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Research Article

Aspects of Personal Safety while Sailing for Fishermen in Jember Regency

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ABSTRACT

Fishermen have an important role in supporting the Indonesian economy. On the other hand, fishing was the most dangerous job in the world with a very high risk of accidents and death. Therefore, it was necessary to study the safety aspects of fishermen as a basis for formulating protection policies for fishermen. This study aimed to examine aspects of personal safety when sailing for fishermen in Jember Regency. This research was a descriptive research. The research was conducted in Jember Regency in August-October 2022 involving 260 fishermen as respondents. Research data collected through interviews. Data were analyzed and presented using tables and cross-tabulations accompanied by narration. The results of this study indicated that there is a tendency that the older the respondents were, the more they pay attention to aspects of personal safety while sailing and the higher the education level of the respondents, the higher the awareness of personal safety while sailing. The government needs to work on improving personal safety aspects for fishermen, especially in terms of providing and using PPE.

***Keywords:** Accidents, fishermen, occupational safety and health, personal safety*

INTRODUCTION

Indonesia is the largest archipelagic country in the world, consisting of five main islands and around 30 small islands, with a total of around 18,110 islands and small islands (Kementerian Luar Negeri, 2018). The length of Indonesia's coastline reaches 95,181 km which is the second longest coastline in the world. The area of Indonesian sea waters reaches 5.8 million km2 which is 71% of the total area of Indonesia. This fact makes marine wealth a life support for Indonesia (KKP RI, 2019). Capture fisheries production in Indonesia continues to increase, from 6.6 million tons in 2016, to 6.8 tons in 2017, and increased again to 7.2 tons in 2018 (Suhufan et al., 2022). Fishery production inseparable from fishing activities. Up to now, fishing activities in Indonesia are still dominated by small fishermen (KKP RI, 2020).

Fishermen have a very important role for the Indonesian economy. On the other hand, fishing is one of the jobs with the highest accident risk in the world. The International Labor Organization (ILO) and the Food and Agriculture Organization (FAO) estimate that worldwide, there are 24,000 to 32,000 deaths in fishermen fishing each year (FAO, 2021b). A study in Mexico

even said that job fatality rates in the fisheries sector when compared to the mining sector were up to 20 times higher (Myers et al., 2018). The accidents for fishermen when fishing can be caused by various factors including technical factors and human factors (FAO, 2021b). In the study of safety at sea, the human factor is included in the aspect of personal safety which includes the factors of human error, lack of experience, use of personal protective equipment (PPE), adherence to procedures, and et cetera (FAO, 2021a).

East Java Province is a province with sea area nearly four times that of its land area. The length of the East Java coastline reaches 3,498.12 km2 with a sea area of 126,672 km2. This makes East Java rich in fish resources, as evidenced by the data which states that East Java is the province with the largest fishery GRDP value in Indonesia. The GRDP value is dominated by small-scale capture fisheries businesses by fishermen (BPS Jatim, 2020). Jember, as one of the regencies in East Java, has the 5th largest number of people who work as fishermen with a total of 17,393 fishermen (Dinas Perikanan dan Kelautan Provinsi Jawa Timur, 2015 dalam Damayanti, 2022). Therefore, as a contributor to GRDP in East Java fisheries, the safety aspects of fishermen must be the concern of the local government. Ironically, fishing accidents while sailing are still common. Throughout 2021, in the Puger District, Jember Regency alone, there have been 7 accidents with 1 death and another being injured (Radar Jember, 2021). The safety of fishers when sailing can be improved by establishing appropriate policies based on an analysis of the situation of the personal safety aspects of small fishermen. Therefore, based on all of these descriptions, it is necessary to study the aspects of personal safety for fishermen, especially in Jember Regency. The purpose of this study was to examine aspects of personal safety when sailing for fishermen fishing in Jember Regency, especially based on the respondent's characteristic factors (such as age and level of education).

MATERIAL AND METHODS

This research is a descriptive study that describes the aspects of personal safety when sailing for fishermen in Jember Regency based on individual characteristic factors including age and level of education. The research was conducted in the coastal area of Jember Regency which had the highest number of fishermen, namely Puger Beach, Papuma Beach and Payangan. The research was conducted from August to October 2022. The population for this research is fishermen, totaling 12,366 people (Central Bureau of Statistics for Jember Regency, 2020). The research sample was determined using the Lameshow formula so that a total sample of 260 fishermen was found. Research data were collected through interviews using an interview instrument (questionnaire) consisting of 41 questions divided into 4 groups of sub-variables. The four groups of sub-variables include: Ship crew behavior while sailing (22 questions), use of PPE (11 questions), use of equipment (5 questions), and occupational health (3 questions). This questionnaire was developed from the Safety at Sea Guidelines for Small-Scale Fishers (FAO, 2021b). The collected data were then analyzed descriptively and presented in the form of frequency distribution tables and cross-tabulations accompanied by narration.

