PREVENTIF: JURNAL KESEHATAN MASYARAKAT
FAKULTAS KESEHATAN MASYARAKAT UIVERSITAS TADULAKO
http://jurnal.fkm.untad.ac.id/index.php/preventif
ISSN (P) 2088-3536 ISSN (E) 2528-3375

Management of Mask Waste and Its Problems at the Faculty of Public Health, Nusa Cendana University

Konstantinus Firminus Tapo [1] , Anderias Umbu Roga [2] , Amelya B. Sir[3]

[1, 2, 3] Public Health, Faculty of Public Health, Nusa Cendana University

Author's Email Correspondence: *anderias_umburoga@staf.undana.ac.id*
(081339407279)

ABSTRACT

Improper mask waste management during the COVID-19 pandemic poses risks of virus transmission and environmental pollution, with Indonesia producing over 1,600 tons of medical waste in a few months. This study aims to describe mask waste management practices among students of the Faculty of Public Health at Nusa Cendana University. A quantitative descriptive survey was conducted on 322 students selected through proportionate stratified random sampling. Data were collected via questionnaire and analyzed using univariate methods. Results showed that 51.9% of students practiced good mask waste management, supported by 91.9% having good knowledge and 86.3% holding positive attitudes. Students with better knowledge and attitudes were more likely to manage mask waste properly. It is recommended that the faculty provide designated mask waste bins to support proper disposal behavior.
Keywors: *Knowledge; attitude; and mask waste management*

Published by:
Tadulako University
Address:
Jl.Soekarno Hatta KM 9. Kota Palu, Sulawesi Tengah, Indonesia.
Phone: +6282197505707
Email: preventifjournal.fkm@gmail.com

Article history :
Received : 20 05 2025
Received in revised form : 16 06 2025
Accepted : 20 06 2025
Available online : 31 08 2025

PREVENTIF: JURNAL KESEHATAN MASYARAKAT
FAKULTAS KESEHATAN MASYARAKAT UIVERSITAS TADULAKO
http://jurnal.fkm.untad.ac.id/index.php/preventif
ISSN (P) 2088-3536 ISSN (E) 2528-3375

INTRODUCTION

The COVID-19 pandemic, which emerged in late 2019, brought multifaceted global challenges, particularly in health, the economy, and the environment. A key public health measure introduced to curb the virus's spread was the mandatory use of face masks in public settings. The World Health Organization (WHO) recommended this measure in April 2020 for both healthy and symptomatic individuals (1), especially because asymptomatic transmission could occur during the incubation period of up to 14 days (2).

In response, the Indonesian government incorporated mask usage into its national policy to mitigate virus transmission (3). This led to a substantial rise in the use of disposable masks. Globally, more than 129 billion masks are discarded monthly, with many ending up in marine environments(4). For example, Oceans Asia (2020) estimated that about 1.56 billion masks entered the oceans in 2020, resulting in approximately 4,689 to 6,240 metric tons of plastic waste(5). In Indonesia alone, the Indonesian Institute of Sciences (LIPI) recorded over 1,600 tons of medical waste including used masks between March and September 2020(6).

If not managed properly, used masks pose not only an environmental threat but also a public health hazard. The virus that causes COVID-19 can remain active on mask surfaces for up to 7 days on medical masks and even longer on N95 masks(11). Thus, improper disposal increases the risk of secondary virus transmission to waste handlers and the community, particularly when masks are discarded without disinfection or proper containment. Although government guidelines exist for proper disposal including disinfecting, altering the form, and discarding masks into domestic waste bins compliance among the public remains low(3).

Knowledge and attitudes are pivotal in shaping mask waste management behavior. Studies have shown that individuals with higher awareness and positive attitudes are more

likely to engage in safe disposal practices(7). However, current literature largely centers on the general public or healthcare workers, with limited focus on university students, especially those studying public health.

This presents a significant research gap. As future health professionals and community role models, public health students play a critical role in promoting proper mask waste management(8). Yet, their actual practices and the challenges they face remain underexplored particularly in Eastern Indonesia, where infrastructure and awareness may differ from urban centers.

Therefore, this study aims to describe the current practices and problems related to mask waste management among students of the Faculty of Public Health, Nusa Cendana University. This academic setting offers a unique opportunity to assess whether public health education translates into responsible environmental and health behaviors. The findings are expected to inform strategies for improving health education, increasing adherence to safe waste disposal practices, and guiding policy efforts in academic institutions during and after the pandemic.

METHODS

This study employed a descriptive research design with a quantitative approach. The research was conducted at the Faculty of Public Health, Nusa Cendana University from August to December 2022. The target population consisted of all active undergraduate students from the 2018–2022 cohorts at the Faculty of Public Health, totaling 1,658 students.

