HUBUNGAN DEBU, KEBISINGAN DAN KARAKTERISTIK INDIVIDU DENGAN KESEHATAN MASYARAKAT TERDAMPAK AKTIFITAS PT BUMI INDAH DI DESA PENFUI TIMUR KECAMATAN KUPANG TENGAH KABUPATEN KUPANG

Laurensius Talan, Anderias Umbu Roga, Yacob M. Ratu
Universitas Nusa Cendana Kupang, Indonesia
Email: christianorenold@gmail.com, fanyrambukareri@gmail.com,
ratu.jacob@staf.undana.ac.id

ARTIKEL INFO	ABSTRACT
	Industrialization helps meet human needs quickly and can harm human health if not properly monitored. The people of East Penfui Village feel the impact of PT Bumi Indah's activities in the form of dust and noise. This study aims to determine the relationship between dust and noise with the incidence of acute respiratory infection and hearing loss. This research is a quantitative research with a cross sectional approach. The study population consisted of 40 employees of PT Bumi Indah and 171 affected communities. The sample consisted of 30 employees of PT Bumi Indah and 30 other affected communities who were determined using a purposive sampling technique. Data were obtained through surveys, interviews and measurement with tools. Data were analyzed by univariate, bivariate and multivariate. The results showed that there was a relationship between dust and acute respiratory infection (p = 0.003) and OR = 5.5, meaning that the risk of acute respiratory infection illness in people exposed to dust that did not meet the requirements was 5.5 times greater than people who were not exposed to dust that did not meet the requirements. . There is a relationship between age and the incidence of acute respiratory infection (p = 0.030) and OR = 9.0, meaning that the incidence of acute respiratory infection in people aged 35 years or more is 9.0 times greater than in people under 35 years of age. There is a relationship between length of exposure to hearing loss (p=0.0001) and OR=12.0, meaning that the risk of hearing loss in people exposed for 5 years or more is 12.0 times greater than in people exposed for less than 5 years. There is a relationship between age and hearing loss (p = 0.019) and OR = 4.2, meaning that the risk of hearing loss in people aged 35 years or over is 4.2 times greater than in people under 35 years of age. The most dominant risk factor for the incidence of acute respiratory infection in communities affected by PT Bumi Indah's activities is the length of exposure with p = 0.0001 and OR = 8.32. The most dominant risk factor for hearing loss in the community affected by PT Bumi Indah's activities is the length of exposure with p = 0.0001 and OR = 21.54. It is suggested to PT Bumi Indah to provide personal protective equipment for workers, routinely watering the roads traversed by the company's vehicles, closing the trunk of the truck when loading materials, making portals at a certain distance to reduce vehicle noise.

Hubungan Debu, Kebisingan dan Karakteristik Individu dengan Kesehatan Masyarakat
Terdampak Aktifitas PT Bumi Indah di Desa Penfui Timur Kecamatan Kupang Tengah
Kabupaten Kupang

Introduction

The degree of public health is influenced by various holistic factors in which the environment is the most dominant factor (Sigalingging, 2020). From an unhealthy environment, disease will arise both from the environment itself and from other factors that use the environment as a medium of transmission. Air (oxygen) is an environmental component that has a very important role for human life. During the breathing process, pollutants can enter the body along with respiratory mechanisms such as dust, CO, CO2 and other pollutants. The pollutant can still be neutralized by the body if it is still within certain reasonable limits, but if it exceeds the threshold, the neutralization process will be disrupted (Rusdiyanto et al., 2021). Dust is a solid particle that comes from the breakdown of a material both derived from human activities and natural processes. (Rakimahwati, 2014)Dust is a solid chemical substance caused by natural or mechanical forces such as processing, crushing, softening, fast packing, blasting and others from objects, both organic and non-organic (Nakoe et al., 2014)

Noise exposure in the workplace can cause health problems including physiological, psychological, communication, balance and hearing disorders (Azas et al., 2019). The results of the 2013 Basic Health Research (Riskesdas) stated that the period prevalence of acute respiratory infection based on the diagnosis of health workers and population complaints calculated in the last 1 month was 25.0%. The results of a study on the health problem profile of workers in Indonesia in 2005 found that 40.5% of workers had complaints of respiratory problems. (Rusdiyanto et al., 2021) The number of cases of acute respiratory infection