RESULTS AND DISCUSSION

Characteristics of the Respondents

The characteristics of the respondents in this study include age and level of education. Based on the structured interview using a questionnaire to 260 fishermen in Jember Regency, the respondents characteristics presented in table 1. Age categories are divided into young people with a range of 15-24 years, early workers 25-34 years, aged workers 35-44 years, pre-retired 45-54

years, retired 55-64 years, and elderly 65-74 years (ILO, 2020). Education level categories are divided into 4, namely no school, elementary school, junior high school, and high school.

Table 1. Frequency Distribution of Respondent Characteristics

Respondent Characteristics	n	%
Age		
Young	31	11,9
Early worker	63	24,2
Middle-aged	77	29,6
Pre retirement	56	21,5
Retired	22	8,5
Elderly	11	4,2
Level of education		
Illiterate	12	4,6
Elementary school	125	48,1
Junior high school	69	26,5
Senior high school	54	20,8
Total	**260**	**100,0**

Table 1 shows that based on age, most respondents are in the middle-aged category (29.6%). The youngest respondent in this study was 17 years old and the oldest was 73 years old. Age is one of the factors that affect occupational safety and health. The older the worker, the higher the level of experience so that it is expected to be more qualified in thinking and working. In terms of trust, someone who is older can be trusted than someone who is not yet mature enough. This happens because there is evidence of experience and maturity of the soul (Hendrawan *et al*., 2020:29). However, increasing age will also affect a person's level of fatigue due to work activities. Older people are more likely to have work accidents than young people, because the speed and responsiveness of young people is better. The closer to old age, the more unproductive a person is and tends to be careless in completing his work (Rahmawati *et al*., 2022:307). Based on the results of the interviews, these fishermen do a lot of lifting and carrying activities, so they rely more on muscle strength. However, as you get older, your muscles decrease. Generally, the average strength decreases to 20% by the time the age reaches 60 years and over (Mondigir *et al*., 2017:2). Therefore, the intensity of the activity and the increasing age will greatly affect the level of fishermen's fatigue, so that the level of safety during sailing will also decrease.

Based on table 1, it is known that the most recent educational level or graduates of respondents were elementary schools (48.1%). This is in line with the results of the study Zebua *et al*. (2016:93) that the human resources of traditional fishermen on the coast of Sri Mersing Beach, Kuala Lama Village, Serdang Bedagai, North Sumatra in general are still very low, namely not having finished elementary school and having the highest educational history is a high school graduate. Low education will affect the level of knowledge of fishermen regarding safe work procedures while sailing. The lower the level of education, the lower the implementation of occupational safety and health on ships.

Low education will determine the amount of one's knowledge, where people with low education will have difficulty accepting new things and access to information tends to be difficult to obtain. For a worker, the level of education will affect the pattern or way of thinking at work as well as the level of information absorption when given some kind of training related to safe work procedures and efforts to achieve occupational safety and health (Rahmawati *et al*., 2022:307). Fishermen in Puger, Papuma, and Payangan rely more on hereditary experience and have never received OSH counseling or training, so there are still many boat safety fittings that are not fulfilled.

Even though buoys were once provided free of charge through the Jember Regent's program, they are still rarely used by fishermen when out at sea. This is most likely caused by a lack of awareness and knowledge of fishermen on the importance of PPE. Therefore, the provision of PPE needs to be balanced with counseling and training on the importance of using PPE so that it can increase compliance with the use of PPE and can better understand safety issues and marine fisheries technology and can complement PPE while sailing (Nurhayati Efendi et al., 2022; Sahuri & Sahna, 2021). In realizing this, there needs to be synergy between the government and various parties (including academics) in order to increase fishermen's compliance in using PPE and improve personal safety while sailing.

