

Review Article

Occupational Health Hazard and Safety Assessment of Fishermen Community in Coastal Zone of Bangladesh

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Abstract: This study was undertaken to assess the occupational health hazard and safety of Boga fishermen community in Kachua Upazila of Bagerhat district. All types of primary data and information were collected through household questionnaire survey, group discussion and local leader interview. Published journal paper, conference paper, books and news article are the secondary data sources for the research. Tropical cyclone is the severe most hazards during fishing because it acts like extreme life threatening event in the deep sea. The study finds that they face some physical problems during fishing like dizziness, vomit, fever, abdominal pain, acidity and dehydration. Traditionally they are practicing a few safety measures like carrying medicine for temporary health problems and carrying lifebuoy, life jacket, raincoat etcetera for ensuring protection from natural hazards which are not sufficient according to their occupation. Majority of the total fishermen did not take any training program ever on their occupational activities where only minority of fishermen have taken by the Upazila fisheries office. The Government and different NGO of Bangladesh are trying to help the fishermen community for their health safety but it is not well enough for enhancing their health safety. The knowledge gap of the fishermen and insufficient material support are the main constraints for their health/life safety.

Keywords: Health Hazards, Risk Assessment, Safety Assessment, Fishermen Community, Bangladesh

1. Introduction

Fisheries support the livelihoods of over half a billion people globally [13]. It is projected that about 25-27 million people in the developing world are engaged as fulltime and part-time small-scale fishers and another 60-70 million people contain in post-harvest activities [4]. Fishing is considered one of the oldest occupations around the world [20] and most probably, it is the most dangerous profession with high risk of occupational hazards or endemic diseases globally [10, 18]. Fishing has been prominent as an

occupation with a high risk of occupational hazards especially traumatic injury since 1713 [14]. The people who are affected by the accidents at sea, maximum are often among the poorest in the society. FAO estimates that roughly 4 million fishing vessels operating in capture fisheries, 1.3 million decked vessels, 30 million fishermen are working aboard and 2.7 million undecked vessels. It is also estimated that fatality rate is predicted to be 80 per 100,000 of worlds' fishermen workers per year [5]. The number of global

fatalities may be considerably increased day by day due to its unsafe working conditions and different types of natural hazards [9, 12]. Their working environment are not comfortable as they have to stay for long trips at sea on the board of the vessel staying at open air [7, 15]. Other factors that could impair safety in workforce include isolated locations, days with little rest, exposure to cold, rough seas, substantial participation of physical effort, equipment failure, constant economic pressure and everyday psychological stress. All these factors may increase the risk of health hazards symptoms in fishermen [14, 16, 3].

The coastal and offshore waters of the Bay of Bengal support numerous fisheries which have a great socio-economic importance to the bordering countries [17]. Riverine capture fisheries in the form of mutual property and open access resources create a vital component of the agro-ecosystem of Bangladesh. The marine and coastal capture fisheries segment of Bangladesh is the only primary foundation of income and nutrition for over 484,000 households and 2.7 million family members in the coastal region of Bangladesh [19]. During the last era fish moorings from the region has increased by over 60%. The latest statistics indicating catches beyond 3.7 million tons where more than 300 fish species are projected to be of commercial value [5]. Accessible statistics for countries with significant commercial fisheries specify that fishing occupational fatalities and injuries occur at rates much higher than national averages for occupational fatalities and injuries [8].

Near about 12 million people directly or indirectly depend on fisheries sector for their income generation activities [6] and in the mid-1990s fisheries sector contributed about 10% of total export earnings of Bangladesh [2]. This study selected the Boga community under Bagerhat district and it is found that they go for fishing in the deep sea as like as other fishing community in the coastal belt of Bangladesh. They all take their life risk for fishing and few often they face trouble for the natural hazards as well as anthropogenic hazards. In this study tried to explore about the fishermen of Boga communities living condition and health safety of the fishermen. Though there is no universal solution for fishermen health safety and security, but adopting certain safety measures can prevent fishermen from adverse health effect on the job [1, 11]. The main objectives of this study are to found out the health hazards of fisherman community and also to assess the condition of safety measures in case of health hazards among the coastal fishermen community in the coastal belt of Bangladesh.

