



Musculoskeletal disorders problems and its relation to age, working periods, and smoking habit among fishermen

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ARTICLE INFO

Article history:

Received 28 June 2021

Accepted 30 July 2021

Keywords:

Musculoskeletal disorders

Fishermen

Workers age

Working periods

Smoking habit

ABSTRACT

Objective: In this study, we conducted a research to determine the relationship between ages, working period, and smoking habit with the musculoskeletal disorder in fishermen.

Method: This type of research is analytic survey research with a cross-sectional study. The population in this study totaled 224 people with 56 samples as respondents. Nordic Body Map (NBM) and Rapid Entire Body Assessment (REBA) were used as a questionnaire instrument.

Results: The result showed that the age variable has $p = 0.658$ and the smoking habit has $p = 1.000$, this indicates that age and smoking habit variables do not have a significant relationship with musculoskeletal disorders. Meanwhile, the working period variable has a result of $p = 0.015$, it can be said that the work period has a significant relationship with musculoskeletal disorders.

Conclusion: The respondents who were quite old were still fit for work and did not have as many musculoskeletal complaints as they should be for their age. Likewise with the smoking habit of fishermen who are more enthusiastic and motivated to work. Meanwhile, the work period has more influence on the complaints of musculoskeletal disorders among fishermen.

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Introduction

Marine fishing work is one of the most dangerous job because it has a high risk of occupational accidents and occupational disease. Conducted research on occupational safety and health conditions (OSH) aboard marine fishing vessels is scarce. In a 2014, the Food and Agriculture Organization (FAO) assessed that 39.4 million people acted for angling for 2012, of whom 18.4 million were engaged in marine fishing. The total number of ocean liners is assessed at 3.2 million, and around 79%, 18%, and 3% of motorized marine vessels are small vessels (less than 12 m lengths), medium vessels (between 12 and 24 m lengths), and large vessels (more length of 24 m).¹

Data from the European Working Conditions Survey in 2010 the fisheries sector shows that cases of musculoskeletal disorders have a high ranking, namely Musculoskeletal Disorders of the shoulders, arms, and neck, which was reported by more than half of respondents in the fisheries sector. The fact that musculoskeletal disorders are more common in fisheries than in any other sector. In general, bone, joint or muscle problems that primarily affect the back are more common than with breathing.²

Musculoskeletal disorders are the diseases most commonly suffered by Occupational Health Efforts Post fishermen members including pain/pain in muscles, back, waist, knees, calves, feet, myalgia/body aches, joint pain, and neck tension. Based on data

from the results of health checks carried out, there are various diseases and health complaints from members of the Occupational Health Efforts Post while doing their job. Data on the results of examinations at the fishermen's Occupational Health Efforts Post in 2019, as many as 198 fishermen experienced musculoskeletal disorders.

The job demand leads to various musculoskeletal problems to fishermen mainly involving the shoulder, back, knee, and hand. Constant bending action and lifting heavy weights puts excessive strain on the back leading to have back pain. Shoulder pain may also occur due to heavy weight lifting and repeated throwing and pulling of the net from the water.³ A research found that nonergonomics positions might be associated with MSDs.⁴ Besides that, some researchers reported that there was a relationship between individual characteristics and smoking habits with musculoskeletal disorders.⁵

The objective of this study was to determine the relation between musculoskeletal disorders (MSDs) with age, work period, and Smoking Habit in fishermen at the Occupational Health Efforts Post in Maros Regency.

Methods

This type of research is analytical survey research with cross-sectional study design. The research population is all members of the fishing Occupational Health Efforts Post in Maros Regency totaling 224 fishers and 56 workers as a sample. Sampling when this research was taking place was carried out by accidental sampling by taking respondents who happened to be at the research location. This study uses the Nordic Body Map (NBM), Rapid Entire Body Assessment (REBA) questionnaire instrument, scales, and stature meter tools. The method of data collection in this study

Peer-review under responsibility of the scientific committee of the 3rd International Nursing, Health Science Students & Health Care Professionals Conference. Full-text and the content of it is under responsibility of authors of the article.

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Table 2
Age distribution of workers.

Ages	Frequency (n)	Percentage (%)
Old	41	73.2
Young	15	26.8
Total	56	100

Source: Primary Data, 2020.

Table 1
Respondents musculoskeletal complaints.

Musculoskeletal disorders category	Frequency (n)	Percentage (%)
There are complaints	27	48.2
No complaints	29	51.8
Total	56	100

Source: Primary Data, 2020.

was carried out by asking for basic data regarding the number of fishermen's Occupational Health Efforts Post in Maros Regency through the Health Office and Public Health Center, then asking for assistance from the participation of managers of the Public Health Center occupational health program and the head and cadres of the Occupational Health Efforts Post to meet with members of the Occupational Health Efforts Post fisherman. Processing and data analysis in this study was carried out using computerization through the SPSS program. Analysis of the data in this study using the Chi-square analysis technique.

