

ORIGINAL ARTICLE

Correlation of Peat Water and Skin Disease Complaints in the Community of Handil Sohor Village, Indonesia

Hubungan Penggunaan Air Gambut dengan Keluhan Kulit yang Terjadi pada Masyarakat Desa Handil Sohor, Indonesia


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ABSTRACT

Background

The use of peat water as a water source, especially in areas with large peatlands, such as in central Kalimantan, is still common. Handil Sohor is one of the villages in Central Kalimantan Province where the community still uses peat water for daily needs. Peat water, which does not fulfill the health requirement, is used for daily needs such as bathing and washing; therefore it can cause health complaints on the skin. Purpose of this study was to determine the correlation between peat water and skin disease complaints that happened in society.

Methods

The research type used is an analytical descriptive method with a cross-sectional design. The samples used in this research are 116 people taken with the purposive sampling technique and peat water samples. This research is conducted in June - October 2022.

Results

This research results showed that in a society with a contact duration of more than 60 minutes/day experienced skin disease complaints are 32 respondents in a society with a frequency of using peat water more than three times/day who experienced skin disease complaints are 41 respondents. The statistical test results through the chi-square test obtained the results for the contact duration variable with scores (p-value = 0,007) and (OR = 2,857).

Conclusions

Contact duration and frequency of use of peat water correlate with skin disease complaints.

Keywords: Peat water; Peatlands; Central Kalimantan; Skin disease complaints.

ABSTRAK

Latar Belakang

Pemanfaatan air gambut sebagai sumber air terutama di daerah dengan lahan gambut yang luas seperti di Kalimantan Tengah masih banyak terjadi. Handil Sohor merupakan salah satu desa di Provinsi Kalimantan Tengah yang masyarakatnya masih menggunakan air gambut untuk kebutuhan sehari-hari. Air gambut yang tidak memenuhi syarat kesehatan digunakan untuk kebutuhan sehari-hari seperti : mandi dan mencuci sehingga dapat menimbulkan keluhan kesehatan pada kulit. Tujuan apa penelitian ini adalah mengetahui hubungan air gambut dengan keluhan penyakit kulit yang terjadi di masyarakat.

Metode

Jenis penelitian yang digunakan adalah metode deskriptif analitis dengan rancangan cross sectional. Sampel yang digunakan dalam penelitian ini sebanyak 116 orang yang diambil dengan teknik purposive sampling dan sampel air gambut. Penelitian ini dilakukan pada bulan Juni – Oktober 2022.

Hasil

Hasil penelitian ini menunjukkan bahwa pada masyarakat dengan durasi kontak lebih dari 60 menit/hari yang mengalami keluhan penyakit kulit sebanyak 32 responden. Pada masyarakat dengan frekuensi penggunaan air gambut lebih dari 3 kali/hari yang mengalami keluhan penyakit kulit sebanyak 41 responden. Hasil uji statistik melalui uji chi-square diperoleh hasil untuk variabel durasi kontak dengan skor ($p\text{-value} = 0,007$) dan ($OR = 2,857$).

Kesimpulan

Lama kontak dan frekuensi penggunaan air gambut berkorelasi dengan keluhan penyakit kulit.

Kata Kunci: Air gambut; Lahan gambut; Kalimantan Tengah; Keluhan penyakit kulit.

INTRODUCTION

Water is one of the basic needs of human life. Every day, humans need water to fulfill the needs of drinking, cooking, bathing, washing clothes, etc.^{1,2} The water used must be clean water that meets the requirements in terms of quality or quantity.³ The existing water quality must meet the health degree from the physical, chemical, and biological parameters. The quality of clean water must be water that has no taste and does not have an odor, water that is not cloudy, or has a low turbidity level. The water also does not contain *E. Coli* bacteria; water contains low chemical components such as manganese iron and pH (6,5 - 8,5).⁴

Indonesia is one of the countries rich in water resources but still has problems with the availability of clean water.⁵ The purpose of sustainable development goal 6 is to ensure the availability and sustainable management of clean water and sanitation for all. Indonesia still has no representative national data about water quality, which can be used to calculate the SDGs indicator regarding using safe drinking water services.⁶ The measuring instrument currently used is a proxy measuring instrument determined at the national level to determine the baseline for SDGs 6, developed by the Central Bureau of Statistics using data from the national economy social survey.⁷ Based on the data, in Indonesia in 2017, only 70.04% of the population had access to proper drinking water. Thus, 29.96%, or almost 80 million Indonesians, still have no access to drinking water.

