The Indonesian Journal of Occupational Safety and Health
2023, 12 (3): 337-348
p ISSN: 2301 8046, e ISSN: 2540 7872
http://doi.org10.20473/ijosh.v12i3.2023.337-348

ORIGINAL ARTICLE

Work Safety Aspects on the Sea on Small-Scale Fishermen in Jember Regency, Indonesia

Reny Indrayani, Ana Islamiyah Syamila, Ragil Ismi Hartanti, Anita Dewi Prahastuti Sujoso
Public Health Study Program, Faculty of Public Health, University of Jember, Jember 68121, Indonesia
Jl. Kalimantan Kampus Bumi Tegal No.I / 93, Krajan Timur, Boto, Sumbersari, Jember, East Java 68121, Indonesia

ABSTRACT

Introduction: The safety aspects of working on the sea which have not been properly implemented by fishermen have resulted in a high fatality rate in the fisheries sector. The dynamic conditions of the south coast sea waves in Jember Regency and the lack of understanding of safety by fishermen have caused several accidents which resulted in work fatalities. The research team viewed that the OSH problems faced by fishing communities need to be studied further. The purpose of this study was to examine the safety aspects of fishing vessels and describe the safety aspects of sailing based on individual characteristics. **Method:** This research is descriptive research with a quantitative approach. Respondents in this study were 260 small-scale fishermen and 24 boats. The research variables are the characteristics of the respondents and sailing safety aspects. **Results:** The safety aspects of fishermen are at an unsafe level with a tendency for unsafe behavior to be carried out by fishermen who have worked for more than 11 years with a working duration of more than 9 hours and most of them come from Puger Beach. **Conclusion:** The characteristics of Puger Beach, which has high waves with strong currents, cause many work accidents, so it needs support from the government to improve the work safety aspects of the fishermen by providing sailing safety training and appropriate PPE.

Keywords: fishing boats, sailing safety, small-scale fishermen, work safety aspects

Corresponding Author:
Ana Islamiyah Syamila
Email: ana.islamiyah@unej.ac.id
Telephone: +6281292227877

INTRODUCTION

Indonesia, which has long been known as a maritime country, has wealth in the form of marine resources. Indonesia has 17,499 islands with a total area of about 7.81 million km2. Among that total area, 3.25 million km2 is ocean, and 2.55 million km2 is the Exclusive Economic Zone. One of the abundant marine resources in Indonesian waters is fisheries and coral reefs. The area of fishing grounds in Indonesia, which is divided into 11 Fishery Management Areas of the Republic of Indonesia, is approximately 5.8 million km2 (Badan Pusat Statistik Indonesia, 2018).

The welfare of the Indonesian people, particularly the fishermen, is the responsibility of the state. Therefore, the Indonesian Government is trying to accelerate sustainable development in the maritime sector (Badan Pusat Statistik Indonesia, 2018). One of the welfare components is the fulfillment of occupational health and safety (OHS), yet these components cannot be achieved optimally. Facts about safety conditions in fishermen can be seen from the results of previous studies.

Research by Putra, Purwangka and Iskander (2017) on fishermen in Pangandaran, for example, found that fishermen's knowledge about OSH was very minimal. One-fifth or 20% of fishermen in Pangandaran had low knowledge of OSH, while the remaining 80% did not know about OSH.

Furthermore, a study conducted by Lucas and Case (2018) stated that the fatality rates in the fisheries sector in 2010-2014 in America reached 21 to 147 deaths in 100,000 working hours. This rate is way higher than fatality rates in other employment sectors. Another research (Myers, Durborow and Kane, 2018) further discovered that the fatality rates in the fisheries sector are 20 times greater than in the mining sector which is known to be dangerous. In Indonesia, this figure is of course expected to

Cite this as: *Indrayani, R., et al.* (2023) '*Work Safety Aspects on the Sea on Small-Scale Fishermen in Jember Regency, Indonesia*', *The Indonesian Journal of Occupational Safety and Health*, 12(3), pp. 337-348.

 doi:10.20473/ijosh.v12i3.2023.337-348. Received November 28, 2022; 1st revision January 11, 2023; 2nd revision August 08, 2023; Accepted August 29, 2023; Published: December 2023. Published by Universitas Airlangga.

be much higher considering that Indonesia is a developing country (a country with lower middle income).

