

## Original Research Article

# ASSOCIATION BETWEEN DURATION AS A FISHERMAN, DISTANCE OF HEALTH FACILITIES AND SMOKING WITH PTERYGIUM'S DISEASE IN FISHERMAN IN BENGKULU

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### Abstract

**Background:** Fishermen are a high risk group for developing pterygium. The high frequency of exposure to UV, wind, dust and sand when working makes the prevalence of pterygium among fishermen quite high. The city of Bengkulu, which is geographically located on the west coast of Sumatra Island which is directly facing the Indonesian Ocean, makes the majority of its population work as fishermen.

**Objectives:** This study aims to determine the relationship between duration of being a fisherman, distance to health facilities and smoking with pterygium disease in a group of fishermen in, Bengkulu.

**Methods:** Analytical observational research with case control design. The sample of 120 fishermen consisted of 40 cases and 80 controls, because researchers used a case-control ratio of 1:2. Sampling using purposive sampling method. The dependent variable was pterygium disease. Independent variables of duration as a fisherman, distance of health facilities and smoking. The research instrument uses a structured questionnaire that has been tested for validity and reliability with Alpha Cronbach value (0.996) >  $r_{table}$ . Data were analyzed by Chi Square.

**Results:** Based on the research results, it was found that there was a significant relationship with duration as a fisherman ( $\geq 21$  years) (OR = 3.980; 95%CI = 1.404-11.284;  $p = 0.006$ ) with pterygium disease. There is no relationship between smoking (OR = 1.246; 95%CI = 0.559-2.778;  $p = 0.590$ ) with pterygium disease. There is a significant relationship between the distance of health facilities (OR = 5.133; 95%CI = 2.249-11.715;  $p = 0.000$ ) with pterygium disease.

**Conclusion:** The length of time working as a fisherman increases the risk of developing pterygium disease as the frequency of exposure to UV, dust, wind and sand increases. It is necessary to use personal protective equipment to reduce the risk of exposure and education from health workers so that the public can take good preventive measures.

**Keywords:** *Duration as a fisherman, distance health facilities, smoking, pterygium.*

## INTRODUCTION

Every 5 seconds found 1 person in the world suffering from blindness, it is estimated by the World Health Organization (WHO) there are more than 7 million people who become blind every year. It is currently estimated that 180 million people around the world have visual impairments, of which there are between 40-45 million suffer from blindness and 1 of them is in South East Asia. The population that continues to increase and the factor of age, this number is expected to increase 2 times by 2020. This affects the quality of life and socio-economic status and makes the nation's economy located at a low level. The presentation of blindness affects the economic contribution of the population in the 50-65 year age group and work results due to the social economy of the family (Perdami, 2019).

One of the eye diseases, namely pterygium, is a thickening of the conjunctiva or the white part of the eye on the medial and / or lateral sides, and is progressively expanding towards the cornea. Usually occurs in the elderly, but can also be found in young adults. Geographically, pterygium is mostly found in tropical and dry countries, one of which is Indonesia (Risksedas, 2013). Pterygium has the potential to cause decreased visual acuity, chronic irritation, recurrent inflammation, double vision, impaired eyeball movement and even cause blindness (Marcella, 2019).

Some data from the ministry of health in 8 districts where the Fish Collection Center (PPI) is located shows that health problems and problems for fishermen, such as eye disorders, continue to increase (Ministry of Health, 2014). The prevalence rate of Pterygium in Bengkulu exceeds the national prevalence rate, which is more than 8.3%. This figure continues to increase due to the lack of public attention to eye health. Pterygium is a common external eye disease with a prevalence ranging between 0.7% and 33% globally. Pterygium itself is found mostly in groups of farmers/ fishermen/ laborers with a prevalence of 15.8% compared to other groups of workers (Risksedas, 2013).

Fishermen are a high-risk group for suffering from Pterygium disease, both one and two eyes. Fishermen have the most frequent exposure to ultraviolet rays and dry, windy, dusty and sandy working conditions (Rany, 2017). Fishermen work in an unsanitary and unsafe environment. Moreover, most fishermen have low education, knowledge of occupational safety and health is still minimal (Rany, 2017).

The use of Personal Protective Equipment (PPE) when fishermen are working has not been optimally used. Employee workers in urban areas use three times more PPE than fishermen, farmers and labor groups (Ardianty, 2018). This study aimed to determine the relationship between duration of being a fisherman, distance to health facilities and smoking with pterygium disease in fishermen in Bengkulu.

## METHODS

### *Study Design*

This type of research is an epidemiological study that is analytic observational with a case-control design. Case control studies were conducted by examining the risk factors that influence the occurrence of cases in a retrospective manner. Measurements are made on the independent variable and the dependent variable simultaneously.

