

Gema Lingkungan Kesehatan

Vol. 24, No. 2 (2026), pp 253-258

e-ISSN 2407-8948 p-ISSN 16933761

doi: <https://doi.org/10.36568/gelinkes.v24i2.427> Journal Homepage: <https://gelinkes.poltekkesdepkes-sby.ac.id/>

Individual Characteristics and Compliance with Personal Hygiene and PPE Use among Waste Pickers at Putri Cempo Landfill, Surakarta

Lovidia Trivijaganita¹, Yulia Sari^{2*}, Yusuf Ari Mahsuri², Sigit Setyawan²

¹ Bachelor's Program in Medicine, Faculty of Medicine, Universitas Sebelas Maret, Surakarta, Indonesia

² Department of Parasitology and Mycology, Faculty of Medicine, Universitas Sebelas Maret, Surakarta, Indonesia

*Correspondence: yuliasari_fk@staff.uns.ac.id

Waste pickers face a high risk of disease due to continuous exposure to waste; however, adherence to personal hygiene and the use of personal protective equipment (PPE) remain suboptimal. This study aimed to analyze the relationship between individual characteristics and compliance with personal hygiene and PPE use among waste pickers at the Putri Cempo Landfill, Surakarta. An analytical observational study with a cross-sectional design was conducted among 46 waste pickers, selected through purposive sampling. The dependent variables were compliance with personal hygiene and PPE use, while the independent variables included age, gender, and education level. Data were collected using a structured questionnaire and analyzed using Fisher's exact test. Most respondents demonstrated moderate compliance with personal hygiene and PPE practices. Statistical analysis indicated no significant association between gender ($p = 0.182$), age ($p = 0.564$), or education level ($p = 0.602$) and compliance behavior. Individual characteristics such as age, gender, and education were not significantly related to compliance with personal hygiene and PPE use. Therefore, interventions to improve compliance should prioritise organisational support and behavioral approaches, including education, training, and facility improvement, rather than focusing solely on demographic factors.

Keywords: Behavior, Landfill, Personal Hygiene, Personal Protective Equipment, Waste Pickers

INTRODUCTION

Waste management remains a complex issue faced by both developing and developed countries. The increasing volume and variety of waste generated from human activities demand proper management to prevent environmental and health problems (Hidayanti et al., 2024). One of the professions directly involved in the waste management process is that of waste pickers. They sort, collect, and process recyclable materials to generate income and support their daily needs (Buch et al., 2021).

Most waste pickers work and live around landfill sites, where continuous exposure to waste and poor environmental conditions can increase the risk of various health problems, including diarrhoea, skin infections, and respiratory diseases (Takahindangen et al., 2024). Therefore, implementing protective measures—particularly the use of Personal Protective Equipment (PPE) and maintaining personal hygiene—is essential to reduce these risks. PPE serves as a safeguard against physical and biological hazards and should be clean, comfortable, and safe to use (Occupational Safety and Health, 2023). However, in practice, waste pickers often

neglect PPE use due to discomfort, lack of awareness, or limited availability (Nasrul et al., 2020). In addition to PPE use, maintaining good personal hygiene—such as washing hands with soap, trimming nails, using latrines, and wearing footwear during outdoor activities—is equally important to prevent disease transmission (Yamistada, 2017). This study aimed to analyze the relationship between individual characteristics (age, gender, education) and compliance with personal hygiene and PPE use among waste pickers that can affect their compliance in maintaining personal hygiene and using Personal Protective Equipment (PPE) at the Putri Cempo Landfill, Surakarta.

METHODS

This study uses an analytical observational design with a cross-sectional approach, which was carried out at the Putri Cempo Final Disposal Site (TPA), Surakarta, in October 2024. The research population consisted of all waste pickers in the Putri Cempo Landfill area. Sampling was carried out by purposive sampling method. Sampling was based on the informal and unregistered nature of the

waste pickers population and to target participants who met the criteria with specific experience. The following are the inclusion criteria set: (1) waste pickers who have worked at the landfill for at least one year, (2) willing to participate, and (3) have signed an informed consent sheet. A total of 46 respondents met these criteria. Dependent variables are compliance with personal hygiene and the use of Personal Protective Equipment (PPE), while independent variables include age, gender, and education level.

Data were collected using a structured questionnaire filled out through direct interviews by researchers, consisting of 3 sections covering respondent characteristics, personal hygiene practices, and PPE use. Respondents' compliance was assessed using a questionnaire containing 5 questions related to PPE compliance and 7 questions related to compliance with personal hygiene. If the respondents answered 'yes' $\geq 50\%$ questions were categorized as 'adequate'. The questionnaire was adapted from (Al-Khatib et al., 2020; Assemie et al., 2021; Mardu et al., 2019) and tested the

validity and reliability of 20 waste pickers in different locations by showing a Cronbach's alpha value of 0.82.

