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EFFORTS TO IMPROVE MASK USE AS A PREVENTIVE MEASURE AGAINST RESPIRATORY INFECTIONS AMONG WORKERS AT THE OPAK GADUNG FACTORY IN KEDIRI REGENCY

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ABSTRACT

Respiratory tract infections are common among informal workers who are exposed to dust, smoke, and airborne particles during production activities. This community service program aimed to improve workers' knowledge regarding the importance of using masks as a preventive measure against respiratory infections. Health education was delivered through counseling, discussion, and demonstration to 12 workers Opak Gadung factory, Desa Ringinsari, Kediri. Knowledge was assessed using pre- and post-tests. The results showed a significant increase in the average knowledge score from 52.50 to 79.90, with a p-value of 0.000, indicating that the educational intervention was effective. This activity successfully enhanced workers' awareness and proper mask-use practices. Continuous education programs are recommended to support occupational health and safety in informal workplaces.

Keywords: Health Education, Mask, Occupational Health, Respiratory Infection, Workers

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INTRODUCTION

One of the diseases with the highest incidence rates worldwide is respiratory tract infections. While respiratory tract infections are not new, they remain a concern. Globally, respiratory infections are the third most common cause of death, particularly among workers (Wiemken et

al., 2012). Respiratory tract infections are infections that occur in the respiratory tract and can lead to several respiratory disorders. Respiratory tract infections can occur suddenly or acutely. These conditions are called acute respiratory infections (ARI), such as Pneumonia, Bronchitis, Pneumonia, and Tuberculosis (TB).

Tuberculosis (TB), caused by the pathogenic bacteria Mycobacterium tuberculosis, is a significant public health problem, as it is one of the leading causes of death from infectious diseases. The number of pulmonary TB sufferers in 2013 was 297 per 100,000 population, with new cases reaching 460,000. Approximately 75% of pulmonary TB sufferers are in the economically productive age group, namely 15-50 years old (Sulistiyani and Yunita, 2015). Besides tuberculosis, other respiratory infections in Indonesia are also endemic, with an estimated 1.2 million deaths annually due to pneumonia (WHO, 2015). Pneumonia is an inflammation of the lungs caused by bacteria, with symptoms such as a high fever accompanied by a cough with phlegm, rapid breathing (>50 breaths/minute), shortness of breath, and other symptoms such as headache and decreased appetite (Riskesdas, 2013).

Respiratory tract infections such as TB and acute respiratory infections (ARI) can be caused by bacteria, viruses, fungi, or parasites. Toren et al. (2022) stated that exposure to dust and metal fumes in the workplace is strongly linked to pneumonia, which has been reported and then forgotten more than once. Dust is a particle produced by humans or in the wild, resulting from production or industrial processes (Mukono, 2005). Exposure to dust can cause discomfort or irritation, and can even cause health impacts. Small dust particles have the potential to cause lung problems (respiratory tract infections) in workers, as dust particles less than 1 μ penetrate the alveoli. Dust particles <0.1 μ move in and out of the alveoli and do not settle on the alveolar surface (Suma'mur, 2013). Research by Darmawan (2013) indicates that dust inhaled by workers can cause lung dysfunction. Dust buildup in the lungs during respiration, which then enters the alveoli, reduces oxygen levels, thus reducing lung capacity (Slamet and Kamilla, 2017).

Dust concentration in the workplace is related to host and environmental factors (Rini Pratiwi et al., 2022). Environmental factors include crowded workplaces/ homes, inadequate ventilation, room temperature and humidity, and the raw materials used in the workplace (Putri Purwandari et al., 2023). One workplace with a high risk of respiratory disorders in workers is the informal sector. The majority of workers in this sector are at higher risk of accidents and exposure to diseases,particularly respiratory infections, caused by several factors, one of which is a lack of knowledge of occupational safety and health in the workplace.