Therefore, health and safety issues in fishermen and the fisheries sector are now a global concern, including in Indonesia (Putra, Purwangka and Iskander, 2017). A study found that the causes of death in the fisheries sector include ship disasters, drowning, disease, and trauma (Myers, Durborow and Kane, 2018). Trauma can be experienced by fishermen, one of which is caused by traditional diving activities (barotrauma).

Jember Regency is one of the regencies in East Java with 170 km long beach area. The water area of Jember Regency which is included in the EEZ reaches 8,338.5 km2 (Bappeda Jatim, 2013). Meanwhile, the number of fishermen in Jember Regency continues to increase, namely 1302 people in 2018 and 2255 people in 2020 (Pemda Kab Jember, 2020). The very dynamic conditions of the south coast sea waves coupled with the lack of understanding of safety by fishermen have caused several accidents that have claimed lives.

One of the accident happened at Puger Beach in 2018, in which a fishing boat accident caused the death of nine people (Kadhafi, 2019). Furthermore, according to the research carried out by Syamila, Suwandi and Wibowo (2017), 38.1% of the fishing community in Sumberejo Village have experienced Decompression Illness, which is included in barotrauma. A large number of incidents of work accidents and occupational diseases in fishermen indicate the low application of work safety on the sea. Fisherman must implement the aspects of work safety in order to reduce the risk of work accidents on the sea. It includes aspects related to shipping safety and sailing safety aspects.

Small-scale fishing is one of the most precarious occupations, with high rates of threats and hazards and they face many safety problems. The lack of safety equipment used and the weak regulations governing the safety of small-scale fishermen have resulted in fishermen working without paying attention to safety aspects. Small-scale fishermen are also not well-educated about work safety aspects.

We conducted a preliminary study and observed how fishermen used boats and interviewed fishermen in carrying out their work. Based on the discussions held with several groups of fishermen, one of the root causes of accidents is the neglect of safety aspects when going out to sea looking for fish, wherein fishermen do not want to use life jackets as a safety device. The reason given by most fishermen is because they did not want to be bothered with life jackets when going out to sea. This attitude stems from the lack of knowledge about the importance of work safety aspects.

Based on the facts and data that have been presented, the research team believes that the OSH problems faced by fishing communities in Jember Regency need to be studied further. The purpose of this study was to examine the safety of small-scale fishermen in the coastal area of Jember Regency, which include aspects of sailing safety.

METHODS

This research is descriptive research with a quantitative approach. The data collected in this study is in the form of primary data on the number of fishermen in Jember Regency, the number of fishing vessels in Jember Regency, and the safety aspects of the fishermen. This research was conducted on beaches scattered throughout Jember Regency, especially areas that have fishermen catching fish. The research was carried out in September 2022 with a sample of 260 small-scale fishermen and 24 boat owners. The variables studied include working period, working duration, work location, and sailing safety aspects.

The data in this study were collected using interview method with the help of research instruments in the form of questionnaires and direct observation. The questionnaire in this study was developed by the research team regarding guidelines for safety at sea for small-scale fishermen (FAO, 2021).

The interview was conducted in person with due observance of the Covid-19 prevention health protocol. In addition, data collection was carried out through direct ship observation following the observation checklist. The questions given are related to ship construction and safety measures in sailing including deck safety, safety rails and ladders, fire safety, lighting, rope and wire handling, stability, and how to survive on the sea.

Total of 42 questions were asked with three scoring answers. Based on the number of scores obtained by respondents and the distribution of categories based on the frequency distribution formula, three categories of assessments were obtained, namely unsafe behavior, moderately safe behavior, and safe behavior.

The resulting data were then frequently distributed and cross-tabulated between variables. In addition, this research has also obtained an ethical license certificate No: 1619/UN25.8/KEPK/DL/2022.

RESULT

Individual Characteristic Factors

The individual characteristics contained in this study included working period, working duration, and work location. Based on the results of the research conducted through interview method using a questionnaire to 260 fishermen in Jember Regency, data related to the distribution of individual

Based on their working period, most of the respondents had worked as fishermen for more than 11 years, namely 183 fishermen (70.4%). Based on their working duration, most of the respondents sailed for equals to or more than nine hours/day, namely 251 fishermen (96.5%). Based on their work location, more than half of the respondents sailed in the Puger area, namely 145 fishermen (55.8%).

