and trimmed?
Do you clean and cut your nails weekly?
Do you wash your feet before sleeping?
Do you wear footwear when entering or exiting the bathroom?

Skin Disease Complaint Items
Have you experienced skin itching in the past 6 months?
Does the itching occur during the day?
Does the itching occur at night?
Is the itching spread all over the body?
Is there redness on the skin?
Are there small vesicles or blisters on the skin?
Do blisters turn into wounds when they break open?
Do the wounds feel painful?
Do the wounds feel sore?
Do the wounds feel like burning?
Do the blisters leave wrinkles or marks when they dry up?
Is your skin scaly and dry?
Is there thickening of the skin?
Is the skin cracked or chapped?
Is the skin abraded?