

Occupational Health Model for Traditional Fishermen in Batam City, Indonesia Modelo de salud ocupacional para pescadores tradicionales en la ciudad de Batam, Indonesia

Ice Irawati, Rasoel Hamidy, Zulfan Saam, Nofrizal, Zahtamal, M. Yulis Hamidy
Riau University (Indonesia)

Abstract. This study aims to describe the factors that influence health problems among traditional fishermen in Batam City, Indonesian. The research design used in this study is a cross-sectional study. The population of this study totaled 5,739 fishermen, with a total sample size of 285 taken using proportional sampling. Data collection using a questionnaire was carried out in September–December 2022. Data analysis used the chi-squared statistical test with the help of IBM SPSS Statistics 26 software. Results of the study This is the relationship between age, gender, education, years of service, length of work, fishermen's organisation, income, fishermen's insurance, health behaviour, work environment, and lifestyle in Occupational Health Problems.

Keywords: Traditional Fishermen, Occupational Health Problems

Resumen. Este estudio tiene como objetivo describir los factores que influyen en los problemas de salud entre los pescadores tradicionales en la ciudad de Batam, Indonesia. El diseño de investigación utilizado en este estudio es un estudio transversal. La población de este estudio fue de 5.739 pescadores, con un tamaño de muestra total de 285 tomados mediante muestreo proporcional. La recolección de datos mediante un cuestionario se llevó a cabo en septiembre-diciembre de 2022. El análisis de datos utilizó la prueba estadística chi-cuadrado con la ayuda del software IBM SPSS Statistics 26. Resultados del estudio Esta es la relación entre edad, género, educación, años de servicio, antigüedad laboral, organización de pescadores, ingresos, seguro de pescadores, comportamiento de salud, ambiente de trabajo y estilo de vida en salud ocupacional.

Palabras clave: Pescadores Tradicionales, Problemas de Salud Ocupacional

Fecha recepción: 04-03-23. Fecha de aceptación: 13-07-23

Ice Irawati
desaorang724@gmail.com

Introduction

Occupational health is an aspect or element of health that is closely related to the work environment and work and can directly or indirectly affect work efficiency and productivity (Tarwaka, 2014). The nature of occupational health as a tool to achieve optimal worker health status (in certain cases the highest, if the conditions are sufficient) for workers, farmers, fishermen, civil servants, entrepreneurs, administrators, or self-employed workers in all sectors of economic activity and non-formal, informal, and non-formal economies, and matters that aim to improve the welfare of the workforce as well as a tool to increase productivity, based on increasing human work power and productivity in production (Suma'mur, 2009).

Traditional fishermen are individuals whose job it is to catch fish using boats and simple fishing gear (Retnowati, 2011). These traditional fishermen are usually hereditary fishermen who catch fish to make ends meet (Purwanti, 2010). The fishing profession has not been able to become the livelihood desired by the community (Kasmiati, 2022).

Based on the report on the implementation of occupational health by the Ministry of Health of the Republic of Indonesia in 2022 in 36 Provinces, it stated that the number of cases of common diseases suffered by workers was recorded at 7,999,567 cases, and 929,745 cases were recorded due to work-related diseases. Furthermore, the Central Statistics Agency for Batam City in 2022 shows that out of 30 traditional fishermen in Batam City (Galang District, PadangBack District, and Bulang District), 15 people (50%) experience health problems due to poor fishermen's health behaviours, such as smoking and consuming alcohol, consuming less vegetables and fruit, and rarely or never having

a health check at the nearest health service centre.

Occupational safety and health are needed to create a sense of security and comfort so that workers (fishermen) can work well and work productivity increases. Increasing the performance of fishermen will have an impact on the income earned, so it will indirectly have an impact on the economy and the level of welfare of fishermen and their families (Dharmawirawan & Modjo, 2012).

In searching for occupational health literature, the study of occupational health in general can be found easily, as can tracing its origins, evolution, and significance in the field of occupational health. This is different from the literature on the occupational health of fishermen in electronic media, which is still very small. Based on these problems, it is necessary to conduct research on the factors that affect the working health of traditional fishermen, especially in Batam City. Researchers want to develop a study of the occupational health behaviour model of traditional fishermen in the city of Batam to improve the occupational health and lifestyle of fishermen.

Methodology

This type of research is analytic survey research using a cross-sectional Cross-sectional Study design. This research was conducted in Batam City, Riau Archipelago Province, Indonesia, in September–December 2022. In this study, the population was all fishermen in 3 Batam Hinterland sub-districts (District behind Padang 1,898, Bulang District 1,657, and Galang District 2,184), for a total of 5,739. Samples were taken using the proportional sampling method. Seeing that the population in this study was more than 100 people, the researchers took 10% of the population as a sample of

285 people. Details of the research sample were obtained from 95 people from Rear Padang District, 94 people from Bulang District, and 96 people from Galang District.

