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Research Article

The Mobilization Of Metal Elements Against The Incidence Of Dermatitis Is Seen From Community Knowledge In The Mining Circle In Amonggedo Sub-District, Konawe District

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ABSTRACT

Background: Mining activities in Amonggedo sub-district have an impact on public health and environmental conditions, including data on the 10 highest diseases in the Amonggedo Health Center work area after the presence of mining activities showing 2 types of diseases due to metal distribution that have continued to increase in the last 3 years, namely Skin Disease and Underground Tissue.
Methods: The study was conducted with the Mix Method, namely descriptive analysis with water and metal quality checks carried out at the Health Laboratory of Southeast Sulawesi province and Cross Sectional research was carried out on the people of Amonggedo District, Konawe Regency.
Results: The results showed that the knowledge variable obtained the value of X2 calculated > X2 table (25.235 > 3.841) which means that there is a relationship between knowledge and the incidence of dermatitis in the Working Area of the Amonggedo Health Center, Amonggedo District, Konawe Regency.
Conclusions: Metal content in dominant soil elements exceeds the threshold value both at the inlet and outlet, namely Ni, Fe, Mg, Al, Si, Ca, Cr, Metal content in some elements exceeds the threshold value both at the inlet and outlet, namely TSS, Fe, Ni, Co, Pb, There is a moderate relationship between knowledge and the incidence of dermatitis in the Working Area of the Amonggedo Health Center, Amonggedo District, Konawe Regency.

Keywords : Nickel Mining, Heavy Metals, Dermatitis, Knowledge.

INTRODUCTION

Southeast Sulawesi Province is one of the regions in Indonesia that has abundant natural resources, especially mineral and coal mining. With these leading commodities, the mining sector has become one of the sectors in the economy in Southeast Sulawesi. This sector is quite a major contribution in supporting the economy of Southeast Sulawesi. The potential for mineral and coal mining is quite large and spread almost throughout the region, which includes Konawe Regency, South Konawe, North Konawe, Konawe Islands, Kolaka, North Kolaka, East Kolaka, Bombana, Buton, South Buton, Central Buton, Muna and Bau-Bau City.

Community development and empowerment activities have previously been regulated in Law Number 40 of 2007 concerning Limited Liability Companies, in the form of regulations regarding social responsibility in Article 74 which emphasizes that the company in carrying out its business activities in the field and / or related to natural resources must carry out social and environmental responsibilities, where these obligations are budgeted and calculated as costs The Company whose implementation is carried out with due regard and fairness. If the obligation is not carried out, sanctions will be imposed in accordance with applicable laws and regulations. Furthermore, in the explanation of the article, it is also emphasized about the purpose of enacting social responsibility obligations to continue to create harmonious, balanced, and in accordance with the environment, values, norms, and culture of the community.

Amonggodo District is a sub-district area in Konawe Regency with an area of 12,375 Ha consisting of 1 kelurahan with 14 villages with a total of 10,373 people with 938 Heads of Families [1]. The landscape of Amonggedo District consists of hills and lowlands with the morphology of the lowlands being on the southern edge of the Wawotobi plain and the Sampara plain directtly adjacetly adjacent to the morphology of the mountains [2]. With these landscapes, Amonggedo District has the potential of Natural Resources in agriculture, plantations, animal husbandry, fisheries, furniture processing industries, bricks and creasers, as well as mountain stone and nickel mining.

Mining activities in Amonggedo District have an impact on public health and environmental conditions, including data on the 10 highest diseases in the Amonggedo Health Center work area after the presence of mining activities showed 2 types of diseases due to metal distribution that continued to increase in the last 3 years, namely Skin and Tissue Diseases Under the Skin in 2020 as many as 223 cases whose numbers tend to increase in 2021 as many as 370 cases and 2022 as many as 336 cases Likewise, dental caries disease also tends to increase, namely in 2020 as many as 73 cases, increasing in 2021 to 183 cases and in 2022 as many as 123 cases in line with the increase in Mining Dig C at the location [3].

Studies on heavy metals on environmental conditions, especially groundwater, surface water and soil that have an impact on health problems in the Amonggedo District area of Konawe Regency are considered necessary,

considering the importance of preventing pollution by toxic metal elements that have an impact on health problems in the surrounding community. Some heavy metals that can have an impact on public health are TSS, Chromium, Cadmium, Iron, Copper Zinc, Nickel Cobalt and lead which affect the hue of the surrounding environment and result in health problems to the community. Several studies related to the mobility of heavy metal elements against public health problems around mining circles in Amonggedo District, Konawe Regency, Southeast Sulawesi Province.