Tuberculosis (TB) in Indonesia ranks second after India, with 969,000 cases and 93,000 deaths per year, equivalent to 11 deaths per hour. According to data from the Central Statistics Agency (BPS) in 2022, 78% of TB cases were found in East Java, from various regions such as Surabaya, Jember, Sidoarjo, Malang, Gresik, Bojonegoro, and Kediri, which ranks 10th in the region with the highest TB prevalence. The

distribution of infectious diseases in Kediri Regency in 2022, as seen from data from the Central Statistics Agency of East Java Province, shows that there were 2,259 cases of Tuberculosis (TB) and 1,294 cases of Pneumonia (Central Statistics Agency of East Java Province, 2023), with the most cases occurring in people of productive age 18-50 years, the majority of whom were informal workers.

Besides tofu, Kediri City is known for its various leading industries, such as weaving, dodol (sweet sticky rice cake), herbal medicine, and gadung chips. One area known for its herbal medicine and gadung chip production is Ringinsari Village. Gadung chips (Opak Gadung) are a popular chip known for their delicious and savory taste. The Opak Gadung home industry in Ringinsari Village produces 11 to 15 quintals of Opak Gadung daily. Previous observations indicate that the production process uses various additives, such as ash, which can produce small particles that can become airborne and produce dust. Furthermore, the cooking process uses firewood, which produces dust and smoke from the combustion.

One way to mitigate respiratory problems or poisoning caused by dust from production is to use Personal Protective Equipment (PPE). Research by Ombuh et al. (2017) suggests that wearing a mask is one factor that affects lung function due to industrial dust exposure. Masks prevent dust from entering the nose directly. The importance of mask use in the workplace is largely overlooked. Environmental damage will continue to occur if control measures are not implemented. Environmental control measures include policy development, monitoring of businesses, and providing environmental education to the public. Education is an activity or effort to convey a message to individuals, groups, or communities with the goal of changing the behavior of the target group based on the message conveyed (Notoatmodjo, 2012). Providing education about the importance of mask use in the workplace to the public is done with the hope of changing public behavior and thereby supporting efforts to control environmental damage.

OBJECTIVES

General Purpose

This community service aims to provide health education on the importance of using masks to prevent respiratory diseases among workers at the Opak Gadung factory in Ringinsari Village, Kediri Regency.

Special Purpose

1. Improving workers' knowledge and skills regarding occupational safety and health in the workplace
2. Improving workers' knowledge and skills regarding diseases that can be caused by dust
3. Improving workers' knowledge and skills regarding the importance of wearing masks

PLAN OF ACTION

Strategy Plan

1. Identifying health problems in the Opak Gadung MSME in Ringinsari Village
2. Coordinating with the Village Head and business owners to implement community service activities in the form of health education at the Opak Gadung MSME in Ringinsari Village

3. Determining the target, time, and location of the community service activities
4. Implementing community service activities in the form of health education on the importance of wearing masks to prevent respiratory diseases

Implementation

1. Coordinate with the Head of Ringinsari Village, Kediri Regency, to determine the implementation of community service activities.
2. Coordinate with MSME owners to arrange the technical aspects of community service activities.
3. Prepare the equipment and materials needed for the activities.
4. Implement the community service activities.

Setting

Community Service related to Health Education on the Importance of Using Masks to Prevent Respiratory Tract Infections in Opak Gadung MSME Workers, Ringinsari Village, Kediri Regency was carried out on August 7, 2024 at the Opak Gadung MSME production house, Ringinsari Village, Kandat District, Kediri Regency.

Target

The target of this community service activity is all workers at the Opak Gadung Ringinsari factory, Kediri Regency.

RESULTS AND DISCUSSION

We conducted community service focused on health education on the importance of mask use to prevent respiratory infections in workers. To assess public knowledge about optimizing airway clearance in COPD patients, we used a 10-question questionnaire and obtained the following results.