Data analysis was performed using Fisher's exact test, as the data did not meet the assumptions required for the chi-square test. A $p < 0.05$ is considered statistically significant. This research has received ethical approval from the Research Ethics Committee of the Faculty of Medicine, Sebelas Maret University, Surakarta (Protocol ID: 200/01/08/2024; September 9, 2024). Ethical procedures include giving written consent, ensuring the validity of questionnaires, and maintaining strict confidentiality of all participant data.

RESULT AND DISCUSSION

Demographic Characteristics of Respondents

A total of 46 waste pickers participated in this study. Base on demographic characteristics study, the majority were female (58.7%), under 50 years of age (61%), and had not graduated from high school (69.6%). (See Table 1 for detailed distribution.

Table 1.

The distribution of respondents according to Demographic Characteristics at Putri Cempo Landfill, Surakarta

Characteristics	n = (Total Sample)	%
Gender		
Man	19	41.3
Women	27	58.7
Age		
< 50 years	28	61
≥ 50 years	18	39
Education Level		
Not graduate high school	32	69.6
Graduate High School	14	30.4

Source: Primary Data, 2024

Compliance with PPE and Personal Hygiene of Respondents

Among the 46 respondents, the majority demonstrated adequate compliance with both the use of

Personal Protective Equipment (PPE) (87%) and personal hygiene practices (87%). (See Table 2 for detailed distribution.)

Table 2.

The distribution of respondents according to Compliance PPE and Personal Hygiene at Putri Cempo Landfill, Surakarta

Variable	n = (Total Sample)	%
PPE Compliance		
Adequate	40	87.0
Inadequate	6	13.0

Variable	n = (Total Sample)	%
Personal Hygiene		
Adequate	40	87.0
Inadequate	6	13.0

Source: Primary Data, 2024

Bivariate Analysis

The Fisher's exact test results in Table 3 indicate that based on gender, 92.6% of female respondents (25/27) used PPE properly, compared to 78.9% of males (15/19). However, Fisher's exact test ($p=0.182$) showed no statistically significant relationship between gender and PPE compliance. Among respondents aged ≥ 50 , 88.9% had good PPE habits, versus 85.7% in the < 50 group. The difference was not significant ($p=0.564$). Meanwhile, non-

high school graduates had slightly higher PPE compliance (87.5%) than high school/vocational graduates (85.7%), but the difference was insignificant ($p=0.602$). Overall, the analysis revealed that 87% of respondents ($n=40/46$) demonstrated proper PPE utilization, with no statistically significant relationships observed with gender, age, or educational attainment.

Table 3.

The Relationship of Characteristic Respondent and Compliance of PPE on Waste Pickers at Putri Cempo Landfill, Surakarta

Variable	PPE Compliance		P-value
	Adequate (N/%)	Inadequate (N/%)	
Gender			
Man	15/78.9	4/21.1	0.182
Women	25/92.6	2/7.4	
Age			
< 50 years	16/88.9	2/11.1	0.564
≥ 50 years	24/85.7	4/14.3	
Education Level			
Not graduate high school	28/87.5	4/12.5	0.602
Graduate High School	12/85.7	2/14.3	

Source: Primary Data, 2024

The findings of this study revealed no significant association between gender, age, or education level and compliance with the use of Personal Protective Equipment (PPE) among waste pickers at the Putri Cempo Landfill. Although female respondents demonstrated slightly higher compliance (92.6%) than males (78.9%), the difference was not statistically significant ($p = 0.182$). This indicates that both male and female workers have comparable awareness and willingness to protect themselves at work. The absence of gender differences in PPE compliance is consistent with Amir et al., 2021 and (Mulyadi, 2024) who also reported that gender alone does not determine PPE use. However, variations across studies may be influenced by differences in the work environment and

supervision. In formal sectors such as hospital cleaning services, stronger managerial control and safety regulations can lead to more noticeable gender-based differences, whereas informal sectors like landfills lack structured oversight.

Contrary to expectations, this study did not find a significant relationship between individual characteristics such as age, gender, or education level and compliance with PPE use and personal hygiene among waste pickers at the Putri Cempo landfill. These findings suggest that individual demographic factors alone are not enough to explain compliance, and behavioral and organizational factors may have a more decisive role.

Regarding age, no significant association was found with PPE use compliance ($p = 0.564$). Although older workers may have more work experience, old habits and low risk perceptions can make them accustomed to working without protection. In contrast, younger workers, although more physically active, may be less aware of the risks or influenced by group norms that do not encourage consistent PPE use.