METHODS

The study was conducted with the Mix Method, namely descriptive analysis with water and metal quality checks carried out at the Health Laboratory of Southeast Sulawesi province and Cross Sectional research was carried out on the people of Amonggedo District, Konawe Regency and the research was carried out from April - June 2023.

RESULTS

Table 1.
Distribution of Respondents by Gender in the Working Area of the Amonggedo Health Center

Gender	n	%
Man	43	45,3
Woman	52	54,7
Total	95	100

Based on the table above, out of 95 respondents, 43 respondents (45.3%) were male, and 52 respondents (54.7%) were female.

Table 2.
Distribution of respondents based on the incidence of dermatitis in the Working Area of the Amonggedo Health Center

Category	n	%
Suffer	50	52,6
No Suffering	45	47,4
Total	95	100

Based on the table above, it is known that based on respondents who suffered from dermatitis as many as 50 respondents (52.6%) and those who did not suffer as many as 45 respondents (47.4%).

Table 3. Relationship of Knowledge with the Incidence of Dermatitis in the Working Area of the Amonggedo Health Center

Knowledge	Incidence of dermatitis				n	%	X^2 Hit > X^2 Tab	Phi
	Suffer		Not Suffer					
	n	%	n	%				
Enough	8	20,5	31	79,5	39	100	25,235 > 3,841	0,537
Less	42	75,0	14	25,0	56	100		
Total	50	52,6	45	47,4	95	100		

The table above shows that there were 39 respondents who were knowledgeable, including 8 respondents (20.5%) who suffered from dermatitis and 31 respondents (79.5%) who did not suffer from dermatitis. While the respondents who were less knowledgeable as many as

56 respondents including 42 respondents (75.0%) who suffered from dermatitis and 14 respondents (25.0%) who did not suffer from dermatitis. Based on data analysis using the Chi-Square test obtained the value of X^2 calculated > X^2 table (25.235 > 3.841), then H0 was rejected and Ha was accepted, this shows that there is a relationship between knowledge and the incidence of dermatitis in the Working Area of the Amonggedo Health Center, Amonggedo District, Konawe Regency. Based on the analysis of the relationship closeness test obtained at the value of φ = 0.537, this figure shows a moderate relationship between knowledge and the incidence of dermatitis in the Working Area of the Amonggedo Health Center, Amonggedo District, Konawe Regency.

DISCUSSION

Metal Elements in the Land

Mining activities, especially nickel ore, cause physical, social, economic, and ecological impacts. Every mining company must consider serious issues towards sustainable mining [4]. In general, mining activities which include exploration activities, land exploitation, nickel smelting processes and other activities carried out by the community at the mine site will affect the physical, social and economic life of the surrounding community. Changes in environmental hue in the form of physical and chemical landscapes, soil, water and air pollution are negative impacts caused by mining activities and the Nickel Processing Industry [5].

The results of metal measurements in soil sediments show that metal levels in dominant soil elements exceed threshold values both at the inlet and main outlet Ni, Fe, Mg, Al, Si, Ca, Cr.

Metal Elements in Water

Water in the standard state is at a pressure of 1 kpa (1 bar) and a temperature of 273.15 k (0o). According to Sitanala Arsyad, water is a chemical substance with the chemical formula H2O, which is a water molecule composed of 2 hydrogen atoms covalently bonded to one oxygen atom. Water is colorless, tasteless and odorless. This chemical is an absolute solvent that has the power to dissolve many other chemicals. Like salts, acids, sugars are more than one type of gas and many organic molecules. The existence of hydrogen bonds is what causes water to have properties that are important for life.

The results of metal measurements in water show that metal levels in dominant water elements exceed the threshold values both at the inlet and outlet, namely TSS, Fe, Ni, Co, Pb.