Table 1. Individual Characteristic Factors

Individual Characteristic Factors	n	%
Working Period		
≤10 years	77	29.6
>11 years	183	70.4
Working Duration		
<8 hours	9	3.5
≥9 hours	251	96.5
Work Location		
Puger	145	55.8
Payangan	74	28.5
Papuma	41	15.8

Table 2. Frequency Distribution of Sailing Safety Aspects

Sailing Safety Aspects	n	%
Unsafe	159	61.2
Moderately safe	95	36.5
Safe	6	2.3
Total	260	100

Sailing Safety Aspects

Unsafe behavior by fishermen and unsafe conditions while sailing increase the risk of work accidents. In order to find out how the fisherman's behavior is, interviews were conducted related to sailing safety, as well as the safety and health of the crew. Based on the results of research conducted, data related to the distribution of sailing safety aspects were obtained and presented as follows:

Based on the results of research conducted through the interview method using a questionnaire to 260 fishermen in Jember Regency, data related to the distribution of sailing safety aspects were obtained and presented in Table 2. Based on the sailing safety aspect, it is known that 159 fishermen out of 260 respondents (61.2%) in the three coastal areas of Jember Regency behave unsafely while sailing.

Several aspects can be assessed from sailing safety, namely deck safety, safety rails and ladders, fire safety, lighting, rope and wire handling, stability, and how to survive on the sea. The author found several aspects of sailing safety that were not obeyed

Table 3. Frequency Distribution of Unsafe Sailing

Unsafe of Sailing	n	%
Use of Gloves		
Never	133	51.2
Sometimes	66	25.4
Always	61	23.4
Checking the Ladder		
Never	197	75.8
Sometimes	47	18.1
Always	16	6.1
Smoking while Sailing		
Always	252	96.9
Never	8	3.1
The Importance of Discharge Holes (Freeing Ports) on the Ship		
Ignoring the safety aspect	172	66.2
Know quite	29	11.2
Considering the security aspect	59	22.6
Use of Life Jackets		
Never	141	54.2
Sometimes	89	34.2
Always	30	11.5

by fishermen according to the aspects assessed in the questionnaire. The results of this study are presented in Table 3.

Sailing Safety Aspects based on Individual Characteristics

The results of the cross-tabulation between the individual characteristics of the respondents (working period, working duration, and work location) and sailing safety can be seen in Table 4.

Based on their working period, among 159 respondents (61.6%) who behaved unsafely while sailing, 98 of them had a working period of more than 11 years. Based on the duration of work, among 159 who behaved unsafely while sailing, 155 of them (97.5%) had a working duration of equals to or more than nine hours. Based on their work location, among 159 respondents who behaved unsafely while sailing, 84 of them (52.8%) sailed in the Puger coastal area.

DISCUSSION

Individual Characteristic Factors

A person's working period can be calculated from the first time they work until research is carried out. The results obtained in this research is in line with previous research by Marasut (2022) that most fishermen in Essang District, Talaud Islands Regency, have worked for more than 10 years, which is 26 people (86.6%). The longer the working period, the higher the workability one has, and the more efficiently the body and soul work, so that the burden is relatively small.

Table 4. Cross-tabulation of Individual Characteristics and Sailing Safety Factors

Individual Characteristic Factors	Sailing Safety Aspects		
	Unsafe	Moderately Safe	Safe
Working Period			
≤10 years	61 (38.4%)	16 (16.8%)	-
>11 years	98 (61.6%)	79 (83.2%)	6 (100%)
Working Duration			
<8 hours	4 (2.5%)	4 (4.2%)	1 (16.7%)
≥9 hours	155 (97.5%)	91 (95.8%)	5 (83.3%)
Work Location			
Puger	84 (52.8%)	58 (61.1%)	3 (50%)
Payangan	47 (29.6%)	24 (25.3%)	3 (50%)
Papuma	28 (17.6%)	13 (13.7%)	-

Working period can have a positive or negative influence. The longer the working period, the more experience a person has in doing his work and creating a habit of behavior (Rahmawati et al., 2022). Increased experience can create good work productivity, where fishermen can master and develop ways to maintain safety while on the sea. However, a long working period can also have a negative effect where work that is carried out continuously will cause boredom, work carelessly, and decreased health and physical abilities affecting the safety of fishermen while sailing (Hardiyanti, 2020).

