

Characteristics And Mask Wearness Behavior Of Street Sweeper With Respiratory Complaints In Palembang City

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Abstract

Street sweepers are at high risk of exposure to air pollutants, making them vulnerable to respiratory problems. Therefore, preventive measures are necessary. This study used a descriptive observational survey with a cross-sectional design. The results indicated that 35 respondents (68.6%) had good knowledge about mask-wearing, 46 respondents (90.2%) had a positive attitude, and 36 respondents (70.6%) had sufficient actions regarding mask-wearing. Data analysis showed a p -value > 0.05 , indicating no significant relationship between mask-wearing behavior and respiratory complaints. The conclusion is that while the behavior of wearing masks among street sweepers is not related to respiratory complaints, the length of service and education level are related to such complaints. These findings suggest that other factors, such as the duration of employment and education, play a more crucial role in influencing respiratory health among street sweepers. Thus, efforts to improve respiratory health should also focus on these aspects in addition to promoting mask usage..

Keywords: Behavior, Masks, Street Sweepers, and Respiratory Complaints.

1. Introduction

Air is an important factor in life, but the development of physical development of cities and industrial centers, as well as the development of transportation, has resulted in changes in air quality. WHO states that urban air pollution is becoming a critical public health problem and the largest environmental risk factor for health. A person's health is strongly influenced by environmental conditions. Unhealthy environmental conditions will affect a person's level of health. The problem of poor air quality is being faced by developing countries such as Indonesia (Musfirah dan Rangkuti, 2018). According to AQLI data, 80% of Indonesia's population of >250 million is exposed to annual pollution in excess of WHO guidelines, resulting in the fifth highest loss of life expectancy in the world. Data on PM 2.5 concentrations and additional life expectancy according to WHO guidelines, Palembang City is the first of the 10 largest cities in 2016 (Greenstone dan Fan, 2019). Sulfur dioxide (SO₂) exposure puts 10 street vendors at risk in Ampera Terminal Palembang (3). The transportation sector plays a role in air pollution. Various studies show that transportation is the main source of air pollution where the transportation sector contributes 70% of the total air pollution (Inaku dan Novianus, 2020). Air pollutants occur due to the main factor of motor vehicle exhaust gases which increase rapidly every year based on data from the central statistics agency (BPS) obtained data that the increase in the number of vehicles in Indonesia increased by an average of around 7.41% per year. Motor vehicle pollutants have an impact on human health including carbon monoxide (CO) nitrogen oxides (NO_x), hydro carbon (HC), sulfur dioxide (SO₂), lead (Pb) and carbon dioxide (CO₂) (Gunawan, Hasan dan Lubis, 2020). The annual average concentration of PM 2.5 and PM 10 in 2019 in Palembang City is the 3rd highest of other cities and has a very unhealthy and dangerous category due to the forest and land fires that occurred (KemenLH, 2019). Based on data from the Central Bureau of Statistics 2020, the increase in motorized vehicles every year is a source of a lot of air pollution that occurs, in Palembang City in 2019 there were 541,729 vehicles (BPS Prov Sumsel, 2022). As the number of motorized vehicles increases, the emission of gases increases, resulting in a city with severe air pollution. Many studies have concluded that there is a close relationship between the level of urban air pollution and the

incidence (prevalence) of respiratory diseases. Motor vehicle exhaust gases can be harmful to health and the environment. This process takes place quickly and happens right away in the highway environment. (Oktavia, 2019). Respiratory tract disorders rank in the top 10 in terms of morbidity and mortality in Indonesia. People who work in a dust-exposed environment will inhale 10-100 times more dust than those outside the environment and thus have a high risk of developing abnormalities in lung and respiratory function (Fatimah dan Habibi, 2018).