The instrument used in this study was a questionnaire adopted from the questions on the questionnaire adopted by Fahira and Susilawati (2022). The age instrument is measured by items: (1) > 64 years (Not Productive) and (2) 15–64 years (Productive). Gender instruments are measured based on two items: (1) male and (2) Female. Education instruments are measured based on two items: (1) low and (2) high. Instrument years of service is measured by the following items: (1) ≤ 3 years and (2) > 3 years. Length of work instruments are measured by items: (1) ≤ 8 o'clock and (2) > 8 o'clock. Fisherman Organisational Instruments based on items (1) do not exist and (2) do exist. Income instruments are measured based on items: (1) < rate salary Batam Government and (2) > rate salary Batam Government. Fisherman insurance instruments are measured based on two items: (1) none and (2) existence. The health behaviour instrument is measured based on two items: (1) negative and (2) positive. Work environment instruments are measured based on two items: (1) negative and (2) positive. The lifestyle instrument is measured based on two items: (1) negative and (2) positive.

The data analysis used was bivariate analysis using the Chi-square test for each research variable with the help of SPSS 26.

Result

Table 1 presents the respondent's information regarding the occupational health characteristics of traditional fishermen in Batam City. This table describes characteristics based on occupational health, age, gender, education, years of service, length of work, fishermen's organization, income, fishermen's insurance, work safety behavior, work environment, and lifestyle.

In Table 1, it is known that the majority of respondents are in the non-productive age range (> 64 years), as much as 51.9%, and the other 48.15% are in the productive age range (15–64 years). The majority of respondents' gender was male (98.2%), and the remaining 1.8% were female. Fishermen's education level is categorised as low if they have junior high school education and below, and high if they have high school education and tertiary education. The majority of respondents' working years were classified as new (≤ 3 years), as much as 56.8%, while 43.2% had long working years (> 3 years). The duration of work (duration of work) of the majority of respondents was between > 8 hours with a total of 57.2%, while the length of work ≤ 8 hours was 42.8%. In joining fishing organisations, the majority of respondents who did not join the organisation were 57.5, and as many as 42.5% joined the organisation. The majority of respondents earned rate salary at the Batam Government level of ≤ 4 million by 53%; only a small portion, namely 47%, earned income above rate salary at Batam Government. The majority of respondents do not have

fisherman's insurance, at 52.6%, and have insurance at 47.4%. The majority of respondents had positive safety behaviours of 48.8% and negative safety behaviours of 51.2%. The majority of respondents had (+) health behaviours of 51.6% and those with (-) health behaviours of 48.4%. The majority of respondents work in a work environment (+) of 52.6%, and those in a work environment (-) of 47.4%. The majority of respondents have an unhealthy lifestyle (+) of 50.9% and a healthy lifestyle (-) of 49.1.

Table 1.
Distribution of Respondents Based on Sociodemographic Characteristics.

Characteristics	n	%
Occupational Health Problems (Dependent)		
Yes	150	52,6
No	135	47,4
Age		
> 64 year (Non-Productive)	148	51.9
15-64 year (Productive)	137	48.1
Gender		
Male	280	98.2
Female	5	1.8
Education		
Low	157	55.1
High	128	44.9
Years of Service		
≤ 3 years	162	56.8
> 3 years	123	43.2
Length of Work		
≤ 8 o'clock	163	57.2
> 8 o'clock	122	42.8
Fisherman Organization		
do not exist	164	57.5
do exist	121	42.5
Income		
< rate salary Batam Government	151	53.0
> rate salary Batam Government	134	47.0
Fisherman Insurance		
None	150	52.6
existence	135	47.4
Occupational Safety Behaviour		
Positive	139	48.8
Negative	146	51.2
Work Environment		
Positive	150	52.6
Negative	135	47.4
Lifestyle		
No Health	145	50.9
Health	140	49.1
TOTAL RESPONDENTS	285	100.0

Hypothesis test

Relationship between Age and Occupational Health Problems

The basis for decision-making is bivariate analysis using the chi-square test between the variables of age and occupational health Problems.

Table 2.
Relationship between age and occupational health Problems

Variable	Occupational Health Problems				p Value
	Yes		No		
	n	%	n	%	
age					
> 64 years (Not Productive)	108	74,5	40	28,6	0,001
15-64 year (Productive)	37	25,5	100	71,4	
Total	145	100	140	100	

Based on table 2, the results of this study obtained that the age of fishermen who were included in the category >

64 years (unproductive) who suffered from health problems totaled 108 people and who did not suffer from health problems totaled 40 people. The age of fishermen in the 15-64 year (productive) category is 37 people who suffer from health problems and 100 people who do not suffer. Based on the table above, it is concluded that $p = 0.001$ is smaller than $\alpha = 0.05$. The results of the chi-square test show that there is a relationship between age and health problems in traditional fishermen.