Results

Distribution of respondents based on musculoskeletal complaints

Musculoskeletal disorders were obtained from the results of measurements using Nordic Body Map, then categorized into two groups with no complaints category (no pain with 0 as score) and with complaints (mild pain = 1, moderate pain = 2, and severe pain = 3). The data presentation of the distribution of respondents based on musculoskeletal disorders can be seen in Table 1.

The results showed that the musculoskeletal disorders category of 56 respondents, which were included in the no complaints category as many as 29 respondents (51.8%) than those included in the no complaints category as many as 27 respondents (48.2%).

Analysis of the relation between age and musculoskeletal disorders

The age of the fishermen is calculated based on the date of birth to the date the research was carried out. The age of the fishermen who became respondents ranged from 18 to 69 years. Based on the results of the analysis conducted, it shows that in the age category of 56 respondents, those who are in the old category are higher, namely 41 respondents (73.2%) than those who are in the young category as many as 15 respondents (26.8%) (Table 2).

Table 3
Results of the analysis of the relationship between age and musculoskeletal disorders.

Ages	Musculoskeletal disorders				Total		p-value
	There are complaints		No complaints		n	%	
	n	%	n	%			
Old	21	51.2	20	48.8	41	100	0.552
Young	6	40	9	60	15	100	
Total	27	48.2	29	51.8	56	100	

Source: Primary Data, 2020.

Table 4
Working period distribution of workers.

Working period category	Frequency (n)	Percentage (%)
Old workers	41	73.2
New workers	15	26.8
Total	56	100

Source: Primary Data, 2020.

For the analysis of the relationship between age and musculoskeletal disorder in fishermen, data was obtained that of the 41 respondents who were in the old category, there were 21 respondents (51.2%) who had complaints, and 20 respondents (48.8%) who had no complaints. Of the 15 respondents who fall into the young age category, there are 6 respondents (40%) who have complaints and 9 respondents (60%) who have no complaints (Table 3).

Based on the results of statistical analysis using the Chi-square test, in the Chi-Square Test table the value of Continuity Correction = 0.195 with a value of $p = 0.658$ where the value of $p > 0.05$. So it can be concluded that age does not have a significant relationship with musculoskeletal disorders in fishermen at the fishermen Occupational Health Efforts Post in Maros Regency in 2020.

Analysis of relation between working periods and musculoskeletal disorders

The working periods of fishermen are calculated from the time they started working as fishermen until the time this research was conducted. The working period of fishermen who became respondents ranged from 5 to 53 years. The results showed that in the working tenure category of 56 respondents, those included in the old category were higher, namely 41 respondents (73.2%) compared to 15 respondents (26.8%) who entered the new category (Table 4).

Based on the research conducted, data on the relationship between working tenure and musculoskeletal disorders in fishermen showed that of the 41 respondents who were included in the long service period, there were 24 respondents (58.5%) who had complaints and 17 respondents (41.5%) for which there are no complaints. Of the 15 respondents who were included in the new tenure category, there were 3 respondents (20%) who had complaints and there were 12 respondents (80%) who had no complaints.

Based on the results of statistical analysis using the Chi-square test, in the Chi-Square Test table, Fisher's Exact Test value is $p = 0.015$, where p -value < 0.05 . So it can be concluded that tenure has a significant relationship with musculoskeletal disorders in fishermen at the Maros Regency fishermen Occupational Health Efforts Post in 2020 (Table 5).

Analysis of the relation between smoking habit and musculoskeletal disorders

The smoking habit is obtained from the smoking behavior of fishermen which is categorized into two groups, namely smoking/

Table 5
Results of the analysis of the relationship between working period and musculoskeletal disorders.

Working period category	Musculoskeletal disorders				Total		p-value
	There are complaints		No complaints		n	%	
	n	%	n	%			
Old workers	24	58.5	17	41.5	41	100	0.015
New workers	3	20	12	80	15	100	
Total	27	48.2	29	51.8	56	100	

Source: Primary Data, 2020.

Table 6
Working period distribution of workers.

Smoking habit category	Frequency (n)	Percentage (%)
Smoke	51	91.1
Do not smoke	5	8.9
Total	56	100

Source: Primary Data, 2020.

never smoking and not smoking. The data shows that in the smoking habit category of 56 respondents, those in the smoking category were higher, namely as many as 51 respondents (91.1%) than 5 respondents (8.9%) who were in the non-smoking category (Table 6).

Based on the research results, data on the relationship between smoking habits and musculoskeletal disorders in fishermen were obtained. The data was processed that of the 51 respondents who fell into the smoking category, there were 25 respondents (49%) who had complaints and 26 respondents (51%) who had no complaints. Of the 5 respondents who fall into the non-smoking category, there are 2 respondents (40%) who have complaints and there are 3 respondents (60%) who have no complaints.

