The Association between Safety Training Experience and Work Accident Among Small Boat Fisherman: A Case Study in Belawan, Medan, Indonesia

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Abstract. Work accident among small boat fisherman remains public health issues that had been reported among 248 death cases and 564 missing cases throughout 2002-2018. Human factor contributed 43% triggered work accident among small boat fisherman. Several studies elsewhere reported correlation between safety training experience with work accident however there is limited study found with safety training experience and work accident among small boat fisherman. This study aims is to investigate the association between safety training experience and work accident among small boat fisherman: a case study in Belawan , Medan, Indonesia. A case control study was applied in this study with cases having experience in work accident. Purposive sampling was used to collect samples and face-to-face interviews were conducted with trained enumerators. We run logistic regression to analyze data as a multivariate analysis. A total of 98 fisherman was selected with 49 cases and 49 controls. This result found that there is association between safety training experience and work accident among small boat fisherman (Pvalue = 0.000). Fisherman who had safety training experience is less frequency to have work accident during fishing (Odd ratio: 0.014, 95%CI + 0.002-0.083). Developing safety training among fisherman is an important role to prevent work accident with enhancing occupational health unit in Public Health Center.

Keywords: safety training experience, Fisherman, Work accident

INTRODUCTION

The focus of work accidents on local fishermen is still a public health problem because the number of accidents continues to increase every year, it was recorded that in 2010-2014 there were 920 fishermen who died in marine accidents.[1] FAO reports that as many as 24,000 fishermen per year die at sea during fishing activities.[2] It is recorded in the annual report of the National Transportation Safety Committee (NTSC) regarding the incidence of shipping transportation accidents from 2015-2020 as many as 87 reported accidents.[3] The impact of work accidents on fishermen resulted in the death of fishermen (56%)[4] , as well as productivity loss (18.5%)[5] and resulted in the economic impact of fishermen who had work accidents.

Several studies show that the knowledge, attitudes and behavior of fishermen about work safety are still low. This is in line with research conducted at PPP Muncar, Banyuwangi, which

stated that the competence possessed by fishermen is quite low because fishermen only master 33.31% of the competencies that fishermen should have, while 66.69% of other elements of competence fishermen have not mastered it.[6] The same thing was also found in a study conducted in Belang Village, Southeast Minahasa, that most fishermen have a negative/ less attitude about work safety as much as 56%.[7] Likewise, the behavior in research conducted in Agam Regency, that fishermen with bad behavior are 68%.[8]

IMO (*International Maritime Organization*) states that some of the risks of work accidents on fishermen are influenced by several factors, namely, human error factors of 43.06%, natural factors 33.57%, and technical factors 23.35%. [9] To determine the accuracy of the risk of work accidents on fishermen, a *case-control design is used* . This design is more appropriate for groups with rare events. Work accidents on fishermen in Indonesia were recorded throughout 2019 as many as 90 cases of work accidents, and in Medan (3.4%) [10] with a small prevalence of work accidents, the *case-control research design* can be used to investigate the causality of the risk of the dominant factors of work accidents. on fishermen.

The limited information about fishermen's occupational accidents in Indonesia makes information in the formulation of occupational safety and health policies for fishermen not effective. This also has an impact on the number of fishermen's work accidents and the absence of monitoring data observations at the Occupational Health Effort Post (UKK Post) in Belawan. Therefore, this study aims to determine the relationship between work safety training experiences for fishermen and work accidents

METHOD, DATA, AND ANALYSIS

Study settings

The study was conducted in the coastal area of Bagan Deli, Belawan with 16.1% of fishermen. [11] Belawan was chosen as the study location considering that the majority of the population's livelihoods are fishermen, and Belawan is an international sea lane crossing the Malacca Strait and has a port and has a tropical rain forest climate with an unclear dry season. [12]

Case-control is used in this study to examine the relationship between work accidents and certain risk factors, with a case group based on fishermen who experienced work accidents in January-May 2020 and a control group based on fishermen who did not experience work accidents in January-May. 2020. This study defines a work accident as an unwanted and unexpected event that can cause loss of life and property. [13]

Population and sample

The sample in the case group was taken based on the number of fishermen's work accident data recorded at the Occupational Health Effort Post as many as 50 respondents, but according to the research criteria there were 49 respondents, this was because 1 fisherman could not be found. The control group sample was taken based on the research criteria with a total of 49 respondents who live in the Bagan Deli area, Belawan and are willing to be interviewed.

Research Instruments

The interview instrument used consisted of five parts. The first part of the questionnaire contains questions about demographic characteristics including age, years of service, OSH education and training. The second part of the questionnaire includes questions about knowledge related to occupational safety and health of fishermen. The third part of the questionnaire consists of attitudes towards work accidents, which are assessed by six statements that explore the actions of fishermen; (1) work must be vigilant, (2) PPE to prevent accidents, (3) PPE is mandatory for fishermen, (4) first aid kit is available on board, (5) risk control to prevent accidents, (6) good work methods/ positions. Four items on the Likert scale were used to identify attitudes, namely strongly agree, agree, disagree and strongly disagree. The fourth part of the questionnaire explores behavior at work, two positive statements; (1) First aid kit is required on board, and (2) use of PPE to minimize danger, as well as three negative framed statements; (1) chatting at work, (2) rushing to get the job done quickly and (3) smoking at work. The fifth part of the questionnaire consists of three questions that measure the incidence of work accidents about having an accident or not, the type of accident, and the body part injured from the accident.