One area of work that needs attention is road sweeping workers. Dust is generated from sweeping and vehicle movement, as well as through other human activities. Street sweepers are at high risk of exposure to a complex mixture of pollutants such as soil, dust, bioaerosols of biological origin such as pollen, organic matter from plants, dust generated from vehicle movement and emissions, which makes them susceptible to occupational lung diseases (Sari, 2018). The number of street sweepers in Palembang City is quite a lot, namely 1,114 people and in the implementation of work spread across 16 sub-districts divided based on the work area of the Technical Implementation Unit of the Service with working time every day (Handayani, 2017). With working hours and a working environment that has a risk of exposure to dust and vehicle emissions, these conditions can cause health impacts on workers. Generally, health problems caused by air pollution can lead to occupational diseases of the respiratory tract and visual impairment (Kurnia, Asparian dan Nurdini, 2021). Occupational health and safety of road sweepers is very important because of the risks that can occur at any time in an indefinite time. Therefore, wearing a mask is an effort to prevent the risk of causing respiratory problems. Based on the research, dust and NO₂ levels at Purabaya Terminal in Sidoarjo Regency exceed quality standards, causing respiratory complaints in terminal sweepers who experience complaints in the form of coughing and rapid breathing, while a small proportion have experienced complaints in the form of phlegm and shortness of breath (Hikmiyah, 2018). The results of the study showed a significant relationship between knowledge, attitudes, education, availability of PPE, and coworkers with the discipline of using PPE. Masks function to protect the respiratory system from harmful substances in the air that can endanger health (Yulita, Widjasena dan Jayanti, 2019). From several previous studies, no one has analyzed respiratory complaints associated with the use of masks on street sweepers. This study tries to connect the use of masks with respiratory complaints in street sweepers. The results of a preliminary survey conducted at UPTD Kecamatan Ilir Timur I through interviews and observations found that street sweepers use masks with the types of medical masks, cloth masks, and motorcycle masks, there is the use of masks that are not suitable for use, especially disposable medical masks. There were 3 street sweepers with respiratory complaints with indicators of coughing and shortness of breath. This study aims to try to provide a hypothesis that there is a relationship between mask wearing behavior and characteristics of street sweepers with respiratory complaints.

2. Research Method

The research design used was descriptive observational survey method with cross-sectional study design. The population in this study were all street sweepers at the Ilir Timur I Technical Implementation Unit as many as 103 street sweepers. Sampling in this study used simple random sampling. The number of samples was determined based on the Slovin formula (Firmansyah dan Ramadhani, 2018)

$$n = \frac{N}{[1 + N \cdot (e)^2]} \quad (1)$$

Furthermore, the data were analyzed using chi square. The independent variables of the study were mask wearing behavior, gender, age, education level, tenure, length of work and smoking habits of street sweepers. The dependent variable is respiratory complaints.

Information :

n : Sample
N : Total population size: 103
E : The tolerance limit will be error: 10%

This research has received ethical clearance from the ethics committee of the Health Ethics Committee of the Health Polytechnic, Ministry of Health, Palembang Number 0464/KEPK/Adm2/II/2022.

3. Result and Discussion

Data on the characteristics of road sweeper respondents observed are shown in table 1.

Table 1. Characteristics of street sweepers

No.	Respondent Characteristics	n	Persentase (%)
1.	Age		
	a. Teenagers (12-25 years old)	7	13,7
	b. Adults (26-45 years old)	23	45,1
	c. Elderly (46-65 years old)	20	39,2
	d. Elderly (≥ 66 years)	1	2
	Total	51	100
2.	Gender		
	a. Male	37	72,5
	b. Female	15	27,5
	Total	51	100
3.	Education Level		
	a. Low (\leq Junior High School)	35	68,6
	b. High (\geq Senior High School)	16	31,4
	Total	51	100
4.	Period of Employment		
	a. New tenure (≤ 5 years)	18	35,3
	b. Long Service Period (> 5 years)	33	64,7
	Total	51	100
5.	Length of Employment		
	a. < 8 hours	-	-
	b. ≥ 8 hours	51	100
	Total	51	100
6.	Smoking Habit		
	a. Active	26	51
	b. Passive	4	7,8
	c. No Smoking	21	41,2
	Total	51	100

Source : Data Research

Based on table 1 above, the characteristics of street sweepers based on age were found to be the youngest age of 18 years and the oldest age of 69 years. Respondents were grouped into 4 age categories according to the Indonesian Ministry of Health 2009, namely adolescents, adults, elderly, and seniors. A total of 13.7% of respondents were teenagers, 45.1% of respondents were adults, 39.2% of respondents were elderly, and 2% of respondents were seniors. Based on gender, 37 respondents (72.5%) were male and 14

respondents (27.5%) were female. Based on education level, 35 respondents (68.1%) were in low education (\leq SMP) and 16 respondents (31,4%) on higher education (\geq SMA). Based on the working period, 18 (35.3%) respondents were in the new working period and 33 respondents (64.7%) were in the old working period. Based on length of work, 51 respondents (100%) worked for \geq 8 hours/day. Based on smoking habits, 26 respondents (51%) were active smokers and 4 respondents (7.8%) were passive smokers and 21 respondents (41.2%) were non-smokers. Respondent behavior data will be displayed in table 2 below.

