Vol. 37 / No. 2 / August 2025
Sinta 2 (Decree No: 200/M/KPT/2020)
Online ISSN : 2549-4082 ; Print ISSN : 1978-4279
Available online at https://e-journal.unair.ac.id/BIKK

Berkala Ilmu Kesehatan Kulit dan Kelamin

Original Article
Periodical of Dermatology and Venereology

Association of Personal Hygiene and Skin Disorders among Landfill Workers

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ABSTRACT

Background: Skin disorders are symptoms and signs that appear on the skin, such as redness, itching, bumps, cracked skin, and dry scaly skin caused by bacteria, viruses, fungi, parasitic infections, allergic reactions, and personal hygiene factors. Workers, including waste pickers and scavengers, often neglect their personal hygiene habits. The risk of skin disorders is also due to their activities that are always in contact with waste that accumulates in landfills. **Purpose:** This study aimed to determine the relationship between personal hygiene and skin disorders in workers at Putri Cempo landfill, Surakarta**. Methods:** An analytic observational study with a cross-sectional design using convenience sampling was conducted. The study included a total of 51 waste haulers and 22 scavengers. Personal hygiene data collection was carried out by filling out a questionnaire; kin disorder data was collected by analyzation of symptoms and direct observation of signs of skin disorders in workers. The Chi-Square test and Cramer's V test were used to assess the association. **Result:** The prevalence of skin disorders among workers at Putri Cempo landfill, Surakarta, was 46.6%. The predilections of skin disorders were on the hands, feet, and nails, with 31.5% itchy complaints and 17.8% dry and scaly skin. There was a significant relationship ($p < 0.001$) with a moderately strong correlation ($v = 0.431$) between personal hygiene and skin disorders. **Conclusion:** Personal hygiene is significantly associated and moderately correlated with skin disorders in workers at Putri Cempo landfill, Surakarta. A comprehensive approach to tackle the problems are urgently needed.

Keywords: personal hygiene, skin disorders, landfill workers, garbage.

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| Article info |
Submited: 21-12-2024, Accepted: 06-03-2025, Published: 31-07-2025

BACKGROUND

Skin disorders are conditions that appear on the outermost layer of the body resulting in symptoms and signs such as redness, itching, bumps, cracked skin, reddish patches, white edges and dry scaly skin.[1] In the National Health Profile 2019, skin and subcutaneous tissue diseases were ranked at number 6 in frequency of the 10 most frequent diseases in Indonesia. The main causes of skin symptoms and signs include direct skin contact with bacteria, viruses, fungi, parasitic infections, allergic reactions, and personal hygiene.[2] Personal hygiene behavior is often ignored by workers who are active in landfills, such as waste pickers and scavengers. This makes the population of waste pickers and scavengers very vulnerable to skin disorders[3]. Skin disorders that arise can be prevented by implementing personal hygiene habits. Due to their constant waste contact, waste pickers and scavengers are also at risk for skin disorders[4]. Waste can spread various types of diseases, including skin diseases. This is caused by bacteria, viruses, parasites, or fungi that breed among the garbage that is increasingly accumulating in the landfill[5].

One of the largest landfills in Surakarta City is Putri Cempo Landfill, a landfill managed by the Surakarta local government. During the initial survey on January 31, 2024, many waste pickers and scavengers there did not perform personal hygiene properly, such as not wearing footwear, and gloves and not keeping their hands, feet, nails, skin, and hair clean.

DOI : 10.20473/bikk.V37.2.2025.73-77

Waste pickers and scavengers must know and apply personal hygiene to prevent skin disorders. This study aimed to examine the association between personal hygiene and skin disorders among Putri Cempo landfill workers in Surakarta.

METHODS

This was an analytic observational study with a cross-sectional study approach, conducted at Putri Cempo landfill, Surakarta, in August 2024. The sampling method utilized in this study is convenience sampling, a straightforward technique where participants are selected based on their availability and suitability for the research rather than being randomly chosen.[6] Convenience sampling was employed because it was challenging to gather the landfill workers at a single time, and visiting them at their residences was also difficult, as many of them live in temporary shelters or non-permanent homes. In total, 73 landfill workers were included as respondents.

In this study, a questionnaire was utilized to collect individual characteristics such as sex (male vs female), age (grouped into below 40 years old and above 40 years old), length of work, and personal hygiene. The personal hygiene questionnaire consists of 18 questions. The questions pertain to the habit of maintaining the cleanliness of feet, hands, nails, hair, skin, bathing, and washing clothes. There are two answer options: “yes” or ‘no’. Each of “yes” answer scored as 1, and “no” answers scored as 0. Later, the personal hygiene status was categorized as poor if the total score value is $\leq$ 50% and good if the total score value is > 50%.

The incidence of skin disorders was determined through symptom history and observation of signs of skin disorders in workers. Skin disorders were categorized negative if there were no symptoms or signs and positive if at least one symptom and one sign were present.