A total of 322 students were selected as respondents using a proportionate stratified random sampling technique to ensure representation across different academic years. Data were collected through structured interviews using a questionnaire. The questionnaire was self-developed by the researcher based on the mask waste management guidelines issued

by the Indonesian Ministry of Health, which were then translated into questions and statements to assess students' knowledge, attitudes, and practices (9).

RESULTS

Respondents in this study were active students of the Faculty of Public Health (FKM) at Undana from the 2018 – 2022 cohorts, totaling 322 individuals. The characteristics of the respondents in this study include gender, age, year of enrollment, study program, and type of mask used. The research results regarding respondent characteristics are presented in the following table:

Table 1. Frequency Distribution of Respondents Based on Gender, Age, Year of Enrollment, Study Program, Type of Mask Used, Mask Waste Management, and Knowledge about Mask Waste Management at FKM Undana

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	93	28.9
	Female	229	71.1
	Total	**322**	**100**
Age	< 21	146	45.3
	≥ 21	176	54.7
	Total	**322**	**100**
Year of Enrollment	2018	89	27.6
	2019	55	17.1
	2020	44	13.7
	2021	62	19.3
	2022	72	22.4
	Total	**322**	**100**
Study Program	Public Health	233	72.4
	Psychology	89	27.6

PREVENTIF: JURNAL KESEHATAN MASYARAKAT
FAKULTAS KESEHATAN MASYARAKAT UIVERSITAS TADULAKO
http://jurnal.fkm.untad.ac.id/index.php/preventif
ISSN (P) 2088-3536 ISSN (E) 2528-3375

Variable	Category	Frequency (n)	Percentage (%)
	Total	**322**	**100**
Type of Mask Used	Cloth Mask	0	0
	Disposable Medical Mask	322	100
	Other Masks	0	0
	Total	**322**	**100**
Mask Waste Management	Poor	155	48.1
	Good	167	51.9
	Total	**322**	**100**
Knowledge about Mask Waste Management	Poor	26	8.1
	Good	296	91.9
	Total	**322**	**100**

Source : Primary Data, 2023

DISCUSSION

Mask Waste Management

The study found that 167 students (51.9%) practiced good mask waste management, while 155 students (48.1%) had poor management practices. Although more than half of the respondents followed the correct procedures, nearly half still failed to comply, indicating that mask waste management remains an issue of concern particularly within educational institutions like the Faculty of Public Health at Nusa Cendana University (FKM Undana).

Proper practices include collecting used masks, disinfecting them, altering their shape, disposing of them in domestic waste bins, and washing hands afterward, as recommended by the Ministry of Health(11). However, observations revealed that many students do not separate mask waste from other types of waste, rarely disinfect masks before disposal, and often dispose of used masks without any processing. Based on field

findings, the researchers assume that the lack of supporting facilities, such as dedicated mask bins and disinfectant supplies, is a major factor in non-compliance. Most classrooms and public facilities at FKM Undana lack separate disposal bins for masks, which leads students to discard them with general waste. In addition, many respondents stated that the disposal procedure is perceived as complicated or inconvenient, discouraging proper disposal.

This is in line with previous research findings which reported that people often fail to manage mask waste due to inadequate infrastructure(10). It also supports national data indicating that, despite published guidelines, compliance at the community level remains low(3). More broadly, these findings reflect a common national challenge in translating technical guidelines into practice even among health students. As an institution that produces future health professionals, FKM Undana has both a moral and functional responsibility to serve as a model for proper mask waste management. This could be realized through the provision of appropriate facilities, integration of waste management topics into coursework, and the cultivation of an environmentally conscious campus culture.

Knowledge

A total of 91.9% of students had good knowledge of mask waste management, while 8.1% had poor knowledge. However, a paradox emerged—many students with good knowledge still did not follow proper waste management practices. Specifically, 42.3% of those with good knowledge still demonstrated poor behavior, suggesting that knowledge alone is not always translated into action. In theory, knowledge is the foundation for rational behavior when facing a public health issue. Good knowledge includes an understanding of the hazards of mask waste, disinfection methods, separation of waste, and the importance of preventing virus transmission through used masks(14). Lawrence

Green's theory supports this, stating that knowledge is a predisposing factor for behavior(13).

Based on informal interviews during data collection, researchers found that many students do not perceive mask waste as a serious threat, often because they feel personally unaffected. Another assumption observed in the field is that students believe the pandemic is over, making proper disposal procedures seem unnecessary. This perception contributes to low compliance, even among knowledgeable students. On the other hand, being public health students, the respondents' academic background allows easy access to accurate information from lectures and digital media. In addition, exposure to social media, television, and health workers further reinforces their understanding. However, the lack of internal motivation and absence of direct supervision mean that this knowledge is not automatically translated into responsible behavior.