Indonesia has extensive peatlands⁸, with an area of up to 22.5 million hectares (ha) spread across various parts of Indonesia.⁹ The provinces with the largest peatlands in Indonesia such as Papua, Central Kalimantan, Riau, West Kalimantan, and South Sumatera Province.¹⁰ The existence of abundant peatlands makes peat water the most common surface water so people living on peatlands use peat water as the main water source to meet their water needs.¹¹ The peat water has characteristics of low pH (3-4), has a sour taste, has high organic content, high iron (Fe) and manganese (Mg) content, and has a color of reddish-brown to black.¹² Based on the standard of clean water quality set out in the Minister of Health Regulation of Indonesia Number 32 of 2017, peat water is classified as water that is not suitable for use in meeting daily needs.⁴ Water that is not suitable for use can affect health because it can become a source of disease transmission for humans; therefore water quality must be considered.¹³

The areas with clean water shortages are more vulnerable to being infected with infectious skin diseases.¹⁴ Skin is the largest organ in the body, covers the body's entire external surface and is a part of the body that is very sensitive to environmental conditions.¹⁵ Peat is an extreme environment with a low pH of water, which affects the skin's health. Types of skin diseases caused by using peat water include contact dermatitis, and common skin problems including dry skin, rough texture, scaly on the hands, feet, or face, acne, tinea versicolor, rash, or skin inflammation.

Handil Sohor Village is one of the villages in the Mentaya Hilir Selatan District, East Kotawaringin Regency, Central Kalimantan, Indonesia with extensive peatlands; this causes the water in the area to be peat water. Handil Sohor village is crossed by an artificial river, which becomes the main water source for the society. The previous survey shows that the community still uses peat water to fulfill its daily needs because of the unavailability of clean water in the village. Because people in Handil Sohor village still use peat water, researchers are interested in seeing whether there is a correlation between the use of peat water and the occurrence of skin diseases in Handil Sohor village.

METHODS

The research method used in the research is analytical descriptive with cross-sectional design. This research is conducted in Handil Sohor Village Mentaya Hilir Selatan District in June – October 2022; all people are located around the river and use the peat water for daily needs with a total of 773 people. In this research, the samples used are community samples and peat water samples. In this study, the samples used were community samples and peat water samples. The community sample was taken by purposive sampling technique, using a questionnaire which was taken according to the inclusion and exclusion criteria with a total sample of 116 people. The peat water samples are taken from 3 point locations in the village river. The independent variable in this study was the use of peat water, including duration of use, and frequency of use. At the same time the dependent variable in this study is the incidence of skin disease.

Bivariate analysis was carried out on two variables that were thought to be related. This study aims to determine the correlation between peat water and skin disease complaints in the Handil Sohor Village, Mentaya Hilir Selatan District community. The statistical test used is the Chi-Square statistical test, and the Odds Ratio (OR) using SPSS computing.

RESULTS AND DISCUSSION

Based on the results of the laboratory examination of Water Media for Sanitary Hygiene Purposes, it has been found that in terms of the physical quality of peat water on turbidity parameters obtained at all three points does not meet the requirements where the standard quality value of turbidity that meets the requirements is 25 Nephelometric Turbidity Unit (NTU).

Table 1. Water quality measurement results

Parameters	Unit	Quality Standard	Analysis Results		
			Sampling Point 1	Sampling Point 2	Sampling Point 3
Turbidity	NTU	25	121*	102*	95*
pH	-	6.5-8.5	4.26*	5.90*	4.48
Fe	Mg/L	1	24.95*	5.84*	8.11*
Manganese	Mh/L	0.5	0.6*	0.51*	0.7*

Note: * = does not meet the requirements

The results of laboratory tests for the parameters of iron (Fe), manganese (Mn), and pH obtained at the three sampling points of river water did not meet the requirements (Table 1). One hundred sixteen respondents participated in filling out the questionnaire; most of them were female, as many as 69 respondents (59.5%). Most respondents in the age group of 20-60 years had 92 respondents (79.3%). The education of the respondents is generally elementary school with, as many as 47 respondents (40.5%). The occupations of most of the respondents are farmers, as many as 43 respondents (37.1%). All respondents do not have a history of allergies that can cause skin disease complaints, and in general, respondents have lived >15 years as many as 96 respondents (82.8%).

Table 2. Characteristics of water used by community.

Water characteristics	n=116	
	n	%
Colored		
Yes	114	98.3
No	2	1.7
Smell		
Yes	47	40.5
No	69	59.5
Taste		
Yes	63	54.3
No	53	45.7
Cloudy		
Yes	89	76.7
No	27	23.3

Characteristics of peat water used by respondents are colored as many as 114 respondents (98.3%), smelled as many as 47 respondents (40.5%), tasted as many as 63 respondents (54.3%), and cloudy as many as 89 respondents (76.7%) (Table 2).

All of the respondents use peat river water for bathing, washing, and toileting. There are 52.6% of respondents who do not do sedimentation or processing beforehand, and the remaining 47.4% of respondents who do sedimentation of peat water. In addition, 51.7% of respondents made contact with peat water for more than 60 minutes, and the remaining 48.3% of respondents had contact with peat water for less than 60 minutes. The frequency of using peat water is more than or equal to 3 times a day as many as 56.9% of respondents and the remaining 43.1% of respondents use peat water with a frequency of less than three times a day. As many as 48 respondents (41.4%) of respondents got skin disease due to the use of peat river water.

