

The Role of Individual Characteristics and Personal Hygiene with Dermatitis Complaints in Fishermen

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Abstract Occupational diseases are conditions caused by the work environment, and fishermen, as workers in the informal sector, are particularly vulnerable to these diseases. One of the common skin diseases among fishermen is contact dermatitis, which is an inflammatory condition of the skin due to direct contact with irritants or allergens. This study aims to identify factors associated with contact dermatitis among fishermen in Pulau Buluh, Batam. The methodology used was quantitative research with an observational approach, where the sample was taken with a purposive sampling technique with a total of 40 respondents. The research instrument used a questionnaire that had been tested for validity and reliability. The results showed a significant relationship between age, education level, and personal hygiene with complaints of contact dermatitis. The data showed that fishermen older than 55 years had the highest prevalence of contact dermatitis (50%). At the same time, those with low education levels (only primary to junior high school) were also more prone to contact dermatitis (62.5%). In addition, poor personal hygiene was significantly correlated with the incidence of contact dermatitis, with 65% of respondents with poor personal hygiene reporting dermatitis complaints. In contrast, no significant association was found between tenure and the incidence of contact dermatitis. This study concludes that age, education level and personal hygiene are the main determinants of the incidence of contact dermatitis in fishermen. These findings suggest the importance of improving personal hygiene awareness and

practices among fishermen and providing ongoing education regarding the dangers of exposure to irritants and the importance of personal protection. It is recommended that fishers pay more attention to personal hygiene after fishing to prevent contact dermatitis. In addition, ongoing education programs on good hygiene practices should be improved to reduce the risk of dermatitis among fishing workers.

Keywords Characteristics, Personal Hygiene, Contact Dermatitis

1. Introduction

Skin is the largest organ in the human body and lines the muscles and internal organs [1]. It protects the body from physical trauma and is a strong bulwark against bacterial and germ attacks [2]. It also serves as a sense of touch that can detect temperature, pressure and pain [3]. One of the most common skin diseases is dermatitis, or eczema, an inflammatory skin disease [4]. Dermatitis can occur for many reasons, especially on dry skin [5]. Dermatitis is very uncomfortable and annoying [6]. Dermatitis has several types, each with different indications and symptoms [7].

Dermatitis is commonly found in adolescents and adults, often persisting for long periods of time before gradually diminishing and improving (resolving) after the age of 30

[8]. The condition is rare in middle-aged individuals and only a small percentage continue to experience it into old age [9]. Data from the Batam Health Center in 2022 showed 274 cases of dermatitis among individuals aged 19 to 70 years. According to the Basic Health Research conducted in 2021, as reported by the Indonesian Ministry of Health in 2022, the national prevalence of dermatitis cases based on respondents' complaints was 9.3% [10]. The geographical condition of Indonesia, with about 70% of its territory consisting of ocean, causes most of the coastal population to be fishermen [11]. Surveillance by the ILO in America reported that irritant contact dermatitis was the most common, accounting for 80% of cases, followed by allergic contact dermatitis at 14%-20% [25].

Contact dermatitis is an inflammatory skin condition caused by direct contact with an irritant or allergen [13]. Fishermen are often exposed to various risk factors, irritants or allergens that can trigger this condition [14]. Physical environmental factors that can cause occupational diseases in fishermen include contact with seawater, wet working conditions, hazards from microorganisms and sea creatures, and temperature and humidity [15]. These factors can lead to various occupational skin diseases. According to recent studies, the prevalence of contact dermatitis among workers in wet environments, including anglers, continues to increase due to continuous exposure to unfavourable environmental conditions [16]. Harsh working environments, often without adequate protection, exacerbate this risk, leading to chronic skin damage and various other dermatological complications [17], [18], [19]. Other studies have shown that extreme temperatures and exposure to ultraviolet light also contribute to the high incidence of contact dermatitis among fishermen [20], [21], [22]. In addition, factors such as the use of inadequate equipment and the absence of good hygiene practices also increase the risk of developing this skin disease [23], [24].