Relationship between Gender and Occupational Health Problems

Basis for decision-making using bivariate analysis using the chi-square test between age and occupational health Problems.

Table 3.
Relationship between Gender and Occupational Health Problems

Variable	Occupational Health Problems				P Value
	Yes		No		
	n	%	n	%	
Gender					
Male	142	97,9	138	98,6	0,517
Female	3	2,1	2	1,4	
Total	145	100	140	100	

Based on Table 3, the results of this study showed that the number of men included in the category of men who suffered from health problems totaled 142, and those who did not suffer from health problems totaled 138. The sex of fishermen in the female category is 3 people who suffer from health problems and 2 people who do not suffer. Based on the table above, $p = 0.517$ is greater than $\alpha = 0.05$. The results of the chi-square test show that there is no relationship between gender and health problems in traditional fishermen.

The relationship between education and occupational health problems

The basis for decision-making is bivariate analysis using the chi-square test between the variables of education and occupational health problems.

Table 4.
Relationship between education and occupational health problems

Variable	Occupational Health Problems				P Value
	Yes		No		
	n	%	n	%	
Education					
Low	108	74,5	49	35,0	0,001
High	37	25,5	91	65,0	
Total	145	100	140	100	

Based on Table 4, the results of this study showed that the education level of fishermen who were included in the low education level category suffered from health problems, totaling 108 people, compared to 49 people who did not suffer from health problems. The education level of fishermen is in the higher education level category, with 37 people suffering from health problems and 91 people not

suffering from them. Based on the table above, it is concluded that $p = 0.001$ is smaller than $\alpha = 0.05$. The results of the chi-square test show that there is a relationship between education and health problems in traditional fishermen.

The relationship between years of service and occupational health problems

The basis for decision-making uses bivariate analysis using the chi-square test between the variables of years of service and occupational health problems.

Table 5.
Relationship between years of service and occupational health problems

Variable	occupational health problems				P Value
	Yes		No		
	n	%	n	%	
Years of service					
≤3 years	114	78,6	48	34,3	0,001
>3 years	31	21,4	92	65,7	
Jumlah	145	100	140	100	

Based on table 5, the results of this study obtained that the working period of fishermen who were included in the category of Years of service ≤ 3 years who suffered from health problems totaled 114 people and who did not suffer from health problems totaled 48 people. The working period of fishermen in the >3-year category included 31 people who suffered from health problems and 92 people who did not suffer. Based on the table above, it is concluded that $p = 0.001$ is smaller than $\alpha = 0.05$. The results of the chi-square test show that there is a relationship between length of work and health problems in traditional fishermen.

The relationship between length of work and occupational health problems

Dasar pengambilan keputusan menggunakan analisis bivariat dengan menggunakan uji chi-square antara variabel lama kerja dan masalah kesehatan kerja.

Table 6.
Relationship between length of work and occupational health problems

Variable	occupational health problems				P Value
	Yes		No		
	n	%	n	%	
length of work					
>8 o'clock	117	80,7	46	32,9	0,001
≤8 o'clock	28	19,3	94	67,1	
Jumlah	145	100	140	100	

Based on Table 6, the results of this study showed that the length of work of fishermen who were included in the category of working duration > 8 hours who suffered from health problems totaled 117 people and 46 people who did not suffer from health problems. The duration of work for fishermen in the ≤ 8-hour category is 28 for people who suffer from health problems and 94 for people who do not suffer. Based on the table above, it is concluded that $p = 0.001$ is smaller than $\alpha = 0.05$. The results of the chi-square test show that there is a relationship between length of work and health problems in traditional fishermen.

Relationship between Fishermen's Organizations and occupational health problems

The basis for decision-making uses bivariate analysis using the chi-square test between the variables of fishermen's organisations and occupational health problems.

Table 7. The relationship between Fishermen organisations and occupational health problems

Variable	occupational health problems				P Value
	Yes		No		
	n	%	n	%	
Fisherman Organization					
do not exist	113	77,9	51	36,4	0,001
do exist	32	22,1	89	63,6	
Total	145	100	140	100	

Based on Table 7, the results of this study obtained Fisherman organisations that were included in the non-organised category that suffered from health problems, totaling 113 people, and 51 people who did not suffer from health problems. Fishermen organisations with the category of being in an organisation who suffered from health problems totaled 32 people, and those who did not suffer totaled 89 people. Based on the table above, it is concluded that $p = 0.001$ is smaller than $\alpha = 0.05$. From the results of the chi-square test, it shows that there is a relationship between Fisherman organisations and health problems among traditional fishermen.

The relationship between income and occupational health problems

The basis for decision-making uses bivariate analysis using the chi-square test between income and occupational health problems.