Table 3. Correlation of contact time to skin disease complaints in the community in Handil Sohor village, Mentaya Hilir Selatan district

		Skin disease complaints		Total	P-value	OR	95% CI
		No	Yes				
Contact Time	<60 minutes/day	40	16	56	0.007	2.857	1.322-6.173
	>60 minutes/day	28	32	60			
Total		68	48	116			

People with contact duration of less than 60 minutes did not experience skin disease complaints, with as many as 40 respondents, and people who experienced skin disease complaints as many as 16 respondents. For people with more than 60 minutes of contact, 28 respondents did not experience skin disease complaints, and 32 respondents experienced skin disease complaints (see table 3). Complaints or diseases of the skin experienced are: itching, redness, feeling hot on the skin, and scaly skin.

The statistical test results through the chi-square test obtained a probability score of 0,007 or less than 0,05. It means that there is a correlation between contact duration with water and the occurrence of skin disease complaints. The score of the Odds ratio (OR) obtained is 2.857 (95% CI 1.322-6.173), which means that respondents who come into contact with peat river water for more than 60 minutes have the chance to experience skin disease complaints 2.857 times higher compared to respondents with the length of time each time it is in contact with peat river water is less than or equal to 60 minutes.

Contact duration is when the respondent was in contact with the allergen and irritant in hours/day. Each respondent has a different contact duration according to the daily activities process. The longer they are in contact with allergens and irritants, inflammation or skin irritation can occur, causing skin disorders.^{16, 17}

Community habits influence exposure, therefore, the contact duration between human and environmental components has a high potential to the dangers of disease because each person has different contact duration based on the activities. Repeated exposure to irritants will lead to tolerance, resulting in increased inflammatory reactions and dry skin. The more often workers are exposed to irritants, the greater the risk of suffering from irritant contact dermatitis. Contract duration can affect the incidence of irritant contact dermatitis. Repeated exposure to irritants will cause tolerance, resulting in an increased inflammatory reaction.¹⁸

Table 4. Correlation of frequency of use to skin disease complaints in the community in Handil Sohor village, Mentaya Hilir Selatan district

		Skin disease complaints		Total	P-value	OR	95% CI
		No	Yes				
Frequency of Use	<3 times/day	43	7	50	0.000	10.074	3.931-25.816
	>3 times/day	25	41	66			
Total		68	48	116			

People with the frequency of using peat water less than three times/day did not experience skin disease complaints as many as 43 respondents, and people who experienced skin disease complaints as many as seven respondents. Respondents with a frequency of use, more than three times/day who did not experience skin disease complaints as many as 25 respondents and people who experienced skin disease complaints as many as 41 respondents (table 4).

The statistical test results through the chi-square test obtained a probability score of 0,000 or less than 0.05. This means there is a correlation between the frequency of water use and the occurrence of skin disease complaints. The score of Odds ratio (OR) obtained is 10.074 (95% CI 3.931-25.816), which means that respondents with the frequency of use of peat water more than three times a day have the chance to experience skin disease complaints 10.074 times higher compared to respondents with the frequency of use of peat water less than three times a day.

The more often the respondent is exposed to river water whose quality does not meet the requirements, the greater the chance for the respondent to experience skin disorders such as itching.¹⁹ This is because the body is often in repeated contact with irritants in water which causes skin disorders and will facilitate cell damage in the skin layer.²⁰

CONCLUSION

Based on the research results and discussion that has been done, the conclusions obtained are as follows: (1) The physical and chemical quality of peat water in Handil Sohor Village river in terms of turbidity, Fe, Mn, and pH parameters in all sample points do not meet the health requirements; (2) Respondents who used peat river water for bathing and washing activities are 100%, performed water treatment before use by 47.7%, contact duration ≥ 60 minutes/day 51.7%, and contact frequency \geq times/day 56.9%; (3) The health complaints experienced by the residents due to the use of peat water are skin disease complaints such as itchy skin 40.5%, redness 25.0%, hot 5.3%, and scaly 15.5%; (4) The contact duration with peat water is correlated with skin disease complaints in the user of peat water in Handil Sohor Village River Mentaya Hilir Selatan District with a p-value score of 0,007 and OR 2.857. The frequency of peat water usage is correlated with skin disease complaints in Handil Sohor Village River Mentaya Hilir Selatan District with a p-value score of 0.000 and OR 10.074.

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AUTHORS CONTRIBUTION

Study conception and design: N, IWW; data collection: IWW; analysis and interpretation of results: N, IWW, FDA, SH; draft manuscript preparation: N, IWW.

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CONFLICT OF INTEREST

"Competing interests: No relevant disclosures".

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