Based on the results of statistical analysis using the Chi-square test on the Chi-square test table, Fisher's Exact Test value with p -value = 1000 where p value > 0.05. So it can be concluded that smoking habits do not have a significant relationship with musculoskeletal disorders in fishermen at the Maros Regency fishermen Occupational Health Efforts Post in 2020 (Table 7).

Discussion

Age is one of the factors in an individual that can affect the occurrence of musculoskeletal disorders in a person.⁶ However, in this study, it was found that the age variable did not have a significant relationship with musculoskeletal disorders among fishermen in the occupational health effort of fishermen in Maros Regency. This is probably due to the large number of fishermen who have old age where they have the risk of experiencing musculoskeletal disorders, but they are still productive in carrying out their work and rarely experience musculoskeletal complaints.

Also, through training and coaching activities carried out by local agencies/governments, some fishermen have become more

aware of the environment and work tools so that they can make adjustments and be innovative in making efforts to prevent the risk of illness due to work. This research is in line with research conducted by Rani on fishermen in Tidore Village where the research obtained p -value = 0.224 where $p > 0.05$, indicates that age has no significant relationship with musculoskeletal disorders.⁷

The physical strength of fishermen can also affect so that age has no relationship with musculoskeletal disorders. Physiologically, some humans are born with muscle structures that have stronger physical strength than others. In these different strength conditions, if you have to do work that requires muscle exertion, it is clear that those who have low strength will be more susceptible to the risk of muscle injury, and those who have high muscle strength have a smaller risk of muscle injury.⁸

Besides, the method used when examining musculoskeletal disorders in fishermen uses the Nordic Body Map questionnaire, which is one of the drawbacks of this study. In the Nordic Body Map questionnaire, the complaints felt by fishermen are examined based on their feelings by pointing to the location or position of the body parts experiencing pain and the level of pain/pain that is felt, not done by medical examination, so the answers given cannot describe the actual condition of musculoskeletal disorders.

The results of the study on the variable of the working period showed that there was a significant relationship with complaints of musculoskeletal disorders among fishermen at the fishermen's occupational health care post in Maros Regency. The results of this research are in line with the existing research by Bae from Korea Working period is a combination factor that contributes to musculoskeletal complaints. The disease or injury disorders in the musculoskeletal system rarely occur directly, but rather a continuous accumulation of every activity that workers do when working over a relatively long period.⁹

The relationship between the work period and musculoskeletal disorders in this study is because more respondents have a long working period than new workers. Fishermen are doing their work in an unnatural position, this is because their work environment is above water and their means of transportation are small/traditional boats with very limited space for movement where they are exposed to potential hazards for longer while doing their work.

Also, some fishing gears that are often used are still traditional, namely, in the form of nets and porches, where these tools still

Table 7
Results of the analysis of the relationship between smoking habit and musculoskeletal disorders.

Smoking habit category	Musculoskeletal disorders				Total		p-value
	There are complaints		No complaints		n	%	
	n	%	n	%			
Smoke	25	49	26	51	51	100	1.000
Do not smoke	2	40	3	60	5	100	
Total	27	48.2	29	51.8	56	100	

Source: Primary Data, 2020.

use human power, they do not use the assistance of machines such as fishermen who have large ships. In the use of this tool, there are two stages, namely pulling and lowering it where the activity requires them to adjust to using their equipment which is far from the natural position of someone.

This research is in line with research conducted by Wahab on fishermen in Batukaras Village, Cijulang Pangandaran District. His studies suggest that tenure has a significant association with musculoskeletal disorders. There is a relationship between a work period and low back pain because this disease is a disease that takes a long time to manifest or have an impact, so the longer a person is exposed to risk factors, the greater the likelihood of experiencing low back pain. In this study, workers with a work period of more than 20 years had a 1.2 times greater risk of experiencing low back pain.¹⁰

The smoking habit of fishermen has become a habit that is difficult to stop because of the effects of nicotine contained therein. They feel like something is missing during a short break without smoking a cigarette. Before they go to catch seafood, they have to prepare cigarettes first.

The results obtained from the smoking habit variable in this study did not have a significant relationship with musculoskeletal disorders where the results of the research conducted were not in line with the existing theory, that smoking habit is one of the individual factors that can affect musculoskeletal disorders.

There is no association between smoking and musculoskeletal disorders because most fishermen have a smoking habit but are still productive and rarely have musculoskeletal disorders. There is also a possibility because cigarettes containing nicotine can cause addiction because it can trigger dopamine, which is an element related to feelings of pleasure.¹¹ So it may lead to other health problems for them rather than musculoskeletal disorders later in the years. Other factors that may also affect such as the physical strength of each fisherman are different, the workload is not too big, because fishermen in this study do not have rules that limit their movement space when working.

Conclusion

Age and smoking habit do not have a significant relation between Musculoskeletal Disorders. But working periods have a significant relation with it. Further research is needed on this topic, such as using a medical examination of Musculoskeletal Disorder not only using a questionnaire so that the accuracy of the disease complaints is more accurate.

Conflicts of interest

The authors declare no conflict of interest.

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