Table 8. Relationship between income and occupational health problems

Variable	occupational health problems				P Value
	Yes		No		
	n	%	n	%	
Income					
< rate salary Batam Government	115	79,3	36	25,7	0,001
> rate salary Batam Government	30	20,7	104	74,3	
Total	145	100	140	100	

Based on Table 8, the results of this study obtained the income of fishermen who were included in the <rate salary batam government category who suffered from health problems totaling 115 people and who did not suffer from health problems totaling 36 people. The income of fishermen in the category > rate salary at the Batam government who suffered from health problems totaled 30 people, and those who did not suffer totaled 104 people. Based on the table above, it is concluded that $p = 0.001$ is smaller than $\alpha = 0.05$. From the results of the chi-square test, it shows that there is a relationship between fishermen's income and health problems among traditional fishermen.

The relationship between fisherman's insurance and occupational health problems

The basis for decision-making uses bivariate analysis using the chi-square test between the Fisherman insurance variable and occupational health problems.

Table 9. The relationship between fisherman's insurance and occupational health problems

Variable	occupational health problems				P Value
	Yes		No		
	n	%	n	%	
Fisherman Insurance					
No	105	72,4	45	32,1	0,001
yes	40	27,6	95	67,9	
Total	145	100	140	100	

Based on table 9, the results of this study obtained fisherman's insurance, which was included in category no, for those who suffered from health problems totaling 105 people and for those who did not suffer from health problems totaling 45 people. Fisherman's insurance covers 40 people who suffer from health problems and 95 people who do not suffer. Based on the table above, it is concluded that $p = 0.001$ is smaller than $\alpha = 0.05$. The results of the chi-square test show that there is a relationship between fisherman's insurance and health problems among traditional fishermen.

Relationship between Occupational Safety Behaviour and occupational health problems

The basis for decision-making uses bivariate analysis using the chi-square test between occupational safety behaviour and occupational health problems.

Table 10. Relationship between Occupational Safety behaviour and occupational health problems

Variable	occupational health problems				P Value
	Yes		No		
	n	%	n	%	
Occupational Safety Behaviour					
Positive	117	80,7	30	21,4	0,001
Negative	28	19,3	110	78,6	
Total	145	100	140	100	

Based on Table 10, the results of this study obtained occupational safety behaviour of fishermen who were included in the Positive category and suffered from health problems totaling 117 people and who did not suffer from health problems totaling 30 people. Occupational Safety behaviour of fishermen in the Negative category: those who suffer from health problems are 28 people, and those who do not suffer are 110 people. Based on the table above, it is concluded that $p = 0.001$ is smaller than $\alpha = 0.05$. From the results of the chi-square test, it shows that there is a relationship between the occupational safety behaviour of fishermen and health problems among traditional fishermen.

The relationship between the Work Environment and occupational health problems

The basis for decision-making uses bivariate analysis using the chi-square test between work environment variables and occupational health problems.

Table 11.
Relationship between work environment and occupational health problems

Variable	occupational health problems				P Value
	Yes		No		
	n	%	n	%	
Work Environment					
Positive	117	80,7	33	23,6	0,001
Negative	28	19,3	107	76,4	
Total	145	100	140	100	

Based on Table 11, the results of this study obtained the work environment of fishermen who were included in the Positive category and suffered from health problems, totaling 117 people, and those who did not suffer from health problems, totaling 33 people. The work environment of fishermen is in the Negative category, with 28 people suffering from health problems and 107 people not suffering. Based on the table above, it is concluded that $p = 0.001$ is smaller than $\alpha = 0.05$. From the results of the chi-square test, it shows that there is a relationship between fishermen's work environment and health problems in traditional fishermen.

Relationship between Lifestyle and occupational health problems

The basis for decision-making uses bivariate analysis using the chi-square test between lifestyle variables and occupational health problems.

Table 12.
Relationship between lifestyle and occupational health problems

Variable	occupational health problems				P Value
	Yes		No		
	n	%	n	%	
Lifestyle					
No Health	111	76,6	34	24,3	0,001
Health	34	23,4	106	75,7	
Jumlah	145	100	140	100	

Based on Table 12, the results of this study obtained the lifestyle of fishermen who were included in the no health category and suffered from health problems, totaling 111 people, and those who did not suffer from health problems, totaling 34 people. In the health category, there were 34 people who suffered from health problems and 106 who did not suffer. Based on the table above, it is concluded that $p = 0.001$ is smaller than $\alpha = 0.05$. The results of the chi-square test show that there is a relationship between fishermen's lifestyle and health problems in traditional fishermen.

Discussion

The relationship between age and occupational health problems

The results showed a positive and significant relationship between age and occupational health problems. This result is proven by the results showing that from the chi-squared test, the p-value is smaller than α ($0.001 < 0.005$), so there is a significant relationship between age and occupational health problems. Thus, the level of age affects occupational health problems in the samples analysed.