Statistic analysis

All test statistics were analyzed using IBM SPSS statistics 20.0. The incidence of work accidents is explained using descriptive statistics. The chi-square test was used to determine the relationship between the independent and dependent variables. Independent variables with p-value < 0.25 in

bivariate analysis were included in multivariate analysis. Adjusted odds ratio (OR) and predictors of occupational accidents were determined in multivariate analysis.

RESULTS AND DISCUSSION

Table 1 shows the characteristics of the fishermen interviewed. The majority of respondents are 45 years old (**52.0** %), with the same number of years of service in both groups, high knowledge (58.2%), good attitude (71.4%) and no risk behavior (74.5 %). However, the level of education is still basic (74.5%), not participating in K3 training (66.3%), the ship's floor is at risk (54.1%) and equipment is also at risk (58.2%) of work accidents.

Table 1 . Demographic Characteristics

Variable	N(%)
Age	
45 Years	51 (52.0)
< 45 Years	47 (48.0)
Years of service	
< 18 Years	49 (50.0)
18 Years	49 (50.0)
Education	
Base	73 (74.5)
Tall	25 (25.5)
OHS training	
Yes	25 (33.7)
Not	65 (66.3)
Work accident	
Yes	49 (50.0)
Not	49 (50.0)
Type of Work	
Wound	23 (46.9)
Can Sea Animals	15 (30.6)
Fall Into the Sea	2 (4,1)
Sprain	3 (6,1)
Slip	6 (12,2)
Injured body	
Hand	18 (36.7)
Foot	28 (57.1)
Body	2 (4,1)
Neck	1 (2.0)
Slippery floor	
Risk	53 (54.1)
No Risk	45 (45.9)
Equipment	
Risk	57 (58.2)
No Risk	41 (41.8)

Table 2 shows the relationship between risk factors and the incidence of work accidents in fishermen. Fishermen who did not attend K3 training had a significantly greater impact on occupational accidents than fishermen who took OSH training (OR: 0.03; 95% CI: 0.005-0.114). Fishermen with low knowledge were significantly more affected by work accidents than fishermen with high knowledge (OR: 3.69; 95% CI: 1.58-8.64). Fishermen with slippery floor conditions had a significantly greater impact on work accidents than those with non-slippery floors (OR: 0.33; 95% CI: 0.15-0.77). And fishermen with risky equipment significantly affect work accidents compared to fishermen who have no risky equipment (OR: 2.56; 95% CI: 1.21-5.86). Meanwhile, age, years of service, education, attitudes and behavior did not have a significant relationship to work accidents (p value > 0.05).

Table 2 . Risk factors for work accidents in fishermen

	Cases	Control	*P*	OR
Age				
45	26 (53.1)	25	0.840	0.9
< 45	23 (46.9)	24		
Years of				
< 18	20	29	0.069	0.48
18 Years	29	20		
Educati				
Base	33	40	0.105	0.46
Tall	16	9 (18.4)		
OHS				

Not	18	47	0.000	0.03
Yes	31	2 (4,1)		

This study underscores that the proportion of fishermen who have attended K3 training experienced work accidents of 63.3%. This is lower than the level reported in East Kalimantan (100%). [14] With the risk of work accidents in fishermen who did not attend K3 training 0.025 times greater than fishermen who participated in K3 training (OR=0.025 ; 95%CI 0.005-0.114). Basically, not all fishermen in the Belawan area are members of the Occupational Health Effort Post, only a few because the focus of the work area is still in the Bagan Deli village, Belawan. Therefore, there are still many fishermen who do not know proper occupational safety and health training when doing work on the sea. Training can increase workers' knowledge of something related to their work in this case, namely about work safety and the risks of accidents in their work. [15] To minimize accidents at sea, it has been regulated in Law Number 45 of 2009, that the government organizes education, training and fishery counseling to improve the development of fishery human resources. [16]

The proportion of low knowledge of having an accident at work is 57.1%, this is lower than the rate reported in Minahasa (100%).[17] This is because the lower the level of knowledge, the higher the number of work accidents.[18] Problem identification carried out on ABK Machines in Cirebon stated that the lack of skills, experience and knowledge of work safety resulted in an accident in carrying out work activities. One of the factors that cause work accidents is *unsafe conditions* , namely in the form of neglected work machines and equipment, the absence of protection from both equipment and self so that it affects the occurrence of work accidents. [21] Efforts that need to be implemented are adding safety to moving/rotating machines by providing protection in the form of wire fences or the like in order to minimize accidents such as slashing to being cut while working.

CONCLUSION

Study this conclude that there is significant relationship among experience training safety work with accident work on fisherman.

IMPLICATION/LIMITATION AND SUGGESTIONS

Effective control is carried out by developing knowledge of fishermen through health partners such as the Occupational Health Effort Post (UKK) by participating in training and counseling on occupational safety and health at sea.

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