This research was conducted in the midst of the Covid-19 pandemic. Researchers implemented health protocols by applying the use of masks, maintaining distance and carrying hand sanitizers. When collecting data, the researcher sends a confirmation message to the respondent in advance, to make an appointment to conduct an interview. Researchers met respondents one by one so as not to cause a crowd.

### *Setting*

This research was conducted in Malabero Village, Bengkulu City from August to September 2020.

### Research Subject

The population in this study were fishermen who live in the Malabero village of Bengkulu City in 2020.

The number of samples is determined based on the calculation of the minimum sample size formula as follows (Lemeshow, 1997):

$$n = \frac{\{Z_{1-\alpha/2}\sqrt{2P_2(1-P_2)} + Z_{1-\beta}\sqrt{P_1(1-P_1) + P_2(1-P_2)}\}^2}{(P_1-P_2)^2}$$

Explanation:

$$Z_{1-\alpha} = 1,96$$

$$Z_{1-\beta} = 0,842$$

$P_1$  = Anticipated probability of exposure for persons with disease 65%

$P_2$  = Anticipated probability of exposure for persons without disease 35%

OR (Odds Ratio) = 7.75

n (sample) = 40 people

The minimum sample size for this study is 40 people. Comparison of the number of cases and controls using a ratio of 1: 2. So that the minimum sample size of this study is 40 cases and 80 controls, a total of 120. Sampling in this study was carried out using purposive sampling method. Inclusion criteria for research subjects as follows:

- The case group was fishermen who suffered from pterygium and were recorded in the hospital medical record in Bengkulu City in 2019, filled out an informed consent, and could be interviewed properly.
- The control group is fishermen who do not suffer from pterygium, have the same way of diagnosis as pterygium disease, have the same exposure to risk factors as the case group, and fill out an informed consent.

And also, exclusion criteria for research subject as follows:

- Respondents could not be found, respondents were not fishermen, respondents refused to be interviewed

and respondents did not live permanently in Malabero Bengkulu.

### Instruments

The research instrument used was a structured questionnaire. The questionnaire was tested first on 30 respondents before being used to determine its validity and reliability. The validity test uses the Pearson formula, if in the test it turns out that there are invalid questions then re-analysis is carried out by issuing invalid questions. The questionnaire was declared valid with a value of  $r_{\text{count}} > r_{\text{table}}$ , namely  $0.998 > 0.361$ . After all valid questions are followed by a reliability test using Alpha Cronbach (Noor, 2011). This questionnaire is declared reliable, with an alpha value of 0.996.

### Data Analysis

Data were analyzed using SPSS version 21 software. Univariate analysis was performed to describe each variable (duration of being a fisherman, smoking, distance to health facilities and pterygium disease. Bivariate analysis was carried out to see the relationship and amount of risk between the dependent variable and the independent variable using the Chi Square statistical test.

### Ethical Consideration

This research was conducted after obtaining approval from the Health Research Ethics Committee of Dr. M. Yunus Bengkulu. Ethical Clearance with No. 24/KEPK.RSMY/VIII/2020.

**RESULTS**

*Characteristics of Respondents*

The characteristics of the respondents in this study can be seen in table 1.

**Table 1.** Frequency Distribution of Respondents by Age, Educational Level, Age at Being a Fisherman and Duration as a Fisherman on August to September 2020.

<b>Characteristics of Respondents</b>	<b>Number (n)</b>	<b>Percentage (%)</b>
<b>Age (Years)</b>		
16-25	2	1.7
36-35	35	29.2
36-45	53	44.1
46-55	24	20.0
56-65	6	5.0
<b>Educational Level</b>		
Elementary School	18	15.0
Junior High School	43	35.8
Senior High School	59	49.2
<b>Age Being Fisherman (Years)</b>		
11-15	23	19.2
16-20	69	57.5
21-25	28	23.3
<b>Duration as a Fisherman</b>		
< 21 Years Old	34	28.3
≥ 21 Years Old	86	71.7
<b>Smoking</b>		
Light Smoker	43	35.8
Heavy Smoker	77	64.2
<b>Distance of Health Facilities</b>		
< 1 km	67	55.8
≥ 1 km	53	44.2

Sources: Primary Data of Questionnaire, 2020.

Based on the results of the study, it was found that most of the respondents' ages were in the 36-45 years age category (44.2%). For the education level of the respondents, most of them have senior high school education (49.2%). For the age when they were fishermen, most of the respondents were 16-20 years old when they first became fishermen (57.5%). Furthermore, most of the respondents ≥ 21 years were fishermen (71.7%).

Based on the research results, it was found that most of the respondents were heavy smokers (64.2%). Furthermore, the distance of health facilities from the residence of the respondents is mostly <1 km (55.8%).

