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# Analysis of Factors Causing Work Accidents in Fishing Groups in Fatubesi Village, Kupang City

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**Abstract:** The informal sector is a sector that is not organized, non-formal and not incorporated, so that its occupational health has not received optimal attention. More than 60% of Indonesia's total population lives in coastal areas with most of the livelihoods as fishermen. The activities of fishermen at sea have a considerable risk, so fishermen are vulnerable to being faced with changing sea conditions. Objective: This study aims to analyze the factors associated with the incidence of work accidents in fishing groups in Fatubesi Village, Kupang City. Methods: This study used a cross sectional quantitative approach. The population was fishermen in Fatubesi village, Kupang City and sampling using simple random sampling technique as many as 89 respondents. Data were collected through interviews using questionnaires and analyzed using chi-square techniques. Results: the results showed that there was a significant relationship between worker motivation and work accidents (p-value 0.002 < 0.05), skill variables with work accidents (P-value 0.000 < 0.05), and unsafe action relationships with work accidents (p-value 0.000 < 0.05). While there is no relationship between the knowledge variable and the Work Accident variable (p-value 0.221 > 0.05), and there is no influence of the Unsafe Environmental Conditions variable on the Work Accident variable, (p-value 0.447 > 0.05) Conclusion: Work accidents are a multifactor interaction that is a reflection of management. The scope of informal workers such as unorganized fishermen needs to consider the role of the government to be able to assist regulations related to occupational accident risk management. There needs to be a shift in the approach to preventing occupational accidents to improve the skills of fishermen, increase safety culture, and improve safety governance.

**Keyword:** Work Accident, Occupational Health, Fishermen, Work Safety

## INTRODUCTION

Indonesia is the fourth largest country with the largest population in the world. More than 60% of Indonesia's total population lives in coastal areas with most of their livelihood being fishermen and divers. There are around 8,090 coastal villages in Indonesia spread across 300 districts or cities. Around 67.87 million people out of Indonesia's 234.2 million population are informal sector workers and almost 30% are fishermen. The informal sector has a large role in developing countries including Indonesia. The informal sector is an unorganized, non-formal and unincorporated sector, so its occupational health has not received optimal attention. Rakhmawati, J., & Setyaningsih, Y. (n.d.).

Fishermen's activities in the sea have considerable risks, so that in their daily lives fishermen are vulnerable to being faced with changing sea conditions. One of the conditions of the sea that is easily changed is exposure to waves and wind and weather that is difficult to predict. In addition, the safety factor of ships and fishermen is something that needs to be considered for the success of a fishing operation Kincl, L., Syron, L., Lucas, D., Vaughan, A., & Bovbjerg, V. (2023).

Work accidents not only cause casualties but also material losses for workers and employers, but can disrupt the entire production process, damaging the environment which will ultimately have an impact on the wider community. Heinrich in his theory stated that unsafe acts are 88%, unsafe conditions are 10%, and "acts of God" are 2% or unavoidable events are the causes of work accidents. Unsafe work environment behavior and conditions are primary or direct causes. Meanwhile, human, environmental factors (physics, chemistry, biology, psychology) and management factors such as policy, decisions, evaluation, control, and administration are indirect causes. Darmani, S., et al. (2023).

The results of previous research showed that the unsafe action variable significantly affected work accidents and slipping/falling was the most common form of work accident experienced by fishermen and followed by being bitten by sea animals/being hit by thorns, tripping over machinery, and getting caught in rope. Another study on the Pantura fishermen's group showed that the results Rakhmawati, J., & Setyaningsih, Y. (n.d.). *of unsafe action* significantly affected work accidents, especially the use of non-standard safety equipment and joking in the workplace increased the risk of accidents by 6 times Latif, I., & Yulyanti, D. (2020).

Kupang City is located on the coast of Kupang Bay and has a coastline length of 22.7 km. The administration of the coastal area of Kupang City is located in two sub-districts and 15 sub-districts and most of the residents who live on the coast make a living as fishermen. Data from the Health Office in 2023 shows that not all health centers in the city of Kupang have UKK fostered posts as a forum for implementing preventive promotive activities in the informal sector. Based on the above background, the author wants to know more about the factors related to the occurrence of work accidents in the fishermen group in Fatubesi Village, Kupang City in order to map the needs of the group in the implementation of the occupational safety and health system.