This study aims to determine the factors associated with the incidence of contact dermatitis. This is important because it can provide an understanding of the prevalence and risk factors of contact dermatitis among fishermen, a common occupation in Pulau Buluh, Batam City, Indonesia.

2. Methods

This type of research is quantitative, using observation and questionnaire methods. This study aims to determine whether there is a relationship between characteristics (age, education, working period) and personal hygiene towards contact dermatitis complaints. The scope of the study was conducted on fishermen in the coastal area of Batam city who experienced contact dermatitis complaints. The research sample used purposive sampling with a total of 40 respondents. The research instrument used a questionnaire that had been tested for validity and reliability. A total of 20 question items tested were declared valid because pearson correlation (r count) was more significant than r

table. The value of r table is 0.553 seen from 5% significance, meaning that if r count > 0.553 then the question is declared valid, and if r count < 0.553 then the question is declared invalid.

This study was conducted with ethical approval from the Universitas Ibnu Sina review board with certificate number (021/IX/LPPM/EC/2023), ensuring that all procedures conformed to ethical standards. The participants were informed of the purpose and procedures of the study, and informed consent was obtained. Confidentiality of participants' data was maintained throughout the study, and participation was voluntary with the option to withdraw at any time without any consequences.

3. Results and Discussion

3.1. Variabel Univariat

The results of univariate data from the research variables (Age, Work Period, education level, personal hygiene, and Dermatitis Complaints) can be seen in Table 1.

Table 1. Characteristics of Fishermen in Batam City

Characteristics	n	%
Age		
Young (15–24) year	3	7.5
Prime (25–54) year	14	35
Old > 55 year	23	57.5
Period of Service		
≤ 5 Years	2	5
>5 Years	38	95
Education		
elementary school-Junior high School	36	90
Senior High School	4	10
Higher Education	0	0
Personal Hygiene		
Good	5	12.5
not good	35	87.5
Dermatitis		
There's	27	67.5
None	13	32.5

The results of the age characteristics of respondents in Table 1 show that the majority of respondents are classified in old age (>55 years), namely 23 respondents (57.5%), prime age group (25-54 years), as many as 14 respondents (35%), and those classified as young age (15-24 years) as many as three respondents (7.5%). The characteristics of

respondents with tenure are known that the majority have tenure > 5 years, namely 38 respondents (95%), while tenure ≤ 5 years as many as two respondents (5%). The characteristics of respondents' education from the study's results found that the majority had an elementary school - junior high school education level as many as 36 respondents (90%), and those with >High School education are four respondents 10%. Based on the personal hygiene of respondents, it is known that the majority have poor personal hygiene, as many as 35 respondents 87.5%, and those who have good personal hygiene are five respondents

12.5%. Based on complaints of contact dermatitis in fishermen, it is known that 27 respondents (67.5%) have complaints of contact dermatitis, and 13 respondents (32.5%) do not have complaints of contact dermatitis.

3.2. Bivariate Variables

Bivariate data results of the relationship between variables of Age, Work Period, education level, and personal hygiene with Dermatitis Complaints) can be seen in Table 2, Table 3, Table 4, and Table 5.

Table 2. Relationship between Age and Contact Dermatitis among Fishermen in Batam City

Age	Contact Dermatitis Complaints		Total N	OR 95% CI	P-value
	There's	None			
	n	n			
Young (15–24) years	1 2.5%	2 5%	3 100%		
Prime (25–54) years	6 15%	8 20%	14 100%	9.52	0.009
Old > 55 years	20 50%	3 7.5%	23 100%	2.02-44.92	
Total	27 67.5%	13 32.5%	40 100%		

Table 3. Relationship between Working Period and Contact Dermatitis among Fishermen in Batam City