Education level also showed no significant association with PPE use compliance ($p = 0.602$). These findings are in line with the studies of Noviarini & Prananya (2023) and George et al., (2023), which stated that formal education does not necessarily predict occupational safety practices. Knowledge of PPE and the importance of its use can be gained through non-formal pathways, such as peer experience, community programs, or self-awareness. In contrast, studies in formal work environments (El-

Hadidy et al., 2022) tend to show stronger relationships due to the presence of structured training, supervision, and consistent rule-enforcement mechanisms.

The insignificance of this relationship is most likely influenced by organizational factors and the context of the informal sector, such as the limited availability of clean water and soap at the job site, the lack of comfortable PPE, and the absence of ongoing safety training or cooperatives/ waste pickers organizations that enforce the rules. Additionally, behavioral factors, such as an individual's perception of risk, work habits, and peer influence, can also affect compliance levels. This condition suggests that behavioral and work environment determinants may determine PPE use compliance more than individual characteristics alone.

Table 4.

The Relationship of Characteristic Respondent and Personal Hygiene on Waste Pickers at Putri Cempo Landfill, Surakarta

Variable	Personal Hygiene		P-value
	Adequate (N/%)	Inadequate (N/%)	
Gender			
Man	15/78.9	4/21.1	0.182
Women	25/92.6	2/7.4	
Age			
< 50 years	16/88.9	2/11.1	0.564
≥ 50 years	24/85.7	4/14.3	
Education Level			
Not graduate high school	28/87.5	4/12.5	0.602
Graduate High School	12/85.7	2/14.3	

Source: Primary Data, 2024

Contrary to expectations, this study did not find a significant relationship between gender, age, or education level and personal hygiene behavior of waste pickers at the Putri Cempo Landfill, Surakarta. Although female respondents showed slightly higher adherence than men, this difference was not statistically significant ($p = 0.182$), suggesting that both men and women had similar awareness and opportunities to maintain cleanliness, so gender was not the main determinant. These findings are in line with previous research (Garmini & Purnama, 2023), although in formal work environments, gender roles and the division of tasks can influence hygiene practices.

In the informal sector such as landfills, the risk of exposure and limited facilities are experienced by all workers, resulting in relatively similar hygiene patterns.

Age also showed no significant influence on hygiene behavior ($p = 0.564$), indicating that experience or age does not automatically determine hygiene practices. Both young and old workers may have similar habits due to limited facilities and environmental conditions. Previous studies (R & I, 2020) confirm that hygiene behaviors are more influenced by individual awareness and environmental conditions than age.

Similarly, education level was not significantly associated with hygiene behavior ($p = 0.602$). Although formal education is usually associated with health knowledge, in this context hygiene practices are more influenced by everyday experiences, peer influences, and environmental conditions, rather than formal education. These findings are in line with George et al., (2023) and

Riyska et al., (2022), who emphasize that practical experience and access to facilities have a greater role than the level of education.

The absence of this significant relationship is likely due to contextual factors, including socio-economic limitations that limit access to clean water and soap, the absence of formal training or health promotion programs, and the nature of work in landfills that normalizes less than ideal sanitation practices. These behavioral factors and environmental conditions seem to determine hygiene adherence more than individual demographic characteristics.

CONCLUSION

Although most waste pickers demonstrated adequate compliance with Personal Protective Equipment (PPE) use and personal hygiene, individual characteristics such as age, gender, and education were not significantly associated with compliance behavior. These findings suggest that compliance among waste pickers is more strongly influenced by environmental, organizational, and behavioral factors rather than demographic characteristics. Therefore, improving compliance requires strengthening institutional support, ensuring the availability and comfort of PPE, and enhancing workers' awareness through consistent health education and behavioral interventions.

SUGGESTION

Future research should explore additional determinants that may influence compliance, including behavioral motivation, work duration, access to sanitation facilities, occupational health training, and workplace culture. Expanding the scope of research to include socioeconomic status, living conditions, and environmental hygiene could provide a more comprehensive understanding of the factors affecting occupational health among informal waste workers. Interventions should focus on improving workplace infrastructure, promoting health-oriented behavior, and implementing regular training programs to foster a sustainable culture of safety and hygiene.

FUNDING

This work was supported by a grant from the APBN UNS (Grant No. 369/UN27.22/PT.01.03/2025).