## METHOD

The research design that will be used is quantitative analytical research using cross sectional design, namely research conducted at one time and one time to find the relationship between independent and dependent variables. In this study, the researchers analyzed the relationship of independent variables, namely personal factors (knowledge, work motivation, and skills), unsafe actions and unsafe conditions with dependent variables, namely the incidence of work accidents. The population in this study is all fishermen in the group of fishermen in the village of Fatubesi, Kupang is equal to 436 people.

The sampling process is carried out in this study using simple random sampling technique that is sampling technique performed each unit of the population has the same opportunity to be taken as a sample. random technique based on sampling frame list of fishermen in the village of fatubesi randomly selected by lottery. Large samples in this used using the Formula Lameshow and obtained the number of samples of 89 people. Data collection was conducted by interviewing using questionnaires to respondents. Furthermore, the analysis using chi square correlation bivariate test using SPSS.

## RESULTS AND DISCUSSION

The results of data processing in table 1 show that all respondents in this study were male, with a total of 89 individuals (100.0%). Respondents came from different age groups, the largest being 30-40 years old with 36 fishermen (40.4%), followed by 21-28 years old with 29 fishermen (32.6%) and then 14-20 years old with 18 fishermen (20.2%). On the other hand, the age group of 41-45 years has the least representation, namely 6 fishermen (6.7%). This distribution shows that most fishermen are of productive age, with a fairly significant proportion of young age. There were 38 respondents (42.7%) who reported working between 0-5 years, followed by 37 respondents (41.6%) who had worked between 5-10 years, and only 14 respondents (15.7%) who had worked between 10-15 years.

**Table 1. General Characteristics of Respondents**

| Respondent Characteristics | Frequency | Percentage |
|---|---|---|
| **Gender** | | |
| Man | 89 | 100.0 |
| **Age** | | |
| 14-20 years | 18 | 20.2 |
| 21-28 years old | 29 | 32.6 |
| 30-40 years old | 36 | 40.4 |
| 41-45 years old | 6 | 6.7 |
| **Education** | | |
| Not in school | 4 | 4.5 |
| SD | 25 | 28.1 |
| JUNIOR | 50 | 56.2 |
| SMA | 10 | 11.2 |
| **Ship ownership** | | |
| Alone | 7 | 7.9 |
| Others | 82 | 92.1 |
| **Working period** | | |
| 0-5 years | 38 | 42.7 |
| 5-10 years | 37 | 41.6 |
| 10-15 years | 14 | 15.7 |

Univariately, the distribution of respondents based on independent and dependent variables can be seen in the following table:

**Table 2. Frequency Distribution of Respondents Based on Knowledge**

| Knowledge | Frequency | Percentage |
|---|---|---|
| Good | 86 | 96.6 |

| | | |
|---|---|---|
| Enough | 3 | 3.4 |
| Total | 89 | 100.0 |

Table 2 shows that the level of knowledge of fishermen in Fatubesi, Kupang City, regarding occupational safety and health is mostly good, with 86 respondents (96.6%), while only 3 respondents (3.4%) have sufficient knowledge. A high percentage of fishermen with a good understanding indicate that the majority of them have understood the risks of work and the preventive measures that need to be taken to minimize work-related accidents and illnesses.

**Table 3. Frequency Distribution of Respondents by Skill**

| Skills | Frequency | Percentage |
|---|---|---|
| Good | 34 | 38.2 |
| Enough | 7 | 7.9 |
| Less | 48 | 53.9 |
| Total | 89 | 100.0 |

Table 3 shows that fishermen in Fatubesi, Kupang City, still show a low level of skill in the prevention of accidents and work-related diseases. Of the 89 respondents, only 34 (38.2%) had good skills, 7 (7.9%) had sufficient skills, while the majority, 48 (53.9%) had poor skills.

**Table 4 Frequency Distribution of Respondents Based on Motivation**

| Motivation | Frequency | Percentage |
|---|---|---|
| Good | 5 | 5.6 |
| Enough | 81 | 91.0 |
| Less | 3 | 3.4 |
| Total | 89 | 100.0 |

Table 4 shows that the motivation of fishermen from Fatubesi village, Kupang City, in implementing occupational safety is said to be sufficient compared to other respondents, 81 of whom (91.0%). On the other hand, only 5 respondents (5.6%) had good motivation and 3 respondents (3.4%) had low motivation.