In accordance with Zytoon & Basahel's research (2017), the elderly group shows the highest incidence of disease, followed by middle-aged and young fishermen. This trend is a risk factor associated with ageing workers, such as longer exposure to occupational hazards and greater risks to develop long-term or chronic illness or disability. Musculoskeletal problems and vision, hearing, gastrointestinal, urinary, respiratory, and genital tract problems are the most common illnesses among fishers. In Moore's research (1969) and Saadawy et al. (2014), there is a significant difference between the two age groups: The highest rate of disability occurs at the age of 61–70 years, and the lowest is at the age group of 21–30 years.

Relationship between Gender and Occupational Health Problems

The results showed a positive but insignificant relationship between gender and occupational health problems. This result is proven by the results showing that from the chi-squared test, the p-value is greater than α ($0.517 > 0.005$), so there is no significant relationship between gender and occupational health problems. Thus, gender does not affect occupational health problems in the samples analysed. This is in line with research conducted by Gómez-Baya et al. (2018), which found that the effect of gender on health problems is partly mediated by satisfaction of global basic needs and job satisfaction, so that gender does not have a significant direct effect.

The relationship between education and occupational health problems

The results showed a positive and significant relationship between education and occupational health problems. This result is proven by the results showing that from the chi-squared test, the p-value is smaller than α ($0.001 < 0.005$), so there is a significant relationship between education level and occupational health problems. Thus, the level of education affects occupational health problems in the samples analysed. This result is in line with the results of research by Endriastuty and Adawia (2018), where it was found that there was a significant relationship between the level of education and knowledge about occupational health and safety and a culture of occupational health and safety with a value of $p = 0.00$. According to Pampel, Krueger, and Denney (2010), a lack of knowledge and access to information causes a person to have limited knowledge about the dangers of unhealthy behaviour, so they lack motivation to adopt healthy behaviours.

The relationship between years of service and occupational health problems

The results showed a positive and significant relationship between work tenure and occupational health problems. This result is proven by the results showing that from the chi-squared test, the p-value is smaller than α ($0.001 < 0.005$), so there is a significant relationship between the level of years of service and occupational health problems.

Thus, years of service affected occupational health problems in the samples analysed. Cahyawati & Budiono (2011) said a person's tenure determines his level of experience in mastering his job. Natasha, Irawati, and Hidayat (2020) said length of service can affect the fatigue of workers who work as fishermen.

The relationship between length of work and occupational health problems

The results showed a positive and significant relationship between length of work and occupational health problems. This result is proven by the results showing that, from the chi-squared test, the p-value is smaller than α ($0.001 < 0.005$), so there is a significant relationship between the level of length of work and occupational health problems. Thus, length of work affected occupational health problems in the samples analysed. Wurarah, Kawatu, & Akili (2020) described occupational health as a tool to achieve the optimal health status of the workforce (in certain cases, it may be as high as possible if the necessary conditions are sufficient) for workers, farmers, fishermen, employees, employers, managers, or casual workers in all sectors of formal, informal, and non-informal economic and non-economic activities, and matters that aim to improve the welfare of the workforce, as well as a tool to increase productivity based on improving work power and human productivity in production. Wong, Chan, and Ngan (2019) revealed that the work environment is a condition that can have a detrimental effect on the health or welfare of people who work.

Relationship between Fishermen's Organizations and occupational health problems

The results showed a positive and significant relationship between Fishermen's Organisations and occupational health problems. This result is proven by the results showing that from the chi-square the p-value is smaller than α ($0.001 < 0.005$), so there is a significant relationship between Fishermen's Organisations and occupational health problems. Thus, fishing organisations influence occupational health problems in the samples analysed. The organisation is a forum for cooperation to achieve common goals with a certain pattern whose embodiment has both physical and non-physical wealth. With the existence of a group of fishermen organisations or cooperatives, it is hoped that many benefits will be obtained by respondents related to occupational safety and health, such as obtaining assistance with safety and health equipment, occupational safety and health counselling for fishermen groups, as well as other assistance that is handed over to fishermen who are members of cooperative organisations or groups or fishermen who have a forum (Fishermen's group) (Lu, Sajiki, & Yagi, 2020).

The relationship between income and occupational health problems

The results showed a positive and significant relationship

between income and occupational health problems. This result is proven by the results showing that from the chi-squared test, the p-value is smaller than α ($0.001 < 0.005$), so there is a significant relationship between income and occupational health problems. Thus, income affects occupational health problems in the sample analysed. Lestari, Samidah, and Diniarti (2022) explained that high family income will affect the decision-making process in seeking better health services in order to improve health status.