Period of Service	Contact Dermatitis Complaints		Total N	OR 95% CI	P-value
	There's	None			
	n	n			
≤ 5 years	0 0%	2 5%	2 5%		
>5 Years	27 67.5%	11 27.5%	38 95%	11.96 0.53-269.0	0.100
Total	27 67.5%	13 32.5%	40 100%		

Table 4. Relationship between Education and Contact Dermatitis among Fishermen in Batam City

Education	Contact Dermatitis Complaints		Total N	OR 95% CI	P-value
	There's	None			
	n	n			
Elementary-Junior High School	25 62.5%	7 17.5%	32 80%		
High School	2 5%	6 15%	8 20%	10.71 1.76-65.24	0.008
Total	27 67.5%	13 32.5%	40 100%		

Table 5. Relationship between Personal Hygiene and Contact Dermatitis among Fishermen in Batam City

Personal Higiene	Contact Dermatitis Complaints			OR 95% CI	P-value
	There's	None	Total		
	n	n	N		
Good	1 2.5%	4 10%	5 2.5%	11.56 1.14-117.44	0.031
Not Good	26 65%	9 22.5%	35 27.5%		
Total	27 67.5%	13 32.5%	40 100%		

3.2.1. Relationship between Age and Dermatitis in Fishermen

The relationship between age and contact dermatitis complaints in fishermen can be seen in Table 2.

According to the findings presented in Table 2, examining the relationship between age and contact dermatitis complaints among fishermen, it was observed that the majority of the older age group (>55 years) reported complaints, with 20 respondents (50%) experiencing issues, while three respondents (7.5%) did not. Among the prime age group (25-54 years), eight respondents (15%) had complaints, and eight respondents (20%) did not. In the young age group (15-24 years), one respondent (2.5%) had complaints, whereas two respondents (5%) did not. Statistical analysis indicated a significant relationship between age and contact dermatitis complaints among the fishermen, with a P value of 0.009. Additionally, the odds of reporting contact dermatitis complaints were found to be significantly higher in the older age group compared to the younger and prime age groups, with an Odds Ratio (OR) of 9.52. The 95% Confidence Interval (CI) ranged from 2.02 to 44.92, confirming statistical significance as the interval did not include 1. This suggests that older fishermen are approximately 9.5 times more likely to suffer from contact dermatitis than younger and middle-aged fishermen, indicating the need for targeted preventive measures, particularly for older workers in high-risk environments.

According to the ILO (2013), the working age group is divided into three categories: young age (15 to 24 years), "prime" working age (25 to 54 years), and older age (55 to 64 years or 65 years and above) [25],[26]. Age refers to the duration of an individual's life as measured from their date of birth [27]. The working age is split into two groups: dependent age and working age. The dependent age group includes individuals from 0 to 15 years and those older than 55 years, while the working age group encompasses those from 15 to 54 years [11].

3.2.2. The Relationship of Working Period with Dermatitis in Fishermen

The relationship between working period and dermatitis

in fishermen can be seen in Table 3.

Based on Table 3, the analysis reveals that fishermen with more than 5 years of service are significantly more likely to report contact dermatitis, with 67.5% (27 respondents) experiencing complaints, compared to none in the group with 5 years or less of service. The calculated Odds Ratio (OR) is 11.96, indicating that those with longer service are nearly 12 times more likely to suffer from contact dermatitis than their counterparts with shorter service. However, the wide 95% Confidence Interval (CI), ranging from 0.53 to 269.0, and the p-value of 0.100 suggest substantial uncertainty and that the association is not statistically significant. This means that while there is a noticeable trend indicating a higher risk of contact dermatitis with longer service, the current data set, particularly due to its small sample size, is insufficient to definitively establish this relationship. Further research with a larger sample size is needed to confirm these findings.