**Table 5. Distribution of Respondent Frequencies Based on Insecure Conditions**

| Unsafe conditions | Frequency | Percentage |
|---|---|---|
| Good | 4 | 4.5 |
| Enough | 85 | 95.5 |
| Total | 89 | 100.0 |

The results of data processing showed that the unsafe conditions experienced by fishermen in Fatubesi Village, Kupang City, were mostly considered quite good, with 85 respondents (95.5%), while only 4 respondents (4.5%) rated the unsafe conditions as good. A high percentage in the category is enough to indicate that most fishermen are still under the threat of many risk factors that can lead to occupational accidents or work-related illnesses, although they are not entirely critical.

**Table 6. Frequency Distribution of Respondents Based on Unsafe Behavior**

| Behaviour | Frequency | Percentage |
|---|---|---|
| Good | 32 | 36.0 |

| | | |
|---|---|---|
| Enough | 24 | 27.0 |
| Less | 33 | 37.1 |
| Total | 89 | 100.0 |

The results of data processing in table 6. 32 respondents (36%) showed safe work behavior, 24 respondents (27%) and 33 respondents (37.33%) showed unsafe behavior.

**Table 7. Frequency Distribution of Respondents Based on the Occurrence of Work Accidents**

| Work accidents | Frequency | Percentage |
|---|---|---|
| Yes | 60 | 67.4 |
| Not | 29 | 32.6 |
| Total | 89 | 100.0 |

Table 7 shows that most fishermen from Fatubesi District, Kupang City, have experienced work accidents, with 60 respondents (67.4%) reporting having experienced accidents while working, while only 29 respondents (32.6%) have not experienced work accidents.

**Table 8. The Relationship of Knowledge to Work Accidents**

| | Yes | | Not | | | P Value |
|---|---|---|---|---|---|---|
| | N | % | n | % | | |
| Good | 57 | 64 | 29 | 32,6 | 86 | 0.221 > 0.05 |
| Enough | 3 | 3,4 | 0 | 0 | 3 | |
| Total | 60 | 67,4 | 29 | 32,6 | 89 | |

The results of the bivariate analysis in table 8. show the relationship between the level of knowledge and the incidence of work accidents in fishermen in Fatubesi Village, Kupang City, the chi square statistical test shows a p-value of 0.221 (> 0.05), which means that there is no significant relationship between the level of knowledge and the incidence of work accidents.

**Table 9. The Relationship Between Motivation And Work Accidents**

| Motivation | Work Accidents | | | | Total | P-value |
|---|---|---|---|---|---|---|
| | Yes | | Not | | | |
| | N | % | n | % | | |
| Good | 0 | 0 | 5 | 5,6 | 5 | 0.002 < 0.05 |
| Enough | 57 | 64 | 24 | 27 | 81 | |
| Less | 3 | 3,4 | 0 | 0 | 3 | |
| Total | 60 | 67,4 | 29 | 32,6 | 89 | |

In table 9. The results of the chi-square analysis of the relationship between motivation and work accidents in the respondent group showed a p-value of 0.002 (< 0.05), which means that there is a significant relationship between motivation and the incidence of work accidents. Furthermore, the statistical test between skills and work accidents showed a p-value of 0.000 (< 0.05), which means that there is a significant relationship between skills and the incidence of work accidents.

**Table 10. The Relationship of Skills to Work Accidents**

| Skills | Work Accidents | | | | Total | P-value |
|---|---|---|---|---|---|---|
| | Yes | | Not | | | |
| | N | % | n | % | | |
| Good | 10 | 11,2 | 24 | 27 | 34 | 0.000 < 0.05 |
| Enough | 4 | 2,45 | 3 | 3,4 | 7 | |
| Less | 46 | 51,7 | 2 | 2,2 | 48 | |
| Total | 60 | 67,4 | 29 | 32,6 | 89 | |

**Table 11. Unsafe Behavior Links With Work Accidents**

| Unsafe Behavior | Work Accidents | | | | Total | P-value |
|---|---|---|---|---|---|---|
| | Yes | | Not | | | |
| | N | % | n | % | | |
| Good | 3 | 3,4 | 29 | 32,6 | 32 | 0.000 < 0.05 |
| Enough | 24 | 27 | 0 | 0 | 24 | |
| Less | 33 | 37,1 | 0 | 0 | 33 | |
| Total | 60 | 67,4 | 29 | 32,6 | 89 | |

In table 11. Statistical tests showed a p-value of 0.000 (< 0.05), which means that there is a significant relationship between Unsafe Behavior and the incidence of work accidents. Meanwhile, table 12 Statistical tests showed a p-value of 0.447 (> 0.05), which means that there was no significant relationship between unsafe environmental conditions and the incidence of work accidents