every year in Indonesia is 150,000 cases or one person can die every 5 minutes. The prevalence of hearing loss in the group of workers exposed to noise > 85 dB was higher than in the general population. The results of a study in Taiwan on a petroleum gas company reported that the prevalence of hearing loss in field area workers was 56.8% while the prevalence of hearing loss in administration was 2.63% . A study conducted by Sundari at a steel smelting factory in Jakarta found that 31.55% of workers suffered from noise-induced deafness with a noise intensity between 85-105 dB. WHO data (2005) reported that 278 million (4.2%) of the world's population have hearing loss, 50% in Southeast Asia, including Indonesia. The Ministry of Health of the Republic of Indonesia in 1994-1996 conducted a survey in 7 provinces in Indonesia, found that the number of people with hearing loss in Indonesia was 35.6 million or 16.8% of the total population. PT Bumi Indah is a company whose line of business includes the production of asphalt (hotmix) and grinding of stone and gravel materials into ashes for road materials (land cruisers). The company started operating in East Penfui Village since 2014 by employing 66 workers including administrative employees, drivers, heavy vehicle operators, technicians, conductors, security and cooks. (Siregar, 2021) The impacts of PT Bumi Indah's activities consist of dust, noise, vehicle fumes and other impacts originating from stone crushing activities, loading and unloading of materials and vehicle traffic activities that pass through residential areas. (Mukono, 2013) his study wants to analyze the relationship of risk factors caused by PT Bumi Indah's activities to the health of the

affected community in East Penfui Village, (Affandi et al., 2022)Central Kupang District, Kupang Tahun Regency. (Achmad, 2004)

Methods

Types of research This research is a quantitative research with a cross sectional approach Research Time and Place (Wulandari et al., 2020)

This research was conducted on 1 – 31 October 2020 in East Penfui Village, Central Kupang District, Kupang Regency. Population And Sample Workers and communities affected by PT Bumi Indah's activities with a sample of 60 people

determined by the simple random sampling method. (Yuliasari, 2020).

Data Collection and Instruments Used

Data collection using a questionnaire, sound level meter, high volume sampler and tuning fork Processing and data analysis The data was processed using SPSS version 21. for windows, analyzed using statistics using simple regression test and multiple regression using the enter method at a significance level of 95%. (Nurfirda, 2020)

Results

Table 1
The Relationship Of Risk Factors With The Incidence Of Acute Respiratory Infections
In Communities Affected By PT Bumi Indah Activities
In The Village Of East Penfui In 2020

Variable	Value Of P	OR	95% CI	
Dust	0,003	5,5	1,8	16,7
Age	0,030	4,2	1,2	14,7
Length Of Exposure	0,0001	9,0	2,8	29,0

The results showed that there was a relationship between dust and acute respiratory infection (p = 0.003) and OR = 5.5, meaning that the risk of acute respiratory infection illness in people exposed to dust thatdid not meet the requirements was 5.5 times greater than people who were not exposed to dust that

did not meet the requirements. . There is a relationship between age and the incidence of acute respiratory infection (p = 0.030) andOR = 9.0, meaning that the incidence of acute respiratory infection in people aged 35 years or more is 9.0 times greater than in people under 35 years of age. (Ginting, 2008)

Table 2
The Relationship Between Risk Factors And Hearing Loss
On Communities Affected By PT Bumi Indah's Activities
In East Penfui Village 2020

No	Variable Type	Value Of P	OR	95% CI	
1	Noise Level	0,418	0,6	0,2	1,9
2	Age	0.019	4,2	1,3	13,6

3	Length Of Exposure	0.0001	12,0	2,9	48,3

There is a relationship between length of exposure to hearing loss (p=0.0001) and OR=12.0, meaning that the risk of hearing loss in people exposed for 5 years or more is 12.0 times greater than in people exposed for less than 5 years. There is a relationship between age and hearing loss (p = 0.019) and OR = 4.2, meaning that the risk of hearing loss in people aged 35 years or over is 4.2 times greater than in people under 35 years of age. (Azas et al.,2019). workers did not use masks for various reasons such as forgetting,missing masks and already damaged or dirty (Nurfirda, 2020) The results of the author's observations regarding the use of personal protective equipment (masks) found that most. The workers also said that the company rarely distributed masks to them despite their reluctance to ask the company.