According to Miret-Pastor et al. [28], a work period of ≤ 5 years is considered new, while >5 years is classified as long-term. This finding aligns with research by Moyano et al. [29], who found no relationship between work duration and dermatitis complaints in fishermen. Work duration is an important factor in determining the length of exposure to various sources of disease that can cause skin disorders [30]. The longer a person works, the greater their exposure to environmental hazards [31]. Although theory suggests a significant relationship between work duration and dermatitis complaints, the results of this study did not show a significant relationship. This may be due to workers with longer tenure having a better understanding of the risks involved and being able to manage them more effectively [32].

Further research by Adroher-Auroux & Ben fez-Rodríguez [33] demonstrated that increased work experience enhances workers' awareness and understanding of appropriate precautions against environmental risks, leading to more consistent use of personal protective equipment (PPE). In contrast, McCollum et al. [34] found that fishermen with less work experience are generally less trained in identifying and

avoiding exposure to irritants and allergens that may cause contact dermatitis.

The study by Kabátek [35] supports these findings by showing that a comprehensive occupational health education and training program for fishers can significantly reduce the incidence of contact dermatitis, regardless of the duration of employment. The results of this study emphasize the importance of ongoing educational interventions to improve the skin health of workers in the fishing sector.

3.2.3. Relationship between Education and Dermatitis in Fishermen

The relationship between education and dermatitis in fishermen can be seen in Table 4.

Based on Table 4, there is a significant relationship between education level and contact dermatitis complaints among fishermen. In the Elementary-Junior High School group, 62.5% (25 respondents) reported complaints, while 17.5% (7 respondents) did not. In comparison, in the High School group, only 5% (2 respondents) reported complaints, with 15% (6 respondents) not experiencing issues. The Odds Ratio (OR) of 10.71 indicates that those with an elementary or junior high school education are approximately 10.7 times more likely to report contact dermatitis than those with a high school education. The 95% Confidence Interval (CI) ranges from 1.76 to 65.24, and the p-value of 0.008 confirms the statistical significance of this finding. This suggests that individuals with lower educational attainment may have a higher risk of developing contact dermatitis, potentially due to limited access to health knowledge or resources for prevention and protection.

This situation is influenced by government entities' counseling and education efforts, such as health centers and other social institutions, focusing on clean living, personal hygiene, and skin diseases [36]. Despite these efforts, the information is not effectively applied daily due to the fishermen's limited understanding [37]. Research by Irawati et al. [36] indicates that insufficient knowledge and access to information result in limited awareness of the risks associated with unhealthy behaviors, leading to a lack of motivation to adopt healthier practices. Additionally, a study on fishermen in the Takalar district found that their fishing knowledge is primarily inherited from their parents, who are also generally captured fishermen. This is further evidenced by most respondents having only completed elementary school [39].

3.2.4. Relationship between Personal Hygiene and Contact Dermatitis in Fishermen

The relationship between Personal Hygiene and contact dermatitis in Fishermen, Batam City, can be seen in Table 5.

Based on Table 5, there is a significant relationship between personal hygiene and contact dermatitis complaints among fishermen. In the Good hygiene group,

only 2.5% (1 respondent) reported complaints, while 10% (4 respondents) did not. In contrast, in the Not Good hygiene group, a much higher percentage, 65% (26 respondents), reported contact dermatitis complaints, with 22.5% (9 respondents) not experiencing complaints. The calculated Odds Ratio (OR) is 11.56, indicating that individuals with poor personal hygiene are approximately 11.6 times more likely to report contact dermatitis complaints compared to those with good personal hygiene. The 95% Confidence Interval (CI) ranges from 1.14 to 117.44, suggesting statistical significance as the CI does not include 1, though the wide range reflects some uncertainty due to the small sample size. The p-value of 0.031 further confirms the statistical significance of the association between poor hygiene and an increased likelihood of contact dermatitis. This suggests that improving personal hygiene could play an important role in reducing the risk of contact dermatitis among fishermen. This correlation is supported by Saporina et al.'s research [38], which found that fishermen with poor personal hygiene are more prone to skin diseases due to their daily activities. Similarly, the study by Dayrit et al. [39] highlights a significant relationship between personal hygiene and the incidence of contact dermatitis among fishermen.