Furthermore, working duration is the number of working hours offered by the workforce using units of working hours per day or total working hours per week. Based on the Government Regulation Number 35 of 2021, the provisions for working hours have been regulated in two systems, namely seven working hours/day or 40 hours/week for six working days in a week, and eight working hours/day or 40 working hours/week for five working days in a week. The duration of working hours for fishermen is determined by the length of fishing operations, which ranges from 15.00 – 07.00 WIB. Therefore, this study used two categories of working hours, which is more than eight hours and equals to and more than nine hours per day. Based on the duration of their work, most respondents sailed for equals to or more than nine hours/day, namely 251 fishermen (96.5%). This condition is in line with the previous research (Linda. Manama and Khosama, 2019) that revealed the average fishermen in the coastal area of Manado Beach in Maasing had a high working duration of more than 8 hours per day.

The working duration of fishermen in Puger and Payangan is relatively long because most respondents said they set sail from the afternoon of around 15.00 to 07.00 in the morning. However, it is different from fishermen from Papuma who claimed to sail from seven in the morning to around two in the afternoon. The duration of the fisherman's journey is calculated from the time they leave until they reach the target fishing spot, then wait for the catch, until they return to the mainland. Based on the results of interviews, the duration of time they

work is strongly influenced by the catch. If the catch of fish is sufficient, they may return to the mainland early in the morning. However, if the fish they get are lacking, they will continue to look for the ideal place to cast nets. The longer they search, the longer the working duration, and they can even stay at sea with supplies.

The longer fishermen are at sea, the more vulnerable they are to experience danger. Uncertain waves and weather conditions can cause the ship to shake and even sink. In addition, the visibility while diving will also be disrupted when the weather conditions are bad. Furthermore, exposure to sunlight can cause sunburn. According to National Institute for Health and Care Excellence (NICE) (2016), the time between 10 a.m. and 3 p.m. is when the sun's UV rays are highest. Although such condition is also good for helping the absorption of vitamin D, but other conditions can have many impacts, namely forming redness on the skin, causing sunburn, and causing erythema due to UV B rays. Other effects are triggers for cataracts, raises risk of cancer, and reduces skin elasticity.

The risk of cold temperatures can also affect the health of fishermen who are diving and lifting ice. In addition, the biological hazard itself can be felt by fishermen who dive and are tasked with herding fish. Some of the marine biotas that are quite dangerous in the ocean are sharks, barracuda fish, jellyfish, sea urchins, sea snakes, and sea anemones. Based on interview results, several fishermen admitted that they were often stung by jellyfish which cause them to feel itchy and experience skin redness. Furthermore, fishing activities are also often carried out ergonomically. Repetitive and long-term activities that use the upper extremities, neck, and back can cause Cumulative Trauma Disorders (CTD), so muscle fatigue often occurs (Vinezzia, 2021).

In this study, there were three selected work locations for fishermen in Jember Regency, namely Puger, Payangan, and Papuma. Based on their work location, more than half of the respondents sailed in the Puger area, namely 145 fishermen (55.8%). Most boats owned by Puger fishermen are larger than those owned by Payangan and Papuma fishermen. Based on the results of interviews, the construction of this ship is under the skipper's finances as well as an anticipation of the big waves that will be encountered when sailing. Puger is one of the locations in the south coast which has dynamic natural conditions and quite high sea waves. This location is directly facing the Indian Ocean which causes the high waves and fast currents, the reason why Puger beach tends to have high waves (Luthfi and Wibisono, 2018).

The traditional shipbuilders in Puger only modify the previous ship designs based on skills obtained from their predecessors so the sailing safety of these fishing boats is still questionable (Puspita and Utama, 2017). The fishermen usually operate these ships on territorial waters range that are not too far away as well as catches that are not as big as modern fishing boats. The majority of Puger fishermen explained that the Plawangan route is prone to ship accidents where many ships overturned and sank, resulting in many fishermen being killed. They explained that the boat was just turning around in the middle while waiting for the waves at Plawangan to be small. Even when they bring their caught fish to land, they can be stuck in this route for hours because they cannot get out from Plawangan, which is known to be quite ferocious.

Based on the results of the study, compared to Puger fishermen, fewer fishermen in Payangan and Papuma experienced capsized boats. This might happen because there are no deadly routes such as Plawangan area with high waves reaching two meters taken by Payangan and Puger fishermen. However, if you look at the many reports of capsized boats and the deaths of fishermen in Jember, all ocean waves are dangerous. The fishermen cannot prevent big waves from hitting the ship, but they can find out what efforts can be made when the boat capsizes, such as being alerted to wearing a life jacket, taking the right breathing pattern while swimming, and trying to stay in groups when swimming in the middle of the sea. In addition, it is important to repair and complete safety equipment on the boat as a preparedness effort when a ship accident occurs.