Tabel 1. Demographic Data of Participants in Health Education on the Importance of Using Masks to Prevent Respiratory Tract Infections (n=12)

Variabel	N	%
Gender		
Male	8	33.33
Female	4	66.67
Total	**12**	**100**
Age		
45 – 50 years old	6	50
51 – 55 years old	4	33.33
56 – 60 years old	2	16.67
Total	**12**	**100**

The health educational activities the importance of using masks as a prevention of respiratory tract infections involved all opak gadung industrial workers in Ringinsari Village, Kediri Regency. Based on gender distribution, the majority of respondents were female, which was 4 people (33.33%), while male respondents were 8 people (66.67%). This shows higher participation from male teenagers in this education activity. In terms of age, Respondents consisted of three age groups. Workers were aged 45 to 60 years. In the 45-50 age group, there were 6 respondents (50%), in the 50-55 age group, there were 4 respondents (33.33%), and in the 55-60 age group, there were 2 respondents (16.67%). This age distribution shows that this educational activity reaches workers in the productive or middle age where according to Konde, et al (2020) Pulmonary tuberculosis is most often

found in the productive age, namely at the age of 15-50 years. At that age, the demographic transition occurs, which can lead to a higher life expectancy for the elderly. At the age of over 55 years the immunological system declines, making them very susceptible to various diseases.

Table 2. Average Distribution Based on Workers' Pre-Post Knowledge Test

Knowladge	Mean	N	Standard Deviation
Pre-Test	52.50	12	7.42
Post-Test	79.90	12	6.58

The analysis showed in Tabel 2. that the average pre-test score for participants was 52.5, indicating a relatively low initial level of knowledge regarding the importance of mask use. After health education, the average post-test score increased to 79.9, indicating a significant increase in knowledge.

Table 3. Normality Test of Respondents' Knowledge

Knowladge	Statistic	N	Sig.
Pre-Test	.944	12	.540
Post-Test	.958	12	.720

*Normal Distributionα>0,05 Shapiro WilkTest

Table 3 shows the results of the normality test using the Shapiro–Wilk method to determine whether the pre-test and post-test data are normally distributed. Based on the analysis, the significance value (Sig.) for the pre-test variable is 0.540 and for the post-test variable is 0.720. Both values are greater than the significance limit of $\alpha = 0.05$.

Table 4. The Influence of Health Education on Workers' Knowledge About Mask Usage (n = 12)

Knowladge	Median	Mean Difference	P value
Pre-Test	52	27.40	0.000*
Post-Test	80		

*$\alpha < 0.05$ significant with the Wilcoxon Signed-Rank Test

Table 4 shows that providing health education on the importance of mask use resulted in a significant increase in knowledge among Opak Gadung MSME workers. The median knowledge score before education was 52, while after education it increased to 80. The difference in mean knowledge showed an increase of 27.40 points, indicating a positive impact of the educational activity.

The Wilcoxon Signed-Rank test yielded a p-value of 0.000 ($\alpha < 0.05$), indicating a significant difference between knowledge scores before and after health education. Therefore, it can be concluded that the educational intervention was highly effective in increasing workers' understanding of the importance of mask use as a preventive measure for respiratory infections. The results of this study are in line with the research of Rahmania and Maryiantari (2022) which showed a significant difference in respondents' knowledge before and after health education. This is also supported by Syuhada et al. (2022) who stated that the provision of health education was effective in increasing respondents' knowledge about efforts to prevent occupational lung disease after workers participated in the counseling activities properly. This health education provided knowledge to opak gadung factory workers about the dangers

of tuberculosis and the importance of wearing masks in the workplace to avoid exposure to dust and other infectious diseases. Silica dust produced during the sandstone production process, how dust can enter the respiratory tract to the lungs, and the long-term impacts of silica dust exposure in the form of chronic obstructive pulmonary disease, silicosis, and lung cancer. The craftsmen also received education on self-protection measures and were distributed N95 masks

CONCLUSION

The Community Service activity was successfully implemented according to the plan. This activity succeeded in increasing workers' knowledge about the risks of respiratory infections that can arise from exposure to dust, combustion smoke, and small particles produced during the opak gadung production process.

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