Personal Safety Aspect

The personal safety aspect is assessed based on 4 sub-variables namely ship crew behavior while sailing, use of PPE, use of equipment, and occupational health. The categories of personal safety aspects are divided into 3 (not safe, moderately safe, and safe)). Based on the structured interview using a questionnaire to 260 fishermen in Jember Regency, data on aspects of personal safety were obtained as presented in table 2

Table 2. Frequency Distribution of Personal Safety Aspects while Sailing among Fishermen

Personal Safety Aspects	n	%
Personal Safety (Total)		
Not safe	46	17,7
Moderately safe	198	76,2
Safe	16	6,2
Ship Crew Behavior while Sailing		
Not safe	7	2,7
Moderately safe	223	85,8
Safe	30	11,5
Use of PPE		
Inadequate	33	12,7
Moderately adequate	226	86,9
Adequate	1	0,4
Use of Equipment		
Not safe	2	0,8
Moderately safe	253	97,3
Safe	5	1,9
Occupational Health		
Inadequate	7	2,7
Moderately adequate	111	42,7
Adequate	142	54,6
Total	**260**	**100,0**

Table 2 shows that from the perspective of personal safety while sailing, most of the respondents behaved quite safely. This is indicated by a percentage of 76.2%. This percentage is quite far from the other categories, namely unsafe behavior of 17.7% and safe behavior of only 6.2%. When viewed further, from table 2 it is known that among the four sub-variables, the use of PPE is the aspect of personal safety that is the least important, and occupational health is the aspect of personal safety that has the highest level compared to the other sub-variables. In the variable use of PPE, it is known that 12.7% of respondents are inadequate in using PPE, and only 0.4% of respondents use PPE adequately. The most inadequate use of PPE by respondents included: not

wearing long sleeves, boots and gloves when heading to the ice storage room, not using a life jacket while working, and not wearing safety glasses.

Personal protective equipment such as long sleeves, boots, gloves are very important for fishermen. The use of personal protective equipment by wearing long sleeves, boots and gloves can minimize work accidents. Working at sea has a higher risk than work on land (Amar, 2021). Based on the results of interviews with fishermen, the majority only had makeshift equipment while sailing, such as wearing long-sleeved shirts and jackets, wearing hats, not using sandals or shoes when sailing, using Styrofoam boxes as fish storage, fish storage would be moved into the hold. if the Styrofoam box is full of fish and when placing fish all fishermen do not use gloves. This is motivated by the benefits felt by fishermen, that hats can be used to protect the face from the hot sun. Likewise with long-sleeved shirts or jackets that function to protect the body from exposure to the sun's heat (Amar, 2021).

The fishermen also pay attention to the selection of clothing materials used, such as choosing materials that are flexible when moving and easy to swim when they fell into the water. However, fishermen are not aware of the use of shoes and gloves, possibly because they have not fully experienced the effects of using these two personal protective equipment. In addition, fishermen choose not to use shoes and footwear because they are considered to only interfere with the work movements of fishermen and to make it easier to accelerate work. As for gloves, their use is considered to make it complicated when working. According to (Rosane A.F. Domino (2017) at (Amar, 2021)) stated that the rate of work accidents in fishermen, which reached 19.6%, made it important for inspection activities and a work culture regarding the use of proper prevention equipment for fishermen, which greatly encouraged the success of fishermen at sea.

A life jacket is a personal protective equipment used to save the lives of workers when they fall into the sea. The use of life jackets is the most important thing for fishermen, especially those who work for days at sea. The function of the life jacket is to guarantee the safety of fishermen when an accident occurs at sea, compared to other objects that can be used as aids to float in the water when the ship sinks or capsizes. However, fishermen often ignore life jackets when working because of low awareness of fishermen regarding the use of personal protective equipment. Based on the results of interviews with fishermen that the majority of fishermen do not carry life jackets while working and when they fall into the sea or drown, they tend to look for objects floating in the sea to use to support their bodies and survive. Even though all the fishermen had been given life jackets by the government but they were not used properly, several fishermen admitted that the life jackets had never been worn and had been left at home while working. Some fishermen also think that accidents at work are a consequence of sailing. In addition, fishermen tend to prefer personal protective equipment that is comfortable to use to support safety when at sea. According to research (Fauziningrum *et al*., 2022:620) it is necessary to have personal protective equipment such as a life jacket that is used when in a dangerous situation while working. Each crew member must have an equal number of life jackets between the crew and life jackets.

