A Risk Assessment on Occupational Health and Safety in fishing activities in Gevaş District (Van, Türkiye) for Healthcare Management

Özgür Cengiz^{1,*}, Muhammet Demir², Ahmet Sepil³, and Mehmet Şeremet⁴

 ¹Fisheries Faculty, Van YüzüncüYıl University, Van, Türkiye https://orcid.org/0000-0003-1863-3482
² Republic of Türkiye Ministry of Agriculture and Forestry, Van Directorate of Provincial Agriculture and Forestry, Van, Türkiye https://orcid.org/0000-0001-8745-4870
³Fisheries Faculty, Van YüzüncüYıl University, Van, Türkiye https://orcid.org/0000-0002-3201-5181
⁴Maritime Faculty, Van YüzüncüYıl University, Van, Türkiye https://orcid.org/0000-0003-3416-4794

Received: 2023-05-12

Accepted: 2023-08-06

Abstract

In this study, the commercial fishing activities, which is one of the oldest professions, is categorized as the most dangerous profession both in the world and in Turkey due to the workplace and working conditions. Diseases and accident rates are high in the aforementioned occupational group. The current study was carried out by face-to-face survey method with fishermen from April 2022 to September 2022 and the "*L type matrix*" method to evaluate possible risk factors in fishing activities in Gevaş district in terms of occupational health and safety. The important risk factors; "Having no training in occupational health and safety (OHS)", and "Fatigue from irregular and long working hours" affect on the working conditions of the fishermen. This research is the first for Gevaş region and is expected to be a reference for future studies.

Keywords: Gevaş; Fishing activities; Occupational Health; Occupational Safety; Healthcare Management.

^{*}Corresponding Author's Email: ozgurcengiz17@gmail.com

1. Introduction

Although occupational safety and health issues were first introduced scientifically by the Italian Bernardino Ramazzini (1633-1714), the author of the occupational disease book called *"De Morbis Artiricum Diatriba"*, its real development was England, where industrialization began in the 17th and 18th centuries (Çağlayan and Kılınç, 2005). Occupational health and safety (OHS) is defined as all of the systematic and scientific studies that plan to improve the working environment and to be protected from the dangers and health threats that occur during or after the work activities (İşler, 2013).

Commercial fishing activities, which are considered to be one of the oldest professions, are accepted as the most dangerous profession both in the world and in Türkiye due to the workplace and working conditions. Persons engaged in fishing activities at sea cannot receive health services like people on land when they are faced with events such as illness, accident and injury, and they need the help of other people on the boat until they are landed. In addition, fishermen do not have a monthly salary. They are the people who make their living on the basis of giving a share from the catch they catch. While this situation creates certain advantages in financial terms, the fact that they want to stay in the sea even in harsh sea and weather conditions, getting tired as a result of extended working hours, causes fishermen to come face to face with more risks (Soykan, 2018; Atay and Cengiz, 2022). Because of this, fishing activities have the highest risks for both deaths and serious injuries (Köse and Erdoğan Sağlam, 2023).

No study about OHS for the fishermen has been done before in Gevaş district (Van, Türkiye). In this study, it is aimed to reveal the hazards faced by the workers in the fishing boats in the region in terms of occupational health and safety and the precautions that can be taken.

2. Materials and methods

2.1. Study area

Gevaş district is one of the 13 districts of Van province and is approximately 53 km away from Van province. This district is one of the areas where important fishing activities are carried out in the Van Lake basin (Figure 1).

2.2. Data gathering

Between April 2022 and September 2022, the commercial fishermen were asked 30 questions through face-to-face surveys in Gevaş district. The questions have been represented in Section3.

142 A Risk Assessment on Occupational Health and Safety in fishing activities in Gevas District (Van, Türkiye)



Figure 1. Gevaş (Van, Türkiye)

2.3. Method

In order to analyze the risk factors of fishing activities in Gevas district, the "L Type Matrix" method was used because it is practical in the field and easy to be applied to all sectors. The "L-Type Matrix" method is a method used in the analysis of the cause-effect relationship . In this method, the probability of occurrence of a risk/dangerous event (Table 1) and the severity of this risk/dangerous event if it occurs (Table 2) take numerical values from 1 to 5. Afterwards, the risk score is obtained by multiplying the probability of occurrence of the risk/dangerous event and the degree of severity of this probability (Table 3). Thus, the actions to be taken (control measures) are decided (Özkılıç, 2005).