*Analysis of the Risk Factors of Pterygium for Fisherman*

Based on table 2, it can be seen that the length of time the respondents worked as fishermen had the risk of experiencing pterygium disease 3,980 times greater than the respondents who worked as fishermen < 21 years with a value of 95% CI = 1.404-11.284. This is statistically significant with *p*-value = 0.006.

Based on table 2, it is known that fishermen who are heavy smokers have a risk of experiencing pterygium disease 1.246 times greater than fishermen who are light smokers with a value of 95% CI = 0.559-2.778. This is

not statistically significant with  $p$ -value = 0.590.

Based on table 2, it can be seen that the distance between fishermen's residence and health facilities  $\geq 1$  km is at risk of experiencing

pterygium disease 5.133 times greater than the distance, 1 km with a value of 95% CI = 2.249-11.715. This is statistically significant with  $p$ -value = 0.000.

**Table 2.** Analysis of the Risk Factors of Pterygium for Fisherman Malabero Village, Bengkulu City from August to September 2020 using Chi Square Test.

Variables	Number of Respondents (n)		OR	$p$ -value	95% CI
	Case Group	Control Group			
<b>Duration as a Fisherman</b>			3.980	.006	1.404-11.284
< 21 Years Old	5	29			
$\geq 21$ Years Old	35	51			
<b>Smoking</b>			1.246	.590	0.559-2.778
Light Smoker	13	30			
Heavy Smoker	27	50			
<b>Distance of Health Facilities</b>			5.133	.000	2.249-11.715
< 1 km	12	55			
$\geq 1$ km	28	25			

Sources: Primary Data of Questionnaire, 2020.

## DISCUSSION

### *The Association Duration as a Fisherman with Pterygium Disease*

The results of this study found that there was a relationship with the length of time the respondents worked as fishermen with pterygium disease. This is due to the frequency of respondents being exposed to foreign objects such as UV rays, dust, wind and sand while working. Pterygium disease is increasing in areas with tropical climatic conditions and is also included in the equatorial zone between 300 north and south latitudes (Marcella, 2019).

The results of this study are in line with research by Rany (2017) which shows that fishermen with a long working period are at 7, 7 times more likely to suffer from pterygium disease.

The results obtained by researchers when conducting interviews were that most of the respondents did not use personal protective equipment on their face and eyes, especially when working, so that exposure to UV rays, dust, wind and sand would easily infect the eyes.

### *The Association of Smoking with Pterygium Disease*

The results of this study indicated that there was no significant relationship between smoking and pterygium disease. The results of this study are also in accordance with Ardianty's (2018) research which shows that there is no relationship between smoking habits and pterygium disease ( $p$ -value = .784).

The pterygium itself is a non-malignant fibrovascular growth of the conjunctiva that usually reaches a triangular cornea consisting of fibroelastic degeneration with dominant fibrotic proliferation. It has not been found whether or not there is a connection with exposure to cigarette smoke or substances contained in cigarettes with pterygium disease (Marcella, 2019).

The results of the study (Pan et al., 2019) also showed that there was no association between smoking and pterygium disease. Even in this study, smoking was a protective factor not a risk factor for pterygium disease.

### *The Association between Health Facilities and Pterygium Disease*

The results of this study showed a relationship between the distance of health facilities from the residence of respondents with pterygium disease. Respondents who have a distance of  $\geq 1$  km from health facilities are at greater risk than those who are  $< 1$  km away.

The results of the researchers' findings when conducting interviews with respondents indicated that there was a lack of involvement of health workers in providing education and information to the public regarding the pterygium disease. Even most people do not know what pterygium disease is.

The respondent's job as fishermen also makes them not maximal in utilizing health facilities. The working hours of those who have to go to sea in the afternoon and return only after midday make them unable to use the health facilities. They will only come to a health facility if their health condition is already seriously ill.

### CONCLUSION

There is a relationship between the length of time being a fisherman and the distance to health facilities with pterygium disease. The length of time working as a fisherman increases the risk of developing pterygium disease as the frequency of exposure to UV rays, dust, wind and sand increases. It is necessary to use personal protective equipment to reduce the risk of exposure and education from health workers so that the public can take good preventive measures.

### SUGGESTIONS

Pterygium disease can be prevented, one form of prevention is to reduce the risk of exposure to UV rays, dust, wind and sand when working. The longer working as a fisherman, the higher the risk of exposure. So it is important to use personal protective equipment such as sunglasses and also a wide hat that can protect the face and eyes.

There is a need for the participation of officers in health facilities in preventive

measures, the farther the health facilities are from where the community lives, the less information the community gets, so that people's knowledge regarding pterygium disease is also lacking. So there needs to be direct action such as counseling, education to fishermen groups.

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### DECLARATION OF CONFLICTING INTEREST

There is no conflict of interest in this study.

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### AUTHOR CONTRIBUTION

**Dwi Putri Sulistiya Ningsih:** Contribute to the completion of the article.

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