Table 2: Distribution of Behavioral Levels of Street Sweepers

No.	Respondent Behavior	n	Persentase (%)
1.	Knowledge		
	Good (>80%)	35	68,6
	Fair (60-80%)	16	31,4
	Poor (<60%)	-	-
	Total	51	100
2.	Attitude		
	Good (>80%)	46	90,2
	Fair (60-80%)	5	9,8
	Poor (<60%)	-	-
	Total	51	100
3.	Action		
	Good (>80%)	15	29,4
	Fair (60-80%)	36	70,6
	Poor (<60%)	-	-
	Total	51	100

Source : Data Research

Based on table 2 above, it is known that the level of street sweeper behavior is described. Based on the knowledge of respondents, 35 respondents (68.6%) with good knowledge category and 16 respondents (31.4%) with sufficient knowledge category. Based on the respondent's attitude, 46 respondents (90.2%) with a good attitude category and 5 respondents (9.8%) with a sufficient attitude category. And based on the actions of respondents as many as 15 respondents (29.4%) with good action categories and 36 respondents (70.6%) with sufficient action categories. The level of respiratory complaints of street sweepers in the frequency distribution can be seen in table 3.

Table 3. Distribution of respiratory complaint levels of street sweepers

Respiratory Complaints	n	Persentase (%)
No complaints	28	54,9
1 complaint	17	33,3
>1 complaint	6	11,8
Total	51	100

Source : Data Research

Based on table 3 above, it is known that 28 respondents (54.9%) had no respiratory complaints, 17 respondents (33.3%) with 1 complaint, and 6 respondents with >1 respiratory complaint. With a review time limit of the last 3 months from the interview with details of complaints in the form of 2 respondents (3.9%) experiencing fever, 14 respondents (27.4%) experiencing cough, 8 respondents (15.7%) experiencing flu, 3 respondents (5.9%) experiencing shortness of breath and 5 respondents (9.8%) experiencing score throat.

The results of bivariate analysis in this study stated that there was no relationship between mask wearing behavior and respiratory complaints because $p \text{ value} > 0.05$, while from several characteristics of street sweepers that had a relationship with respiratory complaints were tenure ($p \text{ value } 0.05$) and education ($p \text{ value } 0.01$).

Table 4. Relationship between working period and respiratory complaints of street sweepers

No	Length of service	Breathing complaints				Total	p-value	
		Available		Not Available				
		n	%	N	%			n
1.	New (≤ 5 years)	4	7.8	14	27.5	18	35.3	0,01
2.	Old (> 5 years)	19	37.3	14	27.5	33	64.7	
Total		23	45.1	28	54,9	51	100	

Source : Data Research

Table 5. Relationship between education and respiratory complaints of street sweepers

No	Level education	Breathing complaints				Total	p-value	
		Available		Not Available				
		n	%	N	%			n
1.	Low ($\leq MP$)	19	37,3%	16	31,4%	35	68,6%	0,05
2.	High ($\geq SMA$)	4	7,8%	12	23,5%	16	31,4%	
Total		23	45,1%	28	54,9%	51	100%	

Source : Data Research

Based on the results of the study, it shows that the behavior of wearing masks on street sweepers of the Technical Implementation Unit of the Hygiene Service of the Ilir Timur I District of Palembang City is dominated by respondents with a good knowledge category of 68.6%, attitudes with a good category of 90.2%, and actions with a sufficient category of 70.6%. These results still require improvement efforts so that the use of masks increases in anticipating the risk of exposure to air pollutants for street sweepers which can be causing respiratory complaints. This behavioral data is in line with research in Sewon Bantul District that the distribution of respondents based on the level of knowledge about the use of PPE (masks) in the workplace in the good category was 23 respondents (54.8%) (Sekarwati dan Subagiyono, 2018). One of the triggers for behavior is attitude. Attitude itself is an assessment of an object. Ideally, a person's attitude towards an object can predict individual behavior. A person's attitude towards something, we can know what people will do about it. Attitude is not yet an action or activity, but it is still a predisposition to behavior (Sujana, Hariyadi dan Purwanto, 2018). In connection with the behavior of wearing masks, the results of data analysis of respondents who did not use masks were greater in proportion not