2. Methodology

This research is conducted mainly by the primary database collected from community people and it's basically the qualitative type of research. Within the fishing community a total number of 40 respondents were selected randomly for household data collection. The community people of the study area are basically depends on fishing for livelihood. So,

random selection was took place instead of judgmental or any other sample determination method. To find out the required data for research work a semi-structured questionnaire format was developed considering the fishing community and their living status. From the fishing community leaders a good number of information about the occupation related risks was collected which was not clearly given by the respondents. The local leaders act like key informant and they were interviewed for data accumulation and cooperation of the research. Focus Group Discussions (FGDs) was a strong way of data collection for this type of study. Total two (2) FGDs were conducted for this research in the fishing community of Kachua Upazila and the focus group discussions were much helpful to accumulate clearer information on fishing occupation and the health risks of this occupation. Semi-structured questionnaire was also used for focus group discussion tool of primary data collection in the study area. Secondary data was collected from different internet sources like, journal paper, conference paper, news articles, published books etc. Before visiting the study location and collecting primary data, secondary data was collected and reviewed with deep concentration for understanding the clear concept of the research. Previously conducted researches helped to identify the risks of the fishermen and to compare with this research. After finishing the data collection procedure all types of data entered into Microsoft Excel Sheet 2010. Then analyzed the data and draw a result line. After that, wrote a report paper by representing image, diagram, table and textual form.

3. Results and Discussions

3.1. Socio-Demographic Characteristics

Table 1 shows fishermen community socio-demographic characteristics and occupational data. This study found that the family size of Boga fishermen community is divided into three basic categories according the number. Among them 50 percent fishermen have small family (2-4), 30 percent fishermen have medium family (5-6) and 20 percent fishermen have large family (7-10). It represents that near about 80 percent family are nuclear family and about 20 percent family are joint-family. On an average the study region contains 4 people in a nuclear family where 1 member is earning member. On the other portion, a joint family consists by 8 people in an average rate of the fishermen community where 3 people are earning member. 95 percent people of the study area depend on fishing for their livelihood, 2.5 percent are dependent on small business and other 2.5 percent people are dependent on agricultural farming. Basically the fishermen of the study area go for fishing in deep sea all the year round. On the other hand 7.5 percent of the total fishermen go 3 times for fishing per year. Most people go for fishing 2 times a year and they are near about 77.5 percent. Among the total fishermen 10 percent go for 1 time in a year there also have 5 percent of people don't go for fishing.

Table 1. Frequency distribution of some socio-demographic and occupational data of fishermen respondents.

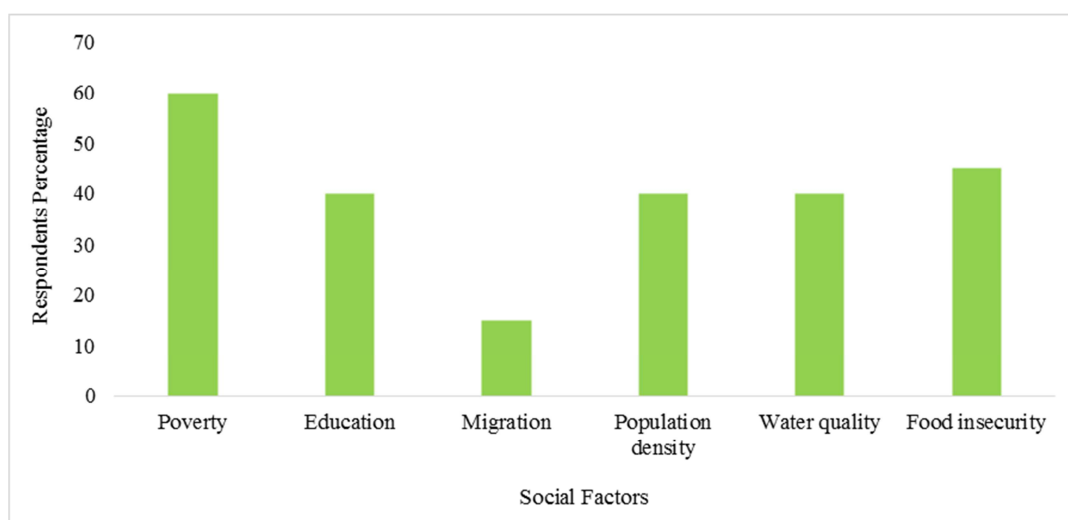
Socio-demographic characteristics	Total number of fisherman respondents	Frequency	Percentage (%)
Family Size and Types:			
• Small Family (2-4)	40	20	50
• Medium Family (5-6)		12	30
• Large Family (7-10)		08	20
Family Earning Members:			
• 0-1member	40	27	68
• 2-3 member		11	27
• ≤ 4 member		2	5
Marital Status			
• Married	40	30	75
• Unmarried		10	25
Livelihood Options:			
• Fishing	40	35	88
• Small Business		3	7
• Farming		2	5
Frequency to go for fishing per year:			
• Three times	40	3	7
• Two times		31	78
• One time		4	10
• Don't go for fishing		2	5