**Table 12. The Relationship of Unsafe Environmental Conditions with Work Accidents**

| Unsafe Environmental Conditions | Work Accidents | | | | Total | P-value |
|---|---|---|---|---|---|---|
| | Yes | | Not | | | |
| | N | % | n | % | | |
| Good | 2 | 2,2 | 2 | 2,2 | 4 | 0.447 > 0.05 |
| Enough | 58 | 65,2 | 27 | 30,3 | 85 | |
| Total | 60 | 67,4 | 29 | 32,6 | 89 | |

**Discussion**

Based on the results of the research that has been conducted, it was found that the level of knowledge of fishermen in Fatubesi Village, Kupang City, regarding work safety is relatively high. Of the 89 respondents, 96.6% had good knowledge while only 3.4% had sufficient knowledge. This shows that most respondents have understood the various health risks that may occur while doing work as fishermen and the occupational safety measures that can be taken. Although most of the respondents had a good level of knowledge, statistical tests showed that there was no significant relationship between knowledge and the occurrence of work accidents with a p value of 0.221 (> 0.05).

Based on the theory of loss causation model , knowledge is not the only personal factor as the basic cause of work accidents. This is supported by research conducted to examine the structure of the relationship between knowledge factors, motivation and skills in traditional and small fishermen in Banten Bay using the Partial Least Square - Structural Equation Model (PLS-SEM) analysis which shows that skill results are a factor that has a real influence on competence compared to the knowledge and self-attitude of fishermen. While the aspect of

knowledge has a great influence on skills and self-attitude. The results of this study are in line with research conducted in the Kupang City area, showing that the results also found that the level of knowledge was not related to the incidence of work accidents and work-related diseases in sea cucumber fishermen in Namosain Village. In addition, research related to work accidents in construction workers groups showed that there was no correlation between K3 knowledge and the incidence of work accidents. Noviyanti, R. (2019). Tafui, M. A., Roga, A. U., Hinga, I. A. T., & Environment, B. K. (n.d.). Nabila, S. P., & Widowati, E. (2022).

Statistical analysis of the motivation chi square test has a significant relationship with the occurrence of work accidents with a p-value of 0.002 < 0.05. Based on these results, it can be assumed that highly motivated fishermen tend to have fewer work accidents compared to those with low motivation. Motivation as part of the personal factor is the motivation to act. The results of this study are in line with the research conducted by Suherdin, et al Suherdin, S., & Sutriyawan, A. (2023).. to find out the factors related to work accidents based on the Loss Causation Model showing that there is a relationship between motivation and work accidents, where workers with low motivation are 36 times more likely to experience work accidents than workers with high motivation.

Other studies that are in line show that autonomous motivation is positively correlated with general health and job satisfaction and negatively correlates with depression, fatigue, thus affecting the incidence of work accidents. Controlled motivation, demotivation, and external regulation are related to indicators of fatigue, while autonomic motivation is protective. Safety motivation and work pressure are important predictors of the rate of work accidents. Workers must be able to understand the motivations designed to achieve goals and how their performance will be evaluated. Therefore, increasing motivation and reducing work pressure on high-risk jobs is an effective way in which organizations can lower the rate of work accidents. D'Alleva, A., et al. (2023). Rahimi Pordanjani, T., & Mohamadzade Ebrahimi, A. (2015).

Based on the results of the study, it was found that there was a significant relationship between skills and the incidence of work accidents among fishermen in Fatubesi, Kupang City. In the development of work accident theory, various opinions have emerged that reveal that work accidents are not caused by a single factor, but multifactor interactions that are a reflection of management. Frank E Bird in theory Loss Causation Model Stating worker skills is part of the basic cause of work accidents. The results of this study are in line with research by Nunez, et al. on workers in several European countries that showed that less skilled workers are more likely to suffer work-related injuries. Lack of skills is a temporary situation that should not be maintained in the long term. However, the consequences of accidents caused by a lack of expertise and lack of incentives to protect disadvantaged human resources need to be considered.Laksono, A. D., Setyaningsih, Y., & Lestantyo, D. (2025).Nuñez, P. D. I., & Prieto, M. (n.d.).