Sailing Safety Aspects

Occupational safety and health for fishermen specifically aims to prevent or reduce accidents and their consequences, secure boats, and work equipment, and protect the products they catch. In order to support the achievement of these goals, fishermen's knowledge and commitment are needed regarding the use of work safety equipment for ship crew according to national and international standards, so that it must be used when working (Hendrawan, 2017). The series of sea activities consists of nine stages, namely preparation on land,

loading onto the boat, sailing to the fishing area, preparation of fishing gear, operation of fishing gear, lifting the fishing gear (hauling), handling the catch, sailing to the fishing base, and unloading catches and fishing gear (Vinezzia, 2021).

In each series of activities, there are always various risks to occupational safety and health hazards to fishermen. Fishing activities on the sea have a high risk because ships operate from calm waters to waters with very big waves. Fishing vessel safety is a complex interaction of factors between human factors (skippers and crew members), machines (ships and safety equipment), and environmental factors (weather and fishery resource management schemes) (Rinaldi, 2018). From these three factors, it can be concluded that safety problems or work accidents will arise if one element of the human, machines, or environmental factors is not functioning.

Based on the sailing safety aspects, it is known that most respondents in the three coastal areas of Jember Regency behave unsafely while sailing. From the interview results, there are several causes of unsafe sailing safety such as the fishermen did not use gloves and did not check the ladder, all respondents smoked while sailing on the deck, no discharge holes (freeing ports) on the ship, and fishermen rarely used life jackets when the boat capsizes.

Most Respondents did not Use Gloves

One of the work equipment that must be used by fishermen is gloves. The gloves used by fishermen can be made of rubber, thick cloth, or plastic. The function of hand protection in the form of gloves is to protect the hands and fingers from heat, water, cold temperatures, chemicals, impacts, blows and scratches, as well as infection from pathogenic substances (viruses, bacteria), fungi, and micro-organisms (Aisyah, 2020). Gloves help fishermen to avoid accidents and occupational diseases. Based on the interview results, most respondents did not use gloves when pulling the rope. They prefer to do it without safety gloves because they are used to it and it is easier for them to pull the ship's rope. Usually, gloves are only used when handling the caught fish because it is slippery. The provision of gloves depends on each fisherman, meaning that the boat owner does not provide special gloves for his crew.

This result is in line with the results of the previous research (Roestijawati et al., 2017) that only 15% of fishermen used PPE in the form of gloves. Gloves should be used during the fishing process and when holding the rope. When fishermen do not use gloves while working, they can experience bleeding blisters and contact dermatitis. Contact dermatitis in fishermen is caused by seawater because the density of seawater can draw water from the skin. Sea water is one of the causes of chronic skin dermatitis with primary stimulating properties (Wibisono, Kawatu and Kolibu, 2018). Therefore, it is important for fishermen to always use gloves while working, not only when handling fish, but during the fishing process and even holding the rope.

Most Respondents did not Check the Ladder Before Using it

Ladder is one of the ship's equipment. The ladder on the ship has several types according to its position, namely inclined ladder and vertical ladder. In general, the ship has ladders both on the outside for the crew to go in and out, as well as on the interior for activities on several floors inside the ship. There are ship ladders that are permanently installed with handrails and there are ladders that are not fixed so they can be moved (Kementerian Pendidikan dan Kebudayaan Republik Indonesia, 2015). Therefore, ladders need to be inspected periodically because they are often used as access and footholds for fishermen.

Based on the research results, it is known that fishing boats rarely have ladders. Stairs are only found on large ships and are used as a foothold for the captain to enter the wheelhouse. The stairs themselves are designed to blend with the deck. When the ladder starts to look a bit porous, it will be replaced. Artificial ladders are also sometimes used by fishermen to climb onto large boats made of wood. The stairs are not made in the form of a footing but only use large tree trunks. This wood is sometimes cleaned because it is slippery due to too much exposure to seawater. Therefore, fishermen have to be careful when stepping on this wood, so they do not slip.