The relationship between Fishermen's Insurance and occupational health problems

The results showed a positive and significant relationship between Fisherman's Insurance and occupational health problems. This result is proven by the results showing that from the chi-squared test, the p-value is smaller than α ($0.001 < 0.005$), so there is a significant relationship between Fisherman Insurance and occupational health problems. Thus, Fisherman's Insurance affects occupational health problems in the samples analysed. Rani (2017) explains that fishermen's insurance is insurance specifically intended for someone who works as a fisherman. Insurance activities in Indonesia are still relatively low, especially for small fishermen. Respondents' lack of knowledge about insurance prevented fishermen from enrolling in the insurance programme and considered the programme unprofitable for them. On the other hand, with fishermen's insurance, of course, there are many benefits, including those related to the health of fishermen.

Relationship between work safety behavior and occupational health problems

The results showed a positive and significant relationship between Work Safety behaviour and occupational health problems. This result is proven by the results showing that from the chi-squared test, the p-value is smaller than α ($0.001 < 0.005$), so there is a significant relationship between work safety behaviour and occupational health problems. Thus, work safety behaviour affects occupational health problems in the samples analysed. Dennerlein et al.'s (2020) research regarding risk factors for the safety and health of fishermen states that the observed effects of occupational safety behaviour are causally related to diet, smoking, and exercise, which in turn are related to certain working conditions and culture in large-scale fishing. Thus, interventions designed to improve the working conditions of small-scale fishermen can help reduce the number of work accidents, which in turn can have a positive impact on their health.

The relationship between the work environment and occupational health problems

The results showed a positive and significant relationship between the work environment and occupational health problems. This result is proven by the results showing that the p-value of the chi-square is smaller than α

($0.001 < 0.005$), so there is a significant relationship between the Work Environment and occupational health problems. Thus, the Work Environment affects occupational health problems in the samples analysed. This is in line with the results of research conducted by Dewi, Raharjo, and Wahyuningsih (2021), who say that the workplace is inseparable from various potential work environment hazards that can affect the safety and health of workers. In order to support the realisation of occupational safety and health efforts, standards for the implementation of occupational health are needed. With this standardisation, it is hoped that it can minimise the occupational health problems of fishermen.

The relationship between Lifestyle and occupational health problems

The results showed a positive and significant relationship between Lifestyle and occupational health problems. This result is proven by the results showing that from the chi-squared test, the p-value is smaller than α ($0.001 < 0.005$), so there is a significant relationship between Lifestyle and occupational health problems. Thus, Lifestyle affects occupational health problems in the samples analysed. This is in line with what was revealed by Winona Pit and Hansen (2016): that lifestyle is also an important factor that greatly influences the lives of fishermen and is closely related to occupational health problems, especially in productive-age fishermen. Factors causing occupational health problems in productive age are due to unhealthy lifestyles such as diet, lack of physical activity, and smoking.

Conclusions

Based on the results of the research conducted, it can be concluded: (1) There is a significant relationship between age and occupational health problems among traditional fishermen in Batam City. (2) There is no significant relationship between gender and occupational health problems among traditional fishermen in Batam City. (3) There is a significant relationship between education and occupational health problems among traditional fishermen in Batam City. (4) There is a significant relationship between years of service and occupational health problems among traditional fishermen in Batam City. (5) There is a significant relationship between length of work and occupational health problems among traditional fishermen in Batam City. (6) There is a significant relationship between fishermen's organisations and occupational health problems among traditional fishermen in Batam City. (7) There is a significant relationship between income and occupational health problems among traditional fishermen in Batam City. (8) There is a significant relationship between Fisherman's Insurance and occupational health problems among traditional fishermen in Batam City. (9) There is a significant relationship between Occupational Safety behaviour and occupational health problems among traditional fishermen in Batam City. (10) There is a significant relationship between the Work

Environment and occupational health problems among traditional fishermen in Batam City. (11) There is a significant relationship between Lifestyle and occupational health problems among traditional fishermen in Batam City.

Recommendation

Based on the research conducted, it can be recommended that fishermen pay more attention to and understand what factors can influence the emergence of health problems based on the research results that have been disclosed. (2) The government provides more technical assistance to fishermen so that they can reduce risks or prevent health problems from occurring. (3) For future research, it is hoped that it can perfect or complement the research by making improvements or adding variables to be used, such as the use of Personal Protective Equipment, personal hygiene, and other variables, to find out what factors cause occupational health problems.

Limitations

This study only analyses factors related to occupational health problems, which consist of variables such as age, gender, education, years of service, length of work, fishing organisations, income, fishermen's insurance, health behaviour, work environment, and lifestyle.