In the broader Indonesian context, this finding suggests that high public knowledge must be supported by micro-level regulatory reinforcement, such as campus-specific rules, administrative sanctions, and regular behavior monitoring. Knowledge without a behavioral support system is unlikely to result in lasting habit changes.

CONCLUSIONS AND RECOMMENDATIONS

This study provides empirical evidence that knowledge and attitudes influence proper mask waste management practices. Students with a high level of knowledge and positive attitudes are more likely to follow recommended mask waste management procedures, such as collecting, disinfecting, damaging, disposing properly, and washing hands afterward. However, implementation barriers still exist, including limited facilities and a lack of disinfectant availability, which affect the behavior of some students.

As a recommendation, the Faculty of Public Health is encouraged to provide designated mask waste bins and disinfectant supplies on campus. In addition, continuous

education is needed to strengthen students' knowledge and attitudes so that mask waste management can be carried out consistently and correctly. Further research is recommended to examine the implementation of mask waste management programs using analytical quantitative or qualitative designs and involving a larger population to evaluate the effectiveness of knowledge- and attitude-based interventions.

BIBLIOGRAPHY

1. World Health Organization. Advice on the use of masks in the context of COVID-19: interim guidance. WHO; 2020.
2. Axmalia N, Sinanto A. The Role of Face Masks in Preventing COVID-19 Transmission. Jurnal Kesehatan Masyarakat. 2021;15(1):23–30.
3. Kementerian Kesehatan Republik Indonesia. Pedoman Pengelolaan Limbah Masker dari Masyarakat. Jakarta: Kemenkes RI; 2020.
4. Prata JC, Silva AL, Walker TR, Duarte AC, Rocha-Santos T. COVID-19 Pandemic Repercussions on the Use and Management of Plastics. Environmental Science & Technology. 2020;54(13):7760–7765.
5. Oceans Asia. COVID-19 Facemasks & Marine Plastic Pollution Report. Hong Kong; 2020.
6. Ameridya M, Nurfitriani A, Susanti Y. Waste generation due to the COVID-19 pandemic in Indonesia. Journal of Environmental Management. 2021;289:112527.
7. Fentia M, Ningsih R. Hubungan Pengetahuan dan Sikap dengan Pengelolaan Limbah Masker pada Masyarakat. Jurnal Kesehatan Lingkungan. 2020;9(2):89–96.
8. Rochanah R. Peran Mahasiswa Sebagai Agent of Change dalam Masyarakat. Jurnal Pengabdian Kepada Masyarakat. 2020;4(1):10–14.
9. Sugiyono. (2019). *Metode Penelitian Kuantitatif Kualitatif* (2nd ed.). Alfabeta.
10. Lubriyana, T., Nurjazuli, N., & Dewanti, N. A. Y. (2022). Gambaran Pengelolaan Limbah Masker Sekali Pakai oleh Rumah Tangga pada Masyarakat di Kota Semarang. *Jurnal Riset Kesehatan Masyarakat*, *2*(2), 1–8. https://eprints2.undip.ac.id/id/eprint/5053/
11. Kementerian Kesehatan RI. (2020b). Peraturan Menteri Kesehatan Republik Indonesia No. 18 Tahun 2020 tentang Pengelolaan Limbah Medis Fasilitas Pelayanan Kesehatan Berbasis Wilayah. In *Kementerian Kesehatan RI* (No. 18).

12. Irfan, M., & A, D. A. (2020). Gambaran Penggunaan Masker di Masa Pandemi Covid-19 pada Masyarakat Kelurahan Cengkeh Turi Kota Binjai Tahun 2020. *Jurnal Kesehatan Masyarakat*, *6*(1), 5–13.
13. Notoatmodjo, S. (2014). *Promosi Kesehatan dan Perilaku Kesehatan* (1st ed.). Rineka Cipta.
14. Kementerian Kesehatan RI. (2020a). Pedoman Kelola Limbah Masker Masyarakat.In*KemenkesRI*(p.1)./Pedoman_Kelola_Limbah_Masker_Masyarakat.pdf
15. Fentia, L., & Ningsih, M. F. (2020). Hubungan Pengetahuan dan Sikap dengan Pengelolaan Limbah Masker Masa Pandemi Covid - 19 di Wilayah Kerja Puskesmas Sidomulyo Rawat Inap Kota Pekanbaru. *Jurnal Kesehatan Maharatu*, *1*(2), 12–30.