All respondents Smoked while Sailing on the Deck

Smoking is a habit of the respondents while sailing. Fishermen are required to stay awake all night so they will eat, drink, and smoke to

relieve their sleepiness (Anindita, Kiswaluyo and Handayani , 2018). This is in line with the results of the interview that the average respondent sailed for more than eight hours/day, in addition to that they had to be on guard while on the ship, so they chose to smoke to avoid sleepiness. The nicotine content in cigarettes causes smokers to experience insomnia if they smoke regularly before bedtime (P2PTM, 2018).

In addition, the respondents dared to smoke on board because it was far from the reach of fire sources such as stoves. Most respondents admitted that they did not take a stove with them when sailing if it was only for one night, so it was enough to bring provisions. The stove is only carried when sailing for a long period, such as more than one week. However, only fishermen with big boats that usually bring stoves because of the limited space and deck area on small boats. In addition, small ships are prone to accidents at sea due to waves because of their small size, so it is not recommended to go to sea farther, which takes weeks.

There are no discharge holes (freeing ports) on the ship

Ship stability is the balance of the ship based on the cross and longitudinal cross sections. Ship is considered balanced if the ship looks upright, does not tilt to the left or right, looks parallel to the waterline, or the part that sinks in the water, and the front and rear are the same (Kementerian Pendidikan dan Kebudayaan Republik Indonesia, 2015). One of the ways to maintain the stability of the ship is by ensuring smooth drain holes (freeing ports). The main purpose of making drain holes in the ship is so that seawater that enters the deck during bad weather can flow out quickly so that the stability of the ship is maintained (FAO, 2021). However, most ships in this research do not have a sinkhole.

When seawater enters the boat, the fishermen will work together to remove the water using a bucket. So, a bucket is provided onboards for containers of seawater that enter and are then discharged back into the sea. This happens because most respondents do not know the importance of sinkholes to maintain the ship stability. Therefore, they considered it enough to only provide a bucket to collect seawater and there is no need to make a sinkhole. Ship construction has always been designed not to use a sinkhole. On a small boat with a height of about 300 cm, seawater can enter the ship easily, so fishermen need to be responsive in disposing of seawater using a bucket.

When the Boat Capsized, the Fishermen Rarely use Life Jackets

One of the personal safety equipment that fishermen must use is a life jacket. The life jacket functions to protect fishermen who work on the water or the water surface, so they can avoid the danger of drowning (Wulandari, 2021). Based on the interview results, most fishermen did not use life jackets when sailing. Jackets are only used during the fishing process so that when the boat is capsized due to waves or is overloaded, while fishermen are not using life jackets, the risk of sinking is greater.

When the boat is capsized, the fishermen also swim apart and look for each other's safety. For example, if there is a floating object, they will climb to survive and then ask for help from other friends. Several ways were used by the respondents to ask for help such as shouting or raising and lowering their hands repeatedly. The goal is to get the attention of rescuers. The savior referred to by the respondent is a fellow fisherman who sails nearby, because, while working, several other ships will be in the same area to catch fish. Later, if other shipmates cannot help, they will go ashore and ask for help from other fishermen or notify the SAR Team if they cannot be saved.

From the results of the interviews, some respondents claimed to have private boats, and some worked as crew members on other people's ships (ship owners). Not only fishermen, the importance of awareness and knowledge from ship captains also affects the security and safety of their crew. It was stated previously Yoseph (2020) that incomplete sailing safety facilities can be caused by several factors. The first factor is the low level of education and skills of the ship owners or captains' that further results in low awareness of the importance of safety equipment on motorboats. The second factor is the price of safety equipment which is relatively expensive, so not all ship owners/skippers can afford it, especially for life jackets. The last factor is that each ship owner has different priority safety equipment, so not all safety equipment needs to be met.

Sailing Safety Aspects based on Individual Characteristics

Cross Tabulation of Working Period with Sailing Safety

A person's safety while working as a fisherman is determined by his experience in sailing. One's experience at work can be seen from his working period. Working period is the length of time a person works within the scope of work calculated in units of months or years. If the working period is longer, it can produce better work productivity, which can be done by understanding and developing thought in working. According to the previous research (Elmayanti, Nuddin and Majid, 2019), long working period also indicates a high experience, so they can prevent or overcome accidents while working. In this study, the fishermen's working period is divided into two categories, namely less than 10 years (new service period) and more than or equals to 11 years (long service period). Workers who have a long working period will have a positive influence on their work because they have more skills than those with shorter working period (Adinugroho, Kurniawan and Wahyuni, 2014).