3.2. Occupational Health Hazards

Social Factors

During the focus group discussion, most of the respondents mentioned that poverty (60 percent) is the main cause which increase health problem. The estimation results show that lack of education facilities are identified as a key factor determining the incidence of health problem for fishermen community. The estimated impact of population density (40 percent) causes different kinds of diseases such as fever and ARI etc. Household environmental conditions such as water

quality are identified as an important factor and the study found that around 40 percent respondents are extremely vulnerable due to pure drinking water and it increases their disease. Food security (45 percent) is the major cause for increasing health problem in the study area. Figure 1 shows that majority of the respondents are living extremely poverty condition and during off season of fishing, their source of income were not well enough to support his family or himself. As a result they eat two or one meals in a day and it turned them to different health hazards

**Figure 1.** Social factors impact on health.

Natural Hazards during Fishing

The fishermen of Boga community face mainly tropical cyclone during fishing basically in rainy season. Without that they also face ocean storm and heavy rainfall which can hamper their daily activities or can create health/life risks. In

the rainy season the risks of fishermen life is extremely high compared to the winter season. Figure 2 shows that high frequency and intensity of tropical cyclone creates severe live and livelihood threats for the fishing community. About 56 percent fishermen said that they have faced severe cyclonic

event during fishing where 22 percent have faced sudden ocean storm caused by the deep ocean depression.