Safety glasses are one of the personal protective equipment used to protect the eyes from danger or exposure to particles floating in the air and in bodies of water, splashes of small objects, heat or hot steam and sharp objects (Ulfah, 2021, p. 45). In this study, based on the results of interviews with fishermen, they chose not to use goggles when operating the hook because they were used to it and felt safe while sailing. In addition, some fishermen stated that if wearing glasses was seen as only disturbing their comfort while working, they were not free to work. According to research Rakhmawati et al., (2022) as many as 75.5% of respondents experienced work accidents

by carrying out unsafe actions. So that the unsafe behavior of these fishermen greatly influences the occurrence of work accidents. This is mostly caused by not using personal protective equipment (PPE), not putting the equipment back in the box, operating the boat at an unsafe speed, not checking the condition and suitability of the ship before sailing and not maintaining work machinery and equipment (Rakhmawati *et al.*, 2022:307).

Personal Safety Aspects based on Respondents' Characteristics

The occupational safety of fishermen is very important and occupies a central position in all aspects of the world of capture fisheries (Hendrawan, 2020:26). Fishing on the high seas is recognized as one of the most dangerous jobs, with increased mortality, morbidity, fatal work accidents and injuries, compared to land-based fisheries (Rahmawati *et al.*, 2022:302). Assessment of fishermen's personal safety aspects while sailing based on individual characteristics was carried out through cross tabulation between personal safety aspects and age (table 3) and cross tabulation between personal safety aspects and education level (table 4).

Table 3. Cross Tabulation between Aspects of Personal Safety and Age

Characteristics of the Respondents	Personal Safety Aspect						Total	
	Not Safe		Moderately Safe		Safe			
	n	%	n	%	n	%	n	%
Young	4	12,9	25	80,6	2	6,5	31	100,0
Early worker	13	20,6	48	76,2	2	3,2	63	100,0
Middle-aged	15	19,5	58	75,3	4	5,2	77	100,0
Pre retirement	11	19,6	40	71,4	5	8,9	56	100,0
Retired	1	4,5	19	86,4	2	9,1	22	100,0
Elderly	2	18,2	8	72,7	1	9,1	11	100,0
Total	46	17,7	198	76,2	16	6,2	260	100,0

Based on the results of the analysis shown in table 3, it was known that the majority of fishermen (76.2%) were categorized as quite safe in terms of personal safety. However, there were 17.7% of respondents categorized as unsafe in terms of personal safety while sailing. From the proportion of safe behavior, it was known that the younger age group tends to behave safely in the aspect of personal safety compared to the older age (early workers), after that there was a tendency to increase in age, the personal safety of respondents consistently tends to increase until old age. The findings of this study were not in line with the results of previous studies that age was not significantly related to safe behavior at work (Setiarsih et al., 2017; Srisantyorini et al., 2021; Untari et al., 2021). Even in research conducted by Pratama (2015) it was said that younger age groups tend to behave safely at work. The research stated that the older group of workers had experienced a decrease in their physical and intellectual abilities so that they would tend to behave in a less safe manner.

Nonetheless, there is research that is in line with the findings of this study which states that the older age group tends to behave safely than the younger age (Apriluana et al., 2016; Shiddiq et al., 2014). The age factor is directly related to knowledge and logical thinking. Increasing age of a person tends to be accompanied by increased intelligence, knowledge, and the ability to control emotions. It is believed to be able to greatly reduce the risk of accidents. Although increasing age is not necessarily in line with increasing maturity, generally increasing age makes a person more

rational and avoids behavior that endangers safety (Shiddiq et al., 2014). In terms of public trust, someone who is older is more trusted than someone who is younger. This means that old age is one proof of experience and maturity of the soul (Hendrawan, 2020).

This study also states that the youngest age group tends to behave safely compared to the older age group (early workers). This could happen because the respondents in the younger age group were new fishermen who are adapting to their work, so they tended to be more careful. In addition, they still worked under the supervision of older fishermen so there were efforts to give a good impression on older fishermen (Shiddiq et al., 2014). This statement was in accordance with the findings in the field. The results of the interviews with the respondents revealed that young fishermen get sailing skills from older fishermen for generations. This also includes knowledge and habits that are carried out while sailing in relation to aspects of personal safety.

The aspect of personal safety is greatly supported by the safety equipment carried while sailing. Based on the results of interviews with fishermen, the majority of fishermen only have makeshift equipment when sailing, such as wearing long-sleeved shirts and jackets and hats and did not use any footwear while sailing. In addition, fishermen tended to prefer personal protective equipment that was comfortable to use to support safety when at sea. According to fishermen, if wearing glasses was seen as only disturbing their comfort while working, they felt uncomfortable to work. Some fishermen also think that accidents at work are a consequence of going to sea. The accidents that occurred to fishermen in three coastal areas of Jember Regency were like having experienced a ship flipping caused by high waves. Accidents often occur in the Pelawanan area of the Puger area which is the gateway for Puger fishermen to enter the South Sea.