Possibility **Risk Realization Frequency** Too small Hardly ever (1) Small (2) Very little (once a year) Medium (3) Few (several times a year)

(4)

(5)

Table 1. Realization probability of the risk

High

Very high

A risk assessment table was created for the fishermen in Gevaş district using the "L Type
Matrix" method. The sample table has been prepared based on personal observations and
experiences by Tantoğlu (2016) and Soykan (2018). In Table 4, 30 important risks and possible
consequences of risks are indicated.

Frequently (once in a month)

Very often (once a week / every day)

In the research, the fishermen were asked:

a) What the current safety measures are against these risks and the possible consequences of the risks,

- b) The probability of the occurrence of these risks and the severity of these risks if they are faced,
- c) Whether the current safety measures are sufficient by creating a risk score,
- d) Even if it is sufficient, it has been decided that additional safety measures should be taken.

Table 2. Seventy of the fisk, if featized						
Severity		Possible Outcome				
Very light	(1)	No loss of working hours, needing first aid				
Light	(2)	No loss of working hours, no lasting effect and requiring outpatient treatment				
Medium	(3)	Condition that causes minor injury and requires inpatient treatment				
Serious	(4)	Condition that causes serious injury and requires long-term treatment, occupational disease				
Very serious	(5)	Condition causing death or permanent incapacity for work				

Table 2. Severity of the risk, if realized

Table 3. Deciding the action to be taken according to the risk score

Risk Score	Meaning	Action						
1	Minor risks	There is no need to take measures to eliminate the identified risks.						
2-3-4-5-6	Low risks	There is no need for additional measures to eliminate the identified risks. Existing measures need to be maintained and their sustainability monitored.						
8-9-10-12	Medium risks	Although not urgent, measures should be taken to reduce the identified risks.						
15-16-20	High risk	Work should not be started until the risk has been reduced. Considerable resource allocation may be required to mitigate risk. If business is to continue despite this risk, urgent measures must be taken.						
25	Intolerable risks	Work is not started until the identified risk is reduced to an acceptable level. Ongoing activities are stopped.						

3. Results and Discussion

Face-to-face interviews were made with 45 commercial fishermen in Gevaş district and the findings in Table 4 emerged as a result of the answers given by them. The likelihood and severity of the risk are the average of the numerical values given by the fishermen.

144 A Risk Assessment on Occupational Health and Safety in fishing activities in Gevaş District (Van, Türkiye)

			Risk Level			
Risk/Dangerous Event	Possible Outcome	Current Safety Measure	Likeli hood of Risk	Severity of Risk	Risk Score	AdditionalSafet y Measure
1) Not checking the weather before sailing	Boat sinking, loss of life	Weather is checked, regularly	1	4	4	Current safety measure are sufficient
2) The occurrence of unpredictable weather conditions	Boat sinking, loss of life	Boats return to fishing coastal structure	1	3	3	Current safety measure are sufficient
3) Not using the pier during boarding and disembarking.	Falling overboard, injury	The scaffold is in continuous use	1	2	2	Current safety measure are sufficient
4) Boats are not equipped with fenders	Damage/materia l loss caused by boats rubbing against each other	There are fenders, but not enough	2	3	6	The number of fenders should be increased
5) Unevenness of the working area on the deck	Injuries resulting from falls, loss of life	Working area is kept tidy	1	2	2	Current safety measure are sufficient
6) Working hanging from the deck	Falling overboard, loss of life	Not working by hanging	2	1	2	Current safety measure are sufficient
7) Netting not neatly stacked on deck	Injury from tripping and falling	Network is regularly stacked continuously	1	2	2	Current safety measure are sufficient
8) Fishermen's inexperience	Injuries, decreased in work efficiency	Newly hired fisherman is being informed	4	3	12	This information should be provided by specialized institutions
9) Working in wet and cold conditions	Employee cold, decrease in work efficiency	Fishermen wear underwear and overalls	1	1	1	Current safety measure are sufficient
10) Letting go of the rudder	Boat sinking, loss of life	The captain is always at the helm.	1	1	1	Current safety measure are sufficient
11) Falling overboard	Death by drowning	All fishermen can swim	1	1	1	Current safety measure are sufficient
12) Noise	Not hearing instructions	Sign language is used when necessary	1	2	2	Current safety measure are sufficient
13) Transport of catch/fishing gear	Injuries to the hands, back and lumbar	Fishermen help each other	3	2	6	Current safety measure are sufficient
14) Slippery deck	Injuries resulting from falls	Fishermen wear non-slip boots	1	1	1	Current safety measure are sufficient