Conversely, prolonged sun exposure can lead to skin and eye damage due to the lack of barriers reflecting sunlight [22]. Fishermen frequently experience dermatitis, specifically irritant and allergic contact dermatitis [24], [42]. This type of dermatitis is especially common on their hands and fingers because of their work environment and the materials they handle, such as fish spines and other potentially injurious objects [17].

The high prevalence of contact dermatitis on fishermen's forearms can be attributed to their practice of not wearing full-length clothing that covers their arms while working [20], [43]. Additionally, gloves are ineffective in protecting their hands from the risks associated with contact dermatitis [21]. Furthermore, a study by Aeni et al. [23] suggests that dermatitis among fishermen may result from exposure to seawater, which, due to its density, draws moisture from the skin, leading to chronic dermatitis through primary irritation. Moreover, skin conditions can also be caused by fungi or marine organisms. Wet working environments are conducive to the development of fungal infections such as moniliasis.

3.3. Limitation

This study has limitations in generalizing the results to a wider population, because the sample taken is limited to the coastal area, Batam. To address this, future research could be conducted on a larger scale, involving fishermen from various regions with diverse geographical and socio-economic backgrounds. Additionally, future studies could incorporate additional variables such as diet, stress levels, and exposure to other chemicals, which may also contribute

to the occurrence of contact dermatitis. Expanding both the sample size and the range of variables would make the findings more representative and applicable to a wider population. Moreover, future research could employ more comprehensive methodologies, such as longitudinal studies, to provide a deeper understanding of the long-term relationship between personal hygiene and the incidence of dermatitis.

3.4. Practical Implications

The findings of this study offer valuable practical implications for policymakers and health institutions. A key recommendation is to establish a community-based health education program that includes guidance on maintaining personal hygiene, particularly emphasizing the importance of washing hands with antiseptic soap after work and minimizing direct contact with irritants commonly encountered by fishermen. Additionally, providing practical training and demonstrations on proper hygiene techniques, along with the use of personal protective equipment (PPE) like gloves and moisturizers, can support fishermen in adopting healthier daily practices. Distributing PPE through government or non-governmental assistance programs or subsidies is also advised to reduce the risk of dermatitis in wet and irritant-heavy work environments. Once implemented, the program should be monitored and evaluated by tracking dermatitis complaints and conducting hygiene behavior surveys to measure its effectiveness. To ensure the program's sustainability, collaboration with health and social institutions is crucial, allowing it to be integrated with other health initiatives, such as nutrition counseling and prevention programs for diseases commonly affecting informal workers like fishermen.

Although this article emphasizes the significance of hygiene education in lowering the risk of dermatitis among fishers, there is currently no empirical evidence supporting the effectiveness of such programs. Therefore, further research is necessary to directly evaluate proposed interventions, such as hygiene training and the distribution of personal protective equipment (PPE). Conducting a randomized controlled trial could yield more definitive data on the impact of these hygiene initiatives in reducing dermatitis complaints. With this empirical evidence, the recommendations would become more robust and focused, offering policymakers a stronger foundation to design more effective prevention programs in the future.

4. Conclusions

The findings of this study indicate a significant relationship between age, education level, and personal hygiene with contact dermatitis complaints among fishermen in coastal areas, Batam City. Fishermen who are older, have lower education levels, and have poor personal

hygiene are more prone to contact dermatitis. However, no significant correlation was found between tenure and dermatitis complaints. This study highlights the critical need to raise awareness about personal hygiene practices among fishermen and to implement ongoing health education to reduce the risk of dermatitis. Going forward, targeted interventions, such as hygiene training and the provision of personal protective equipment, are needed to lower the incidence of dermatitis among workers in the informal sector. In addition, future studies with larger sample sizes and multivariate analysis are essential to strengthen these findings and provide stronger recommendations for the prevention of dermatitis among fishermen.

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