Table 4. Cross Tabulation between Aspects of Personal Safety and Level of Education

Level of Education	Personal Safety Aspect						Total	
	Not Safe		Moderately Safe		Safe			
	n	%	n	%	n	%	n	%
No school	1	8,3	10	83,3	1	8,3	12	100,0
Elementary school	24	19,2	93	74,4	8	6,4	125	100,0
Junior high school	15	21,7	50	72,5	4	5,8	69	100,0
Senior high school	6	11,1	45	83,3	3	5,6	54	100,0
Total	46	17,7	198	76,2	16	6,2	260	100,0

Based on table 4 it is known that seen from the proportion of safe behavior, it is known that the group of respondents who tend to behave safely are respondents who have never attended school (8,3%). The higher the level of education attained by the respondent, the personal safety of the respondent while sailing consistently tends to decrease. The proportion of respondents with the highest education level (SMA) who behaved safely was the least (5.6%). However, to be able to confirm this relationship, further analysis is still needed using statistical test rules. This finding was very interesting because it was an anomaly with most research results showing that a higher level of education actually makes a person more likely to demonstrate safe behavior and reduces the risk of work accidents (Febriyanti & Suwandi, 2021; Terok, Y. C., Diana, V. D. D., Hilman, 2020; Untari et al., 2021). This was because the level of education is closely related to a person's level of knowledge (Demeianto et al., 2020).

The results of this study are also not in line with previous research on fishermen in other locations by Terok et al. (2020), which states that the majority of fishermen in Tambala Village, Tombariri District, Minahasa Regency are elementary school graduates and behave unsafely while

sailing so that the number of work accidents in this group of fishermen was very high. Likewise, Febriyanto's reseach (2021) states that the majority of fishermen on Derawan Island have elementary school education and behave in an unsafe manner at sea. In addition, those who engage in unsafe behavior tended to experience work accidents such as slips, scratches and shipwrecks.

The findings in this study were not in line with theory because fishing work for fishermen does not require a high educational background, because fishing was a menial job that relies more on muscles, experience and non-cognitif, so no matter how high the fishermen's education level is, it will not affect their fishing abilities (Zebua et al., 2016:93). However, without them realizing there were actually problems that arise when a person's level of education is low. Fishermen's income was uncertain because they depend on sea catches. Fishermen's spending doubles during storms and bad weather, as well as when there is an increase in fuel. The process of catching fish in Jember Regency still uses a simple method (using nets). The process of catching fish in Jember Regency still uses a simple method, namely using nets. This happened due to following the way of the predecessors and ignorance in using other fishing methods. With their low level of education or not even having graduated from elementary school, it will certainly be difficult for traditional fishermen to develop and use other, more profitable methods of catching fish.

Low income also affects the level of completeness of the provision of safety equipment on ships. Incomplete safety equipment will affect the behavior of fishermen in protecting themselves while sailing so that unsafe behavior arises. Dangerous actions from humans (human error) can be motivated by unsafe attitudes and behavior, lack of knowledge and skills, and physical defects that do not show fatigue and lethargy (Rinaldi et al., 2018:201). The low level of education also affects the lack of access to information related to safety while sailing so that in theory it can lead to unsafe behavior. Some examples of unsafe actions taken by respondents were not wearing complete PPE such as long sleeves, gloves, boots, head protectors, safety glasses, and life jackets which are only used when fishing, lifting weights in awkward body positions or with hunchback. They actually know the importance of using PPE but are reluctant to use it because they feel uncomfortable and actually interfere with work. Even though in theory, fishermen who do not wear complete PPE are more likely to get work accidents than workers who wear complete PPE (Mewengkang et al., 2022:155).

CONCLUSION AND SUGGESTION

Most of the fishermen in Jember Regency who were respondents in this study were middle-aged, and based on their last level of education, most of them had graduated from elementary school. The aspect of personal safety when sailing for the majority of respondents is in the quite safe category. The results of this study indicate that there is a tendency that the older the respondents are, the more they pay attention to aspects of personal safety when sailing. Based on the results of this study, it is necessary to improve personal safety aspects when sailing fishermen. This can be done periodically to educate fishermen about the importance of using PPE and safe behavior while sailing, especially for fishermen in the age group of 25-54 years. Fishermen also need help to equip PPE and safety equipment on board.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest in this research.

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