REFERENCES

- Al-Khatib, I. A., Al-Sari', M. I., & Kontogianni, S. (2020). Assessment of Occupational Health and Safety among Scavengers in Gaza Strip, Palestine. *Journal of Environmental and Public Health*, 1–9. [[Crossref](#)] [[Publisher](#)]
- Amir, M., H, O. W. K., & Indriyanti, D. R. (2021). Analysis of Personal Hygiene Factors for Garbage Transporting Officers in Ternate City. *Public Health Perspectives Journal*, 6(1). [[Publisher](#)]
- Assemie, M. A., Shitu Getahun, D., Hune, Y., Petrucka, P., Abebe, A. M., Telayneh, A. T., Ambaw, M. M., Ketema, D. B., Getaneh, T., Mengist, B., Alene, M., & Habtegiorgis, S. D. (2021). Prevalence of intestinal parasitic infection and its associated factors among primary school students in Ethiopia: A systematic review and meta-analysis. *PLOS Neglected Tropical Diseases*, 15(4), 9379. [[Crossref](#)] [[Publisher](#)]
- Buch, R., Marseille, A., Williams, M., Aggarwal, R., & Sharma, A. (2021). From waste pickers to producers: An inclusive circular economy solution through development of cooperatives in waste management. *Sustainability (Switzerland)*, 13(16). [[Crossref](#)] [[Publisher](#)]
- El-Hadidy, S., El-Gilany, A., & Ismael, A. (2022). Effects of Personal Protective Equipment and Hand Washing /Sanitizers on the Skin of Healthcare Workers. *Egyptian Journal of Occupational Medicine*, 46(3), 63–76. [[Crossref](#)] [[Publisher](#)]
- Garmini, R., & Purnama, R. (2023). Hubungan Karakteristik Pekerja Terhadap Personal Hygiene Penjamah Makanan Jasa Boga Golongan B Asrama Haji Kota Palembang. *Journal Health Applied Science and Technology*, 1(2), 16–23. [[Crossref](#)] [[Publisher](#)]
- George, J., Shafqat, N., Verma, R., & Patidar, A. B. (2023). Factors Influencing Compliance With Personal Protective Equipment (PPE) Use Among Healthcare Workers. *Cureus*, 15(2). [[Crossref](#)] [[Publisher](#)]
- Gladys Evellin Takahindangen, Jilly Toar, C. B. P. (2024). DAMPAK TEMPAT PEMBUANGAN AKHIR SAMPAH TERHADAP GANGGUAN KESEHATAN DI MASYARAKAT KELURAHAN SUMOMPO KOTA MANADO TAHUN 2024. *Jurnal Ilmiah Kesehatan Manado*, 3(3), 10–11. [[Crossref](#)] [[Publisher](#)]
- Gustomo Yamistada, J. N. S. (2017). Analisis Hygiene Perorangan Terhadap Kontaminasi Telur Cacing Pada Kuku Siswa Sekolah Dasar Di Wilayah Puskesmas Tahtul Yaman Kota Jambi. *Jurnal Bahana Kesehatan Masyarakat*, 1(2), 106–113. [[Publisher](#)]
- Hidayanti, R., Zicof, E., Gusti, A., Onasis, A., & Nur, E. (2024). Analisis Risiko Paparan Gas H2S Terhadap Pemulung di TPA Air Dingin Kota Padang. *Jurnal Kesehatan Lingkungan Indonesia*, 23(1), 25–33. [[Crossref](#)] [[Publisher](#)]
- Mardu, F., Berhe, B., Tesfay, K., & Negash, H. (2019). Assessment of sanitary condition of services as implication for intestinal parasitic infections among prison inmates: institutional based cross-sectional study in eastern Tigray zonal prison. *BMC Research Notes*, 12(1). [[Crossref](#)] [[Publisher](#)]
- Mulyadi. (2024). Cleaning Service. *Jurnal Kesehatan*, 1(1), 31–41.
- Nasrul, N., Arimaswati, A., & Alifariki, L. O. (2020). Kejadian Kecacingan Pada Petugas Pengangkut Sampah Dinas Lingkungan Hidup Dan Kehutanan Kota Kendari. *Jurnal Ilmiah Kesehatan*, 12(1), 28–38. [[Crossref](#)] [[Publisher](#)]
- Occupational Safety and Health. (2023). *Personal protective equipment*. [[Publisher](#)]
- R, N. N., & I, N. (2020). Hubungan Usia Dan Tingkat Pendidikan Dengan Perilaku Personal Hygiene Di

Trivijaganita L., Sari Y., Mahsuri Y. A., Setyawan S. (2026). Individual Characteristics and Compliance with Personal Hygiene and PPE Use among Waste Pickers at Putri Cempo Landfill, Surakarta. *Gema Lingkungan Kesehatan*, 24(2), 253-258
<https://doi.org/10.36568/gelinkes.v24i2.427>

Lapas Kelas Ii B Banyuwangi. *Majalah Kesehatan Masyarakat Aceh (MaKMA)*, 3(1). [[Crossref](#)] [[Publisher](#)]

Riyska, A., Fattah, N., Wawan, S., Arfah, A. I., & Syamsu, R. F. (2022). Karakteristik Personal Hygiene Sanitasi

Lingkungan Infeksi Kecacingan Pengangkut Sampah TPA Manggala Antang. *Fakumi Medical Journal: Jurnal Mahasiswa Kedokteran*, 2(2), 93–102.
[[Crossref](#)] [[Publisher](#)]