supporting the use of masks (74.0%) compared to those who supported the use of masks 44.4%. The OR result of 3.558 means that a supportive attitude has a 3 times greater chance of not using a mask than a supportive attitude (Rustika dan Burase, 2018). The results of the study of respondents in the household industry in Blajud Hamlet, Karduluk Village, Pragaan Subdistrict who have the habit of wearing masks as many as 2 people. The act of wearing a mask has a significant relationship with impaired lung function because action is an overt behavior. The action of workers in using masks will prevent them directly from dust particles which will affect lung function disorders. (Hasanah, 2019). The results of this study are different from the results of research conducted at PT Bokormas, it is known that respondents who have negative behavior are more / dominant, namely 24 respondents (51.1%) than respondents who behave positively in using personal protective equipment masks, namely 23 respondents (48.9%) based on respiratory tract disorders, workers who behave negatively have the highest number of complaints of respiratory disorders as many as 17 respondents (36.2%) (Muhith *et al.*, 2018). The results of the study showed a significant relationship between employee behavior in using masks and respiratory disorders in employees of PT BATI Sidoharjo, Sragen Regency (Arifin, 2019). It is known that the data on the characteristics of respondents do not have a relationship between factors that affect respiratory complaints, namely age, gender, length of work and smoking habits and there is a relationship between tenure and education with respiratory complaints in sweepers of the Ilir Timur I Technical Implementation Unit.

The working period has a tendency to be one of the risk factors for respiratory complaints in industrial workers. According to Suma'mur (2009), the longer a person works, the more exposed the worker is to the hazards posed by the work environment. Continuous exposure to dust and inhalation by workers for years can result in decreased lung function. (Amalia dan Novianus, 2022). In this study, the use of masks by street sweepers did not meet the standards so that they were vulnerable to exposure to pollution, most respondents used medical masks, cloth masks, and cloth face coverings with several conditions that were not suitable for use, especially masks that were only used once so they were in poor condition. This condition will be an evaluation for stakeholders to improve PPE, especially standard masks available for use by street sweepers. Respiratory complaints in street sweepers as much as 45.1% experienced respiratory complaints with 1 (one) and more than 1 (one) complaints experienced such as shortness of breath, sore throat, cough and also fever. The use of masks to protect workers from the risk of respiratory complaints due to exposure to air with a lot of dust. Workers who are accustomed to wearing masks will be safe if the worker is in a work environment with high dust levels to protect health (Yunus, Raharjo dan Fitriangga, 2020). The use of masks that comply with health standards aims to minimize potential pollution exposure. The use of N95 face masks is recommended to minimize contact with pollutants. N95 is the type of face mask generally recommended by health researchers and the most widely used. All face masks have been certified by the National Institute for Occupational Safety and Health (NIOSH) under 42 CFR 84 regulations, and filtration efficiency was evaluated using NIOSH procedures by the Beijing Municipal Institute of Labor Protection, China. In healthy young adults, N95 face masks partially reduced airway inflammation associated with acute particle (Waldah, 2021). The use of appropriate masks in workers with polluted or dusty environments will reduce dust deposits that can enter the lungs so as to reduce the effects of existing respiratory complaints. Based on the results of the study, it was found that all sweeper respondents did not wear PPE in the form of masks while working, this would cause respondents to be more vulnerable to air pollutants which resulted in respiratory problems (Hikmiyah, 2018). N95 and N100 masks are the standard masks listed in PERMENAKER No.08/Men/VII/2010 (Nurrizqi, Wardani dan Gayatri, 2019). The use of masks can reduce the risk of dust exposure to respiratory disorders. Based on NIOSH and OSHA recommendations, masks with N95 filters can protect workers well against even very dusty conditions (Simanjuntak, 2015). This study did not in-depth analyze other factors that cause respiratory complaints/disorders which can be a variable for further research

4. Conclusion

Respondents with respiratory complaints were 17 respondents (33.3%) with 1 complaint, and 6 respondents (11.8%) had more than 1 complaint. There is no relationship between Behavior (Knowledge, Attitude, Action) of using masks with Respiratory Complaints. There is no relationship between Age, Gender, Education Level, Length of Service, and Smoking Habits with Respiratory Complaints. There is an association between Period of Work and Respiratory Complaints.

Suggestions for further research are to conduct in-depth analysis related to other factors that cause respiratory complaints / disorders of street sweepers.

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