Knowledge Relationship with Dermatitis

Knowledge is the result of knowing human senses of a particular object. The sensory process occurs through the five human senses, namely the senses of sight, hearing, smell, taste and through the skin. Knowledge or cognitive is a very important domain for the formation of one's actions (*over behavior*) [6]. Knowledge is a very important domain for the formation of one's actions. Knowledge is the result of human sensing, or the result of knowing a person about objects through the senses he has (eyes, nose, ears, and some of them). The sensing time to produce knowledge is greatly influenced by the intensity of perception of objects. Most of a person's knowledge is acquired through the sense of hearing (ears)

and the sense of sight (eyes) [6]. Dermatitis is a non-inflammatory inflammation of the skin that is acute, subacute, or chronic and influenced by many factors. According to Murlistyarini, et all (2018) in their research explained that, dermatitis is an inflammation of the skin (epidermis and dermis) in response to the influence of exogenous and endogenous factors, causing clinical abnormalities in the form of polymorphic inflorescences and itchy complaints.

Based on the results of the study showed that there were 56 respondents who were less knowledgeable. Based on respondents' answers to the questionnaire, there were respondents who were less knowledgeable because respondents did not know about the characteristics of dermatitis, how to prevent dermatitis, types of dermatitis, wearing personal protective equipment and hygiene protective clothing. In addition, based on the results of questions and answers with several respondents, it was found that the low knowledge of respondents related to dermatitis was because respondents did not get information related to dermatitis both from health services and the media. Respondents considered dermatitis to be just a normal problem for a person and would be cured by taking drugs sold at stalls. Factors that affect a person's knowledge include education and age [6]. The results showed that the highest level of education respondents were high school graduates as many as 49 respondents. The level of education will also affect people's knowledge. Education is a place to develop personality and abilities inside and outside of school and lasts a lifetime [6]. The results of this study are in line with research conducted by Syahputri (2018), where the low knowledge of elementary school students about clean and healthy living behavior in Harjosari 1 Village, Medan Amplas sub-district before counseling was given. The same research was conducted by Rafsanjani (2017) with the title "The Effect of Health Education on Knowledge of Clean and Healthy Living Behavior at the Al-Hikmah Semberejo Islamic Boarding School Karangmojo Gunung Kidul" with a value of $p < 0.05$, so that there is an influence on the level of knowledge after being given health education.

Bivariate analysis showed that 20.5% of respondents were moderately knowledgeable yet had dermatitis. This is because there are respondents who do not maintain individual hygiene so that they can suffer from dermatitis. While respondents who are less knowledgeable, there are 25.0% of respondents who do not suffer from dermatitis. This is because respondents have the habit of taking a shower every morning, changing clothes 2x a day, and changing bed sheets. Based on the analysis, it shows that there is a relationship between knowledge and the incidence of dermatitis in the Working Area of the Amonggedo Health Center, Amonggedo District, Konawe Regency. Based on the analysis of the closeness test obtained at the value of $\varphi = 0.537$, this figure shows a moderate relationship between knowledge and the incidence of dermatitis in the Working Area of the Amonggedo Health Center, Amonggedo District, Konawe Regency. This is because the majority of people lack knowledge about their personal hygiene that must be applied daily such as farmers who do not immediately take a shower after work, rarely change and wash their work clothes. In line with Refiani's research, D (2021) it was obtained that there is a relationship between knowledge and the incidence of dermatitis at

the Sidomulyo Inpatient Health Center in Pekanbaru City (p = 0.004 and closeness = 0.386). In line with the relationship between this study and the study, it shows that knowledge about dermatitis is important to prevent the occurrence of dermatitis. Based on Notoatmodjo's theory in (Anggraitya Dhera, 2017) knowledge contains six levels of elements, namely knowing, understanding, application, analysis, synthesis, and evaluation. According to Liswanti (2015), one of the predisposing factors that affect health status such as contact dermatitis is the level of education and knowledge so that workers who have good knowledge must be able to apply it in daily activities so that workers who do not know can become aware.

CONCLUSIONS

Based on the results of the study, it can be concluded that the metal content in the dominant soil element exceeds the threshold value both at the inlet and outlet, namely Ni, Fe, Mg, Al, Si, Ca, Cr; Metal content in water elements of several elements exceeds the threshold value both at the inlet and outlet, namely TSS, Fe, Ni, Co, Pb; there is a moderate relationship between knowledge and the incidence of dermatitis in the Working Area of the Amonggedo Health Center, Amonggedo District, Konawe Regency.

There should be cross-sectoral cooperation between village officials and health workers for socialization to all groups so that they can carry out nickel mining activities wisely and wisely.

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