Another study on fishermen groups in the Derawan area showed that there was a relationship between the skill factor and the occurrence of work accidents in the fishermen group. Respondents who had never participated in the training had a 5.5 times chance of experiencing a work accident compared to respondents who had participated in the training. . Research related to factors affecting the work safety behavior of fishermen in Semarang City, also showed a significant relationship between safety training and safety behavior (p = 0.000). The study underscores the importance of enhancing educational efforts and promoting positive safety perceptions to improve safety behaviors in high-risk fishermen's occupations.Mawafasyah, J., & Febriyanto, K. (2020). aksono, A. D., Setyaningsih, Y., & Lestantyo, D. (2025).

Based on the results of the research conducted, it was found that there was a significant relationship (p-value of 0.000 (< 0.05)) between Unsafe Behavior with Work Accident Incident

fishermen in Fatubesi Village, Kupang City. . This means that the worse a fisherman's work behavior is, the higher their risk of having an accident at work. The results of this study are relevant to the theory Loss Causation Model that is, one of the direct causes of work accidents is unsafe actions (unsafe action). Study Case Control conducted on fishermen groups to examine risk factors that affect the frequency of work accidents among fishermen on Lae-Lae Island showed that the two largest risk factors for work accidents among fishermen on Lae-Lae Island were work fatigue and failure to wear personal protective equipment. To reduce accidents in the fishing industry, regulations are needed that encourage the use of personal protective equipment (PPE), K3 training, and increased awareness Patandung, L., Thamrin, Y., Wahyu, A., Furqaan Naiem, M., & Amiruddin, R. (2025).

The results of a similar study by Herawati, et al in the Tempura area also showed that there was a relationship between unsafe actions and the occurrence of work accidents with a p-value of 0.001. Companies should provide regular K3 socialization about unsafe actions either through education or training and implement and supervise K3 regulations optimally for workers. It is expected to increase awareness of K3 and compliance with the applicable work procedure standards in the workplace. Herawati, C., Priliana, A., Yulistiyana, L. N., Dhani, A. H., Kristanti, I., & Mutiah, D. (2025).

Although many fishermen still face various environmental challenges, such as large waves, extreme weather, and lack of safety facilities at sea, the results of a statistical test using the chi-square method showed a p-value of 0.447 (> 0.05). This means that unsafe environmental conditions do not have a significant relationship with work accidents, or in other words, fishermen still have work accidents despite working in relatively safe environmental conditions, and conversely, there are also those who do not have accidents despite working in unsafe conditions.

The results of the study showing that there is no significant relationship between unsafe environmental conditions and the occurrence of work accidents are in line with existing theories. According to Heinrich's Domino Theory , workplace accidents are caused by a chain of several causes, one of which is an unsafe act. Heinrich stated that 88% of work-related accidents were caused by unsafe actions of workers, 10% were caused by unsafe conditions in the work environment, and 2% were caused by factors beyond their control Ms, R., Mk, U., & Mohammad, I. (2024).. The results of this study are in line with a study conducted on fishermen groups in the Tanji area that the danger despite the environment/climate is 21%, but fishermen who use PPE tend to experience less occupational hazards compared to those who do not use PPE and fishermen who do not have fishing safety rules are more likely to be injured compared to other categories so it is necessary to strengthen safety regulation services for workers this work.Barrow, A., et al. (2022).

Other research in the informal sector also showed that there was a link between unsafe actions and work accidents, but there was no association between unsafe conditions and work accidents. An unqualified work environment has the potential to cause work accidents. Workplace conditions that fall into the category of unsafe conditions do not fully affect the ability of workers to apply self-protection measures while working to avoid work accidents. The company can provide information to workers about work accidents that can occur due to unsafe actions, such as smoking while working, piling up goods beyond the maximum limit, carrying excess loads, working in drowsy conditions or working in a hurry Najihah, K., Salmira, C. S., Ramadhani, S., Apriani, N., & Hasibuan, S. S. (2023).

## CONCLUSION

The results showed that there was a significant relationship between worker motivation and work accidents (p-value 0.002 < 0.05), skill variables and work accidents (P-value 0.000 < 0.05), and the relationship between Unsafe Actions with work accidents (p-value 0.000 <

0.05). Meanwhile, there was no relationship between the knowledge variable and the work accident variable (p-value 0.221 > 0.05), and the variable of unsafe environmental conditions with the work accident variable (p-value 0.447 > 0.05). Work accidents are multifactorial interactions that are a reflection of management. The scope of informal workers such as unorganized fishermen needs to be considered for the role of the government to be able to assist in regulations related to work accident risk management. A shift in approaches to occupational accident prevention is needed to improve the skills of fishermen, improve the culture of occupational safety, and improve safety governance

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