Discussion

The source of dust comes from stone crushing activities, material processing into land cruisers and asphalt/hotmix using a processing machine. According to the supervisor, the material processing machine used is a machine with environmentally friendly specifications, which is capable of absorbing dust from processed materials so that dust does not fly into the air. The results of the author's observations show that when filling the material into the material processing machine, it also causes a large amount of dust and noise. (Tannady et al., 2022) The finished material is loaded onto the vehicle and then unloaded in an open area where it causes dust to fly everywhere. This condition is not addressed with the maximum use of personal protective equipment such as masks, goggles, helmets and long-sleeved work clothes to reduce or minimize the risk of contamination.(Azas et al., 2019)

The results of the author's interviews with respondents regarding the use of protective equipment show that the distribution from the company is very rarely obtained. The dusty factory location plus loading and unloading activities of materials and finished materials as well as the traffic of incoming andoutgoing company vehicles adds to the high level of dust that will be inhaled by workers. The results of the noise measurement show that 50% of respondents are exposed to noise levels above the threshold value, namely atthe location of the company PT Bumi Indah. The noise found comes from the activities of stone crushing machines and processing materials such as sand, gravel and other materials to produce asphalt or hot mix. Atthe location of PT Bumi Indah there are 2 (two) material processing machines that can operate during the day and night. (Hadi, 2005)

In addition to the noise source, another contributing factor is loading and unloading activities by the company's operational vehicles with small and large vehicle volumes to distribute materials to factory locations as well as distribution of factory processed products in the form of asphalt and aggregates to consumers in need. Noise sources that are close to workers will certainly have a greater impact on them, namely the emergence of hearing loss. (Nakoe et al., 2014) This is illustrated by the results of the auditory sensitivity measurement of workers where 60% (18 of 30 people) of them have hearing loss and only 40.% (12 of 30 people) do not. This is in line with the results of researchfrom Rindy Astike Dewanty and Sudarmaji which states that high noise levels and exposure for a long time will damage the ear nervous system which will ultimately interfere with hearing sensitivity. (Nurfirda, 2020)

The workers mostly stay at the factory site so that the longer they are exposed to thenoise sources mentioned above. The results of the observations found by the author indicate that the company does not provide personal protective equipment against noise (ear plugs or ear muffs) in addition to the reluctance of workers to ask for facilities from the

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company. Workers say work is moreimportant than personal protective equipment even though they know that there are risks involved in carrying out work in the company.(Sigalingging, 2020)

Conclusion

Based on the results of the study, it can be concluded as follows:

1. There is a relationship between dust levels and the incidence of acute respiratory infection in communities affected by PT Bumi Indah's activities in Penfui Timur Village, Kupang Tengah District, Kupang Regency with a value of p = 0.003 and OR = 5.5, meaning that the incidence of acute respiratory infection in communities exposed to dust levels does not meet the requirements.
5.5 greater risk compared to people who were not exposed.

2. There is a relationship between age and the incidence of acute respiratory infection in communities affected by PT Bumi Indah activities in Penfui Timur Village, Kupang Tengah District, Kupang Regency with a value of p = 0.030 and OR = 9.0 meaning thatthe incidence of acute respiratory infection in people aged 35 years or more is at risk 9,0 times greater than people under 35 years of age.

3. There is a relationship between length of exposure and the incidence of acute respiratory infection in communities affected by PT Bumi Indah's activities in Penfui Timur Village, Kupang Tengah District, Kupang Regency with a value of p = 0.0001 and OR =
9.0 meaning the risk of acute respiratory

infection incidence in people exposed to 5 years or more than 9.0 times greater than those exposed for less than 5 years.

4. There is no relationship between noise level and hearing loss in communities affected by PT Bumi Indah's activities in East Penfui Village, Central Kupang District, Kupang Regency with p = 0.418 and OR = 0.6.

5. There is a relationship between age and hearing loss in people affected by PT Bumi Indah's activities in Penfui Timur Village, Kupang Tengah District, Kupang Regency with a value of p = 0.019 and OR = 4.2 meaning hearing loss in people aged 35 years or more are at risk 4,2 times greater than those under 35 years of age.

6. There is a relationship between length of exposure and hearing loss in communities affected by PT Bumi Indah activities in Penfui Timur Village, Kupang Tengah District, Kupang Regency with a value of p = 0.0001 and OR = 12.0 meaning hearing loss in people who are exposed for 5 years or 12 times greater risk than those exposed for less than 5 years.

7. The most dominant risk factor for the incidence of acute respiratory infection in communities affected by PT Bumi Indah's activities is the length of exposure with OR = 8.32 and p = 0.0001.

8. The most dominant risk factor for hearing loss in the community affected by PT Bumi Indah's activities is the length of exposure with OR = 21.54, p value = 0.0001.

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