Table 4. Risk analysis results of fishing activities in Gevaş district.

15) Fatigue from irregular and long working hours	Injuries, decreased in work efficiency	No current safety measures	3	5	15	Fishermen must work in shifts
16) Getting tangled in the net while the net is being laid	Falling overboard, loss of life	The net is thrown into the sea by experienced people	1	1	1	Current safety measure are sufficient
17) Fire	Boat sinking, loss of life	Such a situation has never happened	1	1	1	Fire extinguishers should be available on the boats
18) Insufficient number of life- saving equipment	Loss of life	Sufficient life- saving equipment is available and placed in a visible place.	1	1	1	Current safety measure are sufficient
19) Fishermen do not know how to swim	Death by drowning	All fishermen can swim	1	1	1	Current safety measure are sufficient
20)Absence/contr ol of litter boxes	Environmental problems, risk of infectious disease, hygienic problems	There are trash cans and they are emptied at every return to port.	1	1	1	Current safety measure are sufficient
21) Lack of hygiene in the boat galley	Food poisoning	Foodstuffs and kitchen are cleaned regularly	1	1	1	Current safety measure are sufficient
22) Lack of hygiene in common areas such as WC	Hygienic problems	Common areas are cleaned daily	1	1	1	Current safety measure are sufficient
23) The shelves are not fixed	Injury from tipping	Shelves are fixed	1	1	1	Current safety measure are sufficient
24) Problems with freshwater requirement	Infectious disease risk, hygienic problems	There is no problem with the freshwater requirement.	1	1	1	Current safety measure are sufficient
25) Lack of first aid cabinet on the boat	Injury	There is a first aid cabinet according to the first aid regulations	1	1	1	Current safety measure are sufficient
26) Lack of first aid training	Injury	Fishermen have the information they need	1	3	3	Current safety measure are sufficient
27) Having no training in occupational health and safety (OHS)	Injury, loss of life, occupational disease, material damage	No informing about OHS	5	4	20	Fishermen should be given training in OHS as soon as possible

28) Trying to land before the boat docks fully at the pier	Falling overboard, injury	No current safety measures	4	2	8	Do not go ashore before the boat is moored to the port and the engines are turned off.
29) Insufficient communication in case the boat is moored to the pier	Falling overboard, injury	It is stated that the communication is made by a single expert.	1	1	1	Current safety measure are sufficient
30) Electric leakage	Injuries due to electric shock, loss of life, fire	It is stated that the sockets are solid	3	3	9	Plugs should be checked periodically.

146 A Risk Assessment on Occupational Health and Safety in fishing activities in Gevaş District (Van, Türkiye)

As a result of the answers given by the fishermen, it was observed that 16 of the 30 risks were in the insignificant risk group (53.3%), 9 of them were in the low risk group (30.0%), 3 of them were in the medium risk group (10.0%) and 2 of them were in the high risk group (6.7%) (Figure 2). In this study, "Having no training in occupational health and safety (OHS) and "Fatigue due to irregular and long working hours" are in the high-risk group. The same results were obtained in different studies conducted in the Çitören (Atay and Cengiz, 2022) and Lake Erçek (Cengiz, 2022) regions of the Van Lake Basin.From this point of view, FAO (2001), Roberts (2004), Jensen et al. (2014), etc stressed that fatigue is one of the main factors affecting accidents in the marine environment. And what's more, Asyalı and Kızkapan (2012) stated that the risk of accidents in marine environments increases due to overwork and resulting fatigue of fishermen.