References

- Ayunda, N., Sapota, M. R., & Pawelec, A. (2018). The impact of small-scale fisheries activities toward fisheries sustainability in Indonesia. *Interdisciplinary Approaches for Sustainable*
- Dennerlein, J. T., Burke, L., Sabbath, E. L., Williams, J. A., Peters, S. E., Wallace, L., ... & Sorensen, G. (2020). An integrative total worker health framework for keeping workers safe and healthy during the COVID-19 pandemic. *Human factors*, 62(5), 689-696. <https://doi.org/10.1177/0018720820932699>
- Dewi, W. C., Raharjo, M., & Wahyuningsih, N. E. (2021). Literatur Review: Hubungan Antara Kualitas Udara Ruang Dengan Masalah Kesehatan Pada Pekerja. *An-Nadaa: Jurnal Kesehatan Masyarakat (e-Journal)*, 8(1), 88-94. <http://dx.doi.org/10.31602/ann.v8i1.4815>
- Development Goals: Economic Growth, Social Inclusion and Environmental Protection, 147-167. https://doi.org/10.1007/978-3-319-71788-3_11
- Cahyawati, I. N., & Budiono, I. (2011). Faktor yang berhubungan dengan kejadian dermatitis pada nelayan. *KEMAS: Jurnal Kesehatan Masyarakat*, 6(2). <https://doi.org/10.15294/kesmas.v6i2.1766>
- Dharmawirawan, D. A., & Modjo, R. (2012). Identifikasi Bahaya Keselamatan dan Kesehatan Kerja pada Penangkapan Ikan Nelayan Muroami. *Kemas: Jurnal Kesehatan Masyarakat Nasional (National Public Health Journal)*, 6(4), 185-192. <http://dx.doi.org/10.21109/kesmas.v6i4.98>
- El-Saadawy, M. E. S., Soliman, N. E. L., El-Tayeb, I. M. M., & Hammouda, M. A. (2014). Some occupational health hazards among fishermen in Alexandria city: Iskenderiye Şehrindeki balıkçılar arasında bazı mesleki sağlık tehlikeleri. *European*