Descriptive analyses were conducted on the distribution of sex, age, length of work, personal hygiene and skin disorders. Further, a chi square test was used to show the association of personal hygiene and skin disorders. Later, the Cramer's V test was conducted to measure the degree of the association of personal hygiene and skin disorder.

This Health Study Ethics Committee of the Faculty of Medicine UNS No 171/UN27.06.11/KEP/EC/2024 approved this study. Prior to conducting the data collection, the study was explained to respondents, who then signed an informed consent form.

RESULT

Table 1 showed the characteristics of respondents based on gender; there were 61 males (83.5%) and 12 females (16.5%). Characteristics based on age were divided into 2 categories, namely the age group < 40 years and > 40 years. In the < 40 years old age group, there were 27 people (36.9%), and in the > 40 years old group, there were 46 people (63.1%). Characteristics based on length of work are divided into 2 categories, namely < 5 years and > 5 years. In the < 5 years group there were 21 people (28.8%), and in the > 5 years group, there were 52 people (71.2%).

The average age of respondents was 48 years old while the length of service is about 14.9 years. This means that the majority of respondents had an age between about 36.2 years to 59.8 years. Meanwhile, most respondents had a length of service between 2.8 years and 27.0 years (Table 1).

Male respondents experienced more skin disorders than females. Respondents with age >40 years and length of work > 5 years experienced more skin disorders than those with age $\leq$ 40 years and length of work $\leq$ 5 years (Table 2).

The prevalence of skin disorders among workers at Putri Cempo landfill, Surakarta, was 46.6%. The predilections of skin disorders were on the hands, feet, and nails, with 31.5% itchy complaints and 17.8% dry and scaly skin (Table 3).

Table 4 showed that 46 respondents with poor personal hygiene, 29 respondents experienced skin disorders (85.3%) and 17 respondents did not experience skin disorders (43.6%). There were 27 respondents with good personal hygiene who experienced skin disorders (5 5 respondents, 14.7%) and did not experience skin disorders (22 respondents, 56.4%). The results of statistical tests using the Chi-Square Test with a degree of confidence ($\alpha < 0.05$) obtained the result of $p = 0.000$ so that the p value < 0.05. This means that there was a significant relationship between personal hygiene and skin disorders. In order to measure the correlation between the independent variable (independent), namely personal hygiene, and the dependent variable (dependent), the Cramer's V test was performed. Our study showed a fairly strong correlation between the personal hygiene and skin disorders (Cramer’s V value=0.431) (Table 4).

Table 1. Respondent characteristics

Respondent characteristics	Frequency (%)
Gender	
Male	61 (83.5)
Female	12 (16.5)
Age (years old)	
Mean±SD	48.0± 11.8
Age	
≤ 40 years old	27 (36.9)
> 40 years old	46 (63.1)
Length of work (years)	
Mean±SD	14.9 ± 12.1
Length of work	
≤ 5 years	21 (28.8)
> 5 years	52 (71.2)

Table 2. Skin disorders based on respondent characteristics

Respondent Characteristics	Skin Disorders	
	Present N (%)	Do not present N (%)
Gender		
Male	29 (85.3)	32 (82.0)
Female	5 (14.7)	7 (18.0)
Total	34 (100)	39 (100)
Age		
≤ 40 years	5 (14.7)	22 (56.4)
> 40 years	29 (85.3)	17 (43.6)
Total	34 (100)	39 (100)
Length of work		
≤ 5 years	3 (8.8)	18 (46.2)
> 5 years	31 (91.2)	21 (53.8)
Total	34 (100)	39 (100)

Table 3. Frequency and type of skin disorders among landfill workers

Skin disorders	Frequency (%)
Presence	
No	39 (53.4)
Yes	34 (46.6)
Body Area	
Itching	3 (4.1)
Hypopigmentation	2 (2.7)
Stinging	1 (1.4)
Hands, Feet, and Nails Area	
Itching	23 (31.5)
Dry/scaly	13 (17.8)
Stinging	12 (16.4)
Scalp and Hair Area	
Itching	7 (9.6)
Hypopigmentation	4 (5.5)
Redness	3 (4.1)

Table 4. Relationship between personal hygiene and skin disorders

Personal Hygiene	Skin Disorders		P value	Cramer's V value
	Present N (%)	Do not present N (%)		
Good	5 (14.7)	22 (56.4)	<0.001*	0.431
Poor	29 (85.3)	17 (43.6)		
Total	34 (100)	39 (100)		