The working period of the fishermen in Puger, Payangan, and Papuma is included in the long working period because some of the fishermen stated that they have been fishermen since they were small or when they were in elementary school. This is in line with the results of previous research (Hidayat, 2017) that the working period of fishermen in Kembang, Talango District, have a working period of more than 10 years. In addition, similar results were also obtained (Terok, Doda and Adam, 2020) revealing that the majority of fishermen groups in Tambala village have a working period of more than 25 years.

Based on the results of this study, fishermen who have a longer working period tend not to pay attention to the safety aspects of sailing. In addition, long working period can also have a negative effect, where work that is carried out continuously will cause boredom, being careless while working, and decreased health and physical abilities, thus affecting the safety of fishermen while sailing (Hardiyanti, 2020). Furthermore, according to the results of another study (Asumeng and Folitse, 2019), the long working period of the majority of fishermen is a contributing factor to accidents due to a lack of equipment and other facilities and an excess of catches on board.

Before being used to sail, the condition of the ship needs attention to minimize the risk of work accidents. Some of the causes of accidents while sailing are the lack of maintenance of the ship, the bad condition of the ship, and inadequate and inappropriate tools and equipment (Rahmawati et al., 2022). This can happen because of the habits of the fishermen, the majority of whom have a longer working period and tend to behave according to the conditions.

Based on the results of observations, many ships in the three coastal areas of Jember Regency have unsafe conditions and are at risk of accidents because the ships used do not have free ports. The provision of drain holes on the ship allows the seawater that enters the deck during the bead weather can flow out quickly so that the ship has an even balance. However, no such boats were found in the three coastal areas of Jember Regency. The fishermen had to take out and dispose of the seawater that was on the decks using buckets. This is not in line with the Regulation of the Minister of Transportation of the Republic of Indonesia Number 39 of 2016 concerning Ship Loading and Loading Lines, in article 20 which states that every ship must have freeing ports to free the deck water quickly (Permenhub, 2016).

Cross-Tabulation of Working Duration with Sailing Safety

Sailing safety is an important thing that must be known by fishermen while working on the ship. In supporting safety, several aspects must certainly be met by fishermen in carrying out work. Every aspect of supporting sailing safety must be obeyed by fishermen so that when doing work, they avoid injuries or work accidents. In order to be able to carry out all aspects of supporting sailing safety, of course, extra focus and accuracy are needed. Therefore, one of the important things that can affect the focus and accuracy of fishermen in carrying out aspects of sailing safety is the work duration. Based on research conducted by Thorvaldsen et al. (2020), a job challenge that can create negative conditions at work is the working duration. Long working duration can cause pressure on workers so that it can disturb their focus on what they are doing. Reduced focus on work can be fatal and threaten sailing safety while working on a ship. In addition, working with

a long duration will increase the risk of accidents or injuries at work for fishermen (Lambek, 2022).

Based on the results of the study, fishermen who have a longer working duration tend not to pay attention to the safety aspects of sailing. The working duration of the fishermen in the Puger, Papuma, and Payangan areas is classified as high because the average working duration of the fishermen in these areas is more than 12 hours per day to catch fish in the middle of the sea. This condition is in line with the previous research (Amar, 2021) that also states that the working hours of fishermen in the Saugi Island area of Pangkep Regency start from 05.00 – 17.00 or for 12 hours per day.

Based on the information from fishermen in the Puger, Papuma, and Payangan areas, fishermen have a long working duration because they are always moving from one place to another place to find fish in the middle of the sea, so it takes a long time to work. In addition, several fishermen stated that their working hours depended on the catch of fish. If the catch was deemed insufficient, they would continue to look elsewhere so that their working duration would be longer. This condition is in line Amar (2021) statement that fishermen will increase their working duration in order to increase their catches.

The long working duration of the fishermen in Puger, Papuma, and Payangan areas can be one of the reasons some fishermen ignore safety aspects in sailing. The long duration of work for fishermen can cause them to experience work fatigue. Work fatigue is a condition of decreased alertness and feelings of fatigue in workers which can be caused by the work climate, responsibilities, and working duration (Hendrawan et al., 2019). The occurrence of work fatigue due to the long working duration can increase the occurrence of work errors. Based on the information from several fishermen, they stated that when their physical condition started to get tired, some of them ignored aspects that supported sailing safety.