- Journal of Therapeutics, 20(1), 71-78. <https://doi.org/10.5455/GMJ-30-44689>
- Endriastuty, Y., & Adawia, P. R. (2018). Analisa hubungan antara tingkat pendidikan, pengetahuan tentang K3 terhadap budaya K3 pada perusahaan manufaktur. *Jurnal Ecodemica*, 2(2), 193-201. <https://doi.org/10.31294/jeco.v2i2.4014>
- Fahira, A. D., & Susilawati, S. (2022). Penyakit kulit yang diderita nelayan Desa Kalinaun Kecamatan Likupang Timur Kabupaten Minahasa Utara. *Nautical: Jurnal Ilmiah Multidisiplin Indonesia*, 1(6), 471-474. <https://doi.org/10.55904/nautical.v1i6.369>
- Folgado dos Santos, J. M., Domingues, A. ., Batista, M., Serrano, J., Honório, S., Rente, I., & Petrica, J. (2023). The relationship between basic psychological needs and autonomous motivation in the coach's leadership style on the subjective well-being of Special Olympics adapted sports athletes. *Retos*, 50, 15–24. <https://doi.org/10.47197/retos.v50.99633>
- Frantzeskou, E., Kastania, A. N., Riza, E., Jensen, O. C., & Linos, A. (2012). Risk factors for fishermen's health and safety in Greece. *International maritime health*, 63(3), 155-161. https://journals.viamedica.pl/international_maritime_health/article/view/26141
- García-Chaves, D. C., Corredor-Serrano, L. F., & Diaz Millan, S. (2023). Relationship between explosive strength, body composition, somatotype and some physical performance parameters in rugby sevens players. *Retos*, 47, 103–109. <https://doi.org/10.47197/retos.v47.95549>
- Gómez-Baya, D., Lucia-Casademunt, A. M., & Salinas-Pérez, J. A. (2018). Gender differences in psychological well-being and health problems among European health professionals: Analysis of psychological basic needs and job satisfaction. *International journal of environmental research and public health*, 15(7), 1474. <https://doi.org/10.3390/ijerph15071474>
- Juster, R. P., & Lupien, S. (2012). A sex-and gender-based analysis of allostatic load and physical complaints. *Gender Medicine*, 9(6), 511-523. <https://doi.org/10.1016/j.genm.2012.10.008>
- Kaerlev, L., Jensen, A., & Hannerz, H. (2014). Surveillance of hospital contacts among Danish seafarers and fishermen with focus on skin and infectious diseases-A population-based cohort study. *International journal of environmental research and public health*, 11(11), 11931-11949. <https://doi.org/10.3390/ijerph11111931>
- Kasmianti, S. (2022). Deskripsi Tingkat Kesejahteraan Masyarakat Nelayan. *Jurnal Penelitian Pendidikan Geografi*, 7(4), 142-146. <https://doi.org/10.36709/jppg.v7i4.74>
- Lawrie, T., Matheson, C., Ritchie, L., Murphy, E., & Bond, C. (2004). The health and lifestyle of Scottish fishermen: a need for health promotion. *Health Education Research*, 19(4), 373-379. <https://doi.org/10.1093/her/cyg045>
- Lestari, W., Samidah, I. ., & Diniarti, F. (2022). Hubungan Pendapatan Orang Tua dengan Kejadian Stunting di Dinas Kesehatan Kota Lubuklinggau. *Jurnal Pendidikan Tambusai*, 6(1), 3273–3279. Retrieved from <https://jptam.org/index.php/jptam/article/view/3388>
- Lu, Y. H., Sajiki, T., & Yagi, N. (2020). Factors affecting fisherman satisfaction with fishermen's self-governance organizations: A case study of the Taiwan Donggang Sakuraebi (Sergia lucens) production and management group. *Marine Policy*, 115, 103819. <https://doi.org/10.1016/j.marpol.2020.103819>
- Natashia, D., Irawati, D., & Hidayat, F. (2020). Fatigue Dan Kualitas Hidup Pada Pasien Gagal Ginjal Kronis Dengan Terapi Hemodialisa. *Jurnal Keperawatan Muhammadiyah*, 5(2). <http://dx.doi.org/10.30651/jkm.v5i2.6540>
- Pampel, F. C., Krueger, P. M., & Denney, J. T. (2010). Socio-economic disparities in health behaviors. *Annual review of sociology*, 36, 349-370. <https://doi.org/10.1146/annurev.soc.012809.102529>
- Pena, P. G. L., & Gomez, C. M. (2014). Health of subsistence fishermen and challenges for Occupational Health Surveillance. *Ciência & Saúde Coletiva*, 19, 4689-4698. <https://doi.org/10.1590/1413-812320141912.13162014>
- Percin, F., Akyol, O., Davas, A., & Saygi, H. (2012). Occupational health of Turkish Aegean small-scale fishermen. *Occupational medicine*, 62(2), 148-151. <https://doi.org/10.1093/occmed/kqr181>
- Purwanti, P. (2010). Model Ekonomi Rumah Tangga Nelayan Skala Kecil dalam Mencapai Ketahanan Pangan: Analisis Simulasi Kebijakan. Universitas Brawijaya Press.
- Rani, M. (2017). INSURANCE PROTECTION FOR FISHERMEN. *Jurnal Selat*, 4(1), 1–14. Retrieved from <https://ojs.umrah.ac.id/index.php/selat/article/view/146>
- Retnowati, E. (2011). Nelayan indonesia dalam pusaran kemiskinan struktural (perspektif sosial, ekonomi dan hukum). *Perspektif*, 16(3), 149-159. <https://doi.org/10.30742/perspektif.v16i3.79>
- Rismadi, K., Siagian, A., & Siregar, F. A. (2021). Pengaruh Penghasilan Dan Gaya Hidup Terhadap Kejadian Hipertensi Pada Nelayan Di Kota Medan. *Jurnal Health Sains*, 2(3), 328-342. <https://doi.org/10.46799/jhs.v2i3.133>
- Sri Suyati, E. ., Sonedi, S., Bulkani, B., Fatchurahman, M. ., Nurbudiyani, I., & Setiawan, M. A. (2022). The relationship of physical fitness and social-economic status and students' learning achievement. *Retos*, 46, 494–500. <https://doi.org/10.47197/retos.v46.93808>
- Subarjo, P. M., Ratu, J. M., & Setyobudi, A. (2021). Profil Kesehatan Kerja Nelayan Tangkap di Desa Papela Kecamatan Rote Timur Kabupaten Rote Ndao. *Media Kesehatan Masyarakat*, 3(2), 138-145. <https://doi.org/10.35508/mkm.v3i2.3729>
- Suma'mur, P. K. (1981). Keselamatan kerja dan pencegahan kecelakaan. Gunung Agung.
- Tarwaka, K. (2014). Kesehatan Kerja Manajemen dan Implementasi K3 di Tempat Kerja. HarapanPress, Surakarta.
- Winona Pit, S., & Hansen, V. (2016). The relationship between lifestyle, occupational health, and work-related factors with presenteeism amongst general practitioners. *Archives of environmental & occupational health*, 71(1), 49-56. <https://doi.org/10.1080/19338244.2014.998329>
- Wong, K., Chan, A. H., & Ngan, S. C. (2019). The effect of long working hours and overtime on occupational health: a meta-analysis of evidence from 1998 to 2018. *International journal of environmental research and public health*, 16(12), 2102. <https://doi.org/10.3390/ijerph16122102>
- Wurarah, M. L., Kawatu, P. A., & Akili, R. H. (2020). Hubungan antara beban kerja dengan kelelahan kerja pada petani. *Indonesian Journal of Public Health and Community Medicine*, 1(2), 006-010. <https://doi.org/10.35801/ijphcm.1.2.2020.28661>
- Zytoon, M. A., & Basahel, A. M. (2017). Occupational safety and health conditions aboard small-and medium-size fishing vessels: Differences among age groups. *International journal of environmental research and public health*, 14(3), 229. <https://doi.org/10.3390/ijerph14030229>