*p-value<0.05 is considered as significant

DISCUSSION

Our study sheds lights on the prevalent skin disorders among landfill workers, along with their predilections. Furthermore, the study identified a significant relationship between personal hygiene and skin disorders, revealing a strong correlation between the two variable. These findings align with previous research, such as the study by Ardiyanti et al. (2023) on waste pickers at the Temesi landfill, Bali; their research highlighted that poor personal hygiene was a critical factor significantly linked to complaints of skin disorders. In addition, they observed that the majority of participants exhibited inadequate hygiene practices, emphasizing the pivotal role of personal hygiene in maintaining skin health.[2]

Similarly, Irjayanti et al. (2023) conducted a study on the community in the working area of Kampung Amiyu, Arso Timur District, Keerom Regency, and demonstrated a significant relationship between personal hygiene and the incidence of skin diseases. They observed that most residents in the area exhibited poor personal hygiene, largely due to a lack of awareness regarding the importance of cleanliness. Habits such as exchanging clothes among family members, not changing out of dirty clothes after activities, and wearing the same clothes multiple times without washing were identified as contributing factors to the high prevalence of skin disorders in the community.[7]

However, our study reveals that skin disorders disproportionately affect males compared to females. First, this can be attributed to the fact that majority of the respondents are male. The proportion of skin disorders was consistently higher among male respondents than female respondents. One explanation is the hormonal factor. Androgens, a hormone that mostly found in males, are very crucial in

pilosebaceous development and maintenance, regulation of hair growth, sebum secretion and production, wound healing, and skin barrier formation possessed by men. Excess androgen production can lead to various skin disorders.[8]

In our study, the individuals aged over 40 years exhibited a higher prevalence of skin disorders compared to the age group under 40 years. This finding is consistent with the Global Burden of Disease Study 2019, which highlights that skin disorders are more prevalent in older populations due to age-related changes in skin physiology.[9] Additionally, a study published in Archives of Dermatological Research emphasizes that the incidence of skin diseases increases with age, particularly in regions with high UV exposure.[10] Another study in Family Practice found that older individuals are more prone to conditions like actinic keratosis and skin cancer due to cumulative sun damage[11]. These findings can be attributed to the natural decline in collagen and elastin production, leading to reduced skin elasticity and structural integrity.[12]

The workers who belong to the >5 years group exhibited a higher prevalence of skin disorders compared to those in the <5 years group. This observation aligns with research from the CDC, which reports that prolonged exposure to workplace irritants significantly increases the risk of occupational skin diseases.[13] Similarly, a study by Chemscape Safety Technologies highlights that long-term contact with allergens and irritants leads to cumulative damage to the skin, resulting in conditions like contact dermatitis.[14] WorkSafe Queensland also notes that industries involving frequent exposure to chemicals, such as cleaning agents or solvents, show a higher prevalence of occupational skin disorders among long-term workers.[15] These findings suggest that extended exposure to workplace hazards damages the outer and inner skin layers over time, increasing the risk of skin disorders. Implementing safety protocols, such as providing personal protective equipment and regular training, is crucial to mitigate these risks.

Good personal hygiene can include actions such as changing dirty clothes into clean ones, washing clothes regularly, and drying clothes in the sun, which may reduce the risk of transmission of infection.[16] Clothes absorb a lot of sweat and dirt released by the body. This process leads to the accumulation of dirt in clothes, necessitating daily changes.[17] Germs can spread through many ways. For instance, when garbage collectors and scavengers experience itching, they may scratch their skin, which can lead to the spread of germs and the development of skin disorders.[18] Therefore, it is necessary to keep hands, feet, and nails clean. Hand hygiene is a way to prevent the spread of disease. Washing hands and feet properly can prevent the transmission of disease.[19]

Our study indicated that workers at Putri Cempo Landfill predominantly present inadequate personal hygiene regarding the cleanliness of their hands, feet, and nails. This lines up with the research conducted by Diannnita et al. (2022) about the personal hygiene of workers in the waste disposal site Ponorogo Regency, East Java, Indonesia. The study found that personal hygiene practices at waste disposal site are inadequate because of predisposition variables, including poor knowledge, attitudes, and behaviors that do not conform to the standards for hand, foot, and nail cleanliness. Furthermore, the sanitary facilities, as an additional component, are not up to the specified standards.[20]

Aini et al. (2023) observed a similar finding of fungal infection on nails among garbage transporters in Pengasinan Village. They revealed that the frequency of cutting nails was strongly associated with foot skin problems. Individuals may be more susceptible to skin disorders (onychomycosis) if they do not maintain excellent hand and foot hygiene, including cutting and cleaning nails with soap.[21]

In conclusion, we found a correlation between personal hygiene and skin disorders among landfill workers. Our study finding emphasize the urgency of action to improve the personal hygiene of workers at the Putri Cempo landfill, Surakarta. Furthermore, it is crucial to conduct routine health checks, especially fo skin conditions.

Studies related to factors associated with skin disorders, such as environmental sanitation, duration of work in a day, history of previous skin diseases, allergies, and compliance in the use of Personal Protective Equipment (PPE), need to be further investigated.

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