Figure 2. Proportional distribution of risk groups

Conclusion

It is known by the experts of the subject that the fishing industry is a sector that results in death and/or serious injuries, especially due to harsh weather conditions, is open to work accidents and negatively affects the health of fishermen, and as a result triggers occupational diseases. Since health management is directly related to human life, occupational accidents in fishing activities and occupational diseases that naturally reflect this should be considered in terms of healthcare management.Healthcare management includes studies on all kinds of factors that can negatively affect both the physical and mental health of fishermen and are activities that aim to eliminate, prevent and correct these factors.As a result of work accidents and occupational diseases, an atmosphere of fear and insecurity may arise among fishermen, loss of income and psychological and mental problems may occur.In addition, the cost of work accidents and occupational diseases for workers, employers and the country is a separate problem.In order to minimize these situations, fishermen should be informed and trained at every opportunity by experts about their jobs, occupational health and safety, possible work accidents and occupational diseases in terms of healthcare management. These are essential steps to protect the health of fishermen.

Conflict of Interest

The authors declare that there is not any conflict of interests regarding the publication of this manuscript.

Acknowledgments

This study was carried out with the financial support of Van YYU BAP (Project No: SBA-2022-9852) entitled "Evaluation of Van Province Fishing Vessels in terms of Occupational Health and Safety". The authors are grateful to commercial fishermen for their valuable contributions.

References

- Asyalı, E., and Kızkapan, T. 2012. Maritime accident analysis at Turkish coastal waters in 2004-2008 including ships on international voyage. Dokuz Eylul University Maritime Faculty Journal, 4(2): 27–45.
- Atay, G., and Cengiz, Ö.2022. Investigation of fishing activities in Çitören (Van, Türkiye) for occupational health and safety. Marine and Life Sciences, 4(2): 137–141.
- Cengiz, Ö. 2022. Analysis of risk factors in fishing activities in Lake Erçek (Van, Turkey) for occupational health and safety. Momona Ethiopian Journal of Science, 14(2): 139–148.
- Çağlayan, Y., and Kılınç, A. 2005. İş Güvenliği, İstanbul, Milli Eğitim Bakanlığı Devlet Kitapları Müdürlüğü 2.Baskı, ss.1. (in Turkish)

- 148 A Risk Assessment on Occupational Health and Safety in fishing activities in Gevaş District (Van, Türkiye)
- FAO. 2001. Safety at sea as an integral part of fisheries management. FAO Fisheries Circular No. 966.
- İşler, M.C. 2013. İş Sağlığı ve Güvenliği Eğitimleri ile Güvenlik Kültürünün İş Kazası ve Meslek Hastalıklarının Önlenmesindeki Etkisi. T.C. Çalışma ve Sosyal Güvenlik Bakanlığı. İş Teftiş Kurulu Başkanlığı İş Müfettişi Yardımcılığı Etüdü. Ankara. (in Turkish)
- Jensen, O. C. C., Petursdottir, G., Holmen, I. M., Abrahamsen, A., and Lincoln, J. A. 2014. A review of fatal accident incidence rate trends in fishing. International Maritime Health, 65(2): 47–52.
- Köse, A., and Erdoğan Sağlam, N. 2023. Occupational health and safety on small scale fishing boats in Ordu Province. Journal of Anatolian Environmental and Animal Sciences, 8(1): 124–131.
- Özkılıç, Ö. 2005. İş sağlığı ve güvenliği yönetim sistemleri ve risk değerlendirme metodolojileri. TİSK Yayınları. 220 s. (in Turkish).
- Roberts, S. E. 2004. Occupational mortality in British commercial fishing, 1976-95. Occupational and Environmental Medicine, 61(1): 16–23.
- Soykan, O. 2018. Risk assessment in industrial fishing vessels by L type matrix method and its usability. Ege Journal of Fisheries and Aquatic Sciences, 35(2): 207–217.
- Tantoğlu, G. 2016. Balıkçı gemilerinde yapılan çalışmaların iş sağlığı ve güvenliği yönünden değerlendirilmesi (İş Sağlığı ve Güvenliği Uzmanlık Tezi). T.C.Çalışma ve Sosyal Güvenlik Bakanlığı, İş Sağlığı ve Güvenliği Genel Müdürlüğü, Ankara. (in Turkish).