One example of neglected sailing safety aspects is the use of gloves when fishing. The process of lifting nets which requires time and effort makes some fishermen ignore the use of gloves because they are considered impractical and a waste of time. Gloves have the function to protect the fishermen's hands and fingers from heat, water, cold temperatures, chemicals, impacts, blows, and the risk of being scratched by sharp objects due to the work environment and fish catches. Fishermen who are negligent in using gloves due to work fatigue when fishing can increase the risk of work accidents. This is in line with the research carried out by Sujarwadi (2021) that claimed one of the things that influence the occurrence of work accidents is the compliance of fishermen in using Personal Protective Equipment (PPE) due to work fatigue.

Based on the information from the fishermen, apart from negligence in using personal protective equipment in the form of gloves, most of them also neglected the maintenance of sailing equipment such as ladders on boats. Ladder equipment on ships is rarely maintained or cleaned. This happens because most fishermen did not have free time to carry out maintenance during the sailing season. After working for more than nine hours, they will immediately rest at their house. On average, they only have less than eight hours of resting per day. After that, they will return to sail at the hour determined by the ship owner so that ladder maintenance is rarely done daily. Maintenance will only be carried out when the weather is bad because most of them do not sail and have free time. According to FAO (2021), ladders used by fishermen on boats must always be checked and maintained to ensure that the ladders are in optimal condition and fit for use. Most fishermen use ladders made of wood so that when exposed to water it causes the stairs to become slippery and increases the risk of accidents and threatens the sailing safety of fishermen.

Cross-Tabulation of Working Location with Sailing Safety

Based on the results of the analysis, most of the fishermen in terms of sailing safety were identified as unsafe in the various locations studied. The safety of sailing fishermen in Jember Regency can also be affected by the location occupied by fishermen every day. This study used three sample locations which are areas where most people work as fishermen, including Puger, Payangan, and Papuma areas. The location or area that has the highest frequency of unsafe fishermen's safety is the Puger area. This can be influenced by various factors, one of which is many fishermen in Puger compared to the other two locations.

This research is in line with the research conducted by Ulfah (2021), that in developing countries such as Southeast Asia there are still fishermen who use simple, very limited, and inadequate equipment, in contrast to developed countries that already use modern equipment. This can influence and support the potential hazard

that can occur if fishermen work outside of the established OSH procedures. Sailing safety for fishermen is very important and becomes a priority for fishermen while working. Neglecting shipping safety tends to cause unwanted incidents and even accidents and increase economic and environmental costs such as decreased production, medical costs, and pollution (Nurhayati et al., 2022). Many factors can cause ship accidents during sailing, such as uncertain sea conditions, as well as the fishermen's energy and skills in dealing with these situations (Kadhafi, 2019).

Puger which is one of the locations on the south coast has dynamic natural conditions and quite high sea waves. This location is directly facing the Indian Ocean which will have an impact on high waves and fast currents in these waters (Luthfi and Wibisono, 2018). Various boat accidents have occurred frequently to fishermen in recent years. In June and July 2018, four boat accidents killed a fisherman, and incidents of overturning fishing boats on July 19, 2017, caused the deaths of six fishermen and four missing fishermen (Utami, 2020).

In general, ship accidents that occur in Plawangan Puger result in the ship capsizing because the ship's position is not perpendicular to the direction of the waves. Fishermen who drive boats in bad weather conditions or high waves require skill and precision. The alignment between the speed of the ship and the tempo of the waves must be considered carefully and the captain must always orient the ship perpendicular to the direction of the incoming waves. When the ship starts to turn and then the waves hit from the side, the ship immediately loses balance and then capsizes (Kadhafi, 2019). Therefore, it is important for fishermen to always maintain safety while sailing such as by wearing life jackets while sailing, providing ring bouys on the sea, always maintaining deck security, and so on. These ways can reduce the risk of accidents due to unsafe conditions on the ship while sailing.

CONCLUSION

Most fishermen have worked for more than 11 years with a working duration of more than nine hours per day and most of them come from Puger Beach. The safety aspect of sailing fishermen is at an unsafe level with the tendency for unsafe behavior to be carried out by fishermen who have worked for more than 11 years with a working duration of more than nine hours and most of them are from Puger Beach. The characteristics of Puger Beach, which has high waves with fast currents cause many work accidents, so it needs support from the government to improve fishermen's sailing safety aspects by providing sailing safety training and providing appropriate PPE.

ACKNOWLEDGMENTS

This research was financially supported by an Internal Grant, Institute for Research and Community Service, University of Jember

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