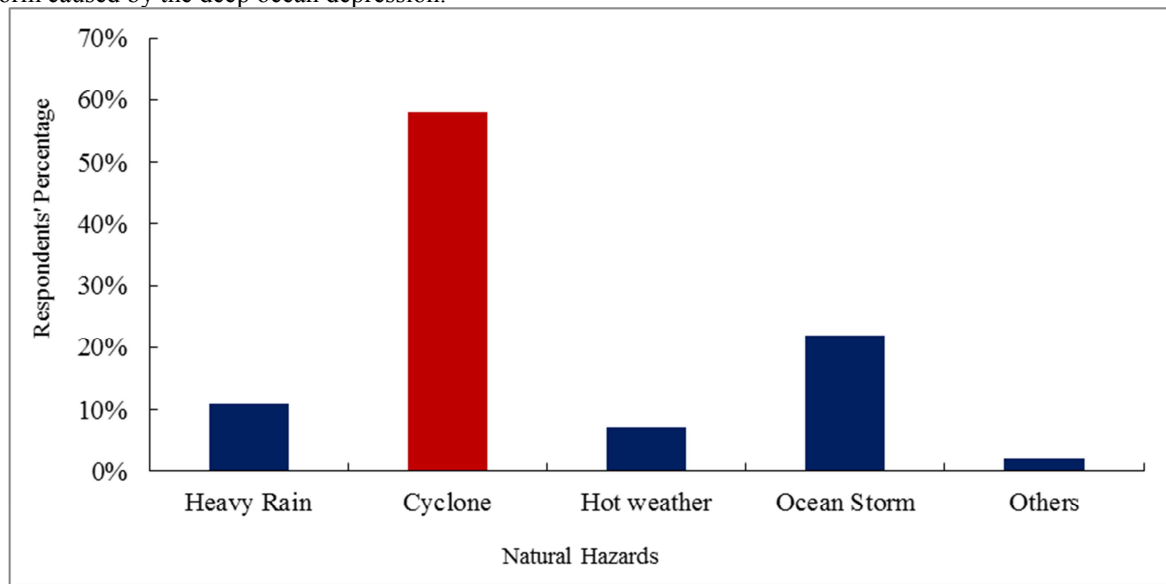


Figure 2. Natural hazards face during fishing.

From the key respondent of the community it is clear that the maximum life loss occurred previously during fishing activities due to tropical cyclone. Figure 3 shows that in the last year severe life loss occurred into the community due to cyclone. One respondent named Ali Akbar Hawlader (Local Leader) faced the cyclone and describes that night with full of

frightening face. He said, “*One fishing boat was fallen before my eyes, but I had nothing to do for the fishermen of the boat.*” According to the community leader life loss is a common and continuous event for the fishing community in every year because of natural hazards.

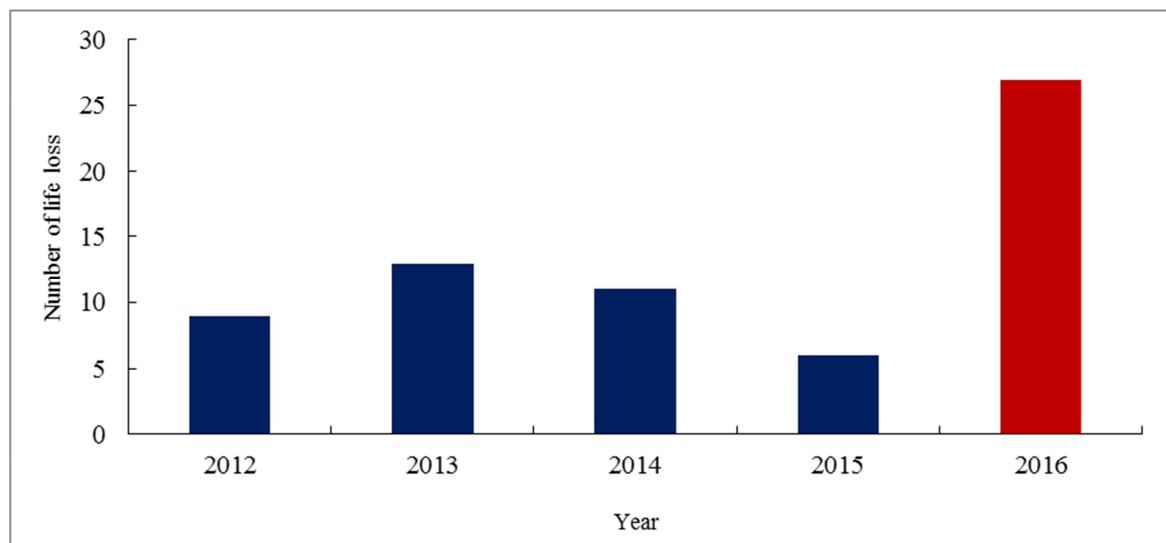


Figure 3. Life loss due to tropical cyclone during fishing.

Physical Hazards during Fishing

Fishing is an occupation where the fishermen have to stay in the sea water during a long time and it's not so easy to survive as like as land part. In the time of fishing they fell various health problems. Figure 4 discuss about the represent the problems of fisherman and from the figure it is clear that 75 percent of the total fishermen face dizziness in time of fishing because of the ocean waves. 70 percent of the total fishermen fells vomit and it occurs by the same reason of ocean waves

come again, again and again and the fishing boat started to swing. 55 percent of the total fishermen face fever also during fishing and could occur due to the all-time direct contact with ocean and rain water. 33 percent of total fishermen face acidity problem because of the food habit at first during fishing. 25 percent of the total fishermen face abdominal pain, 30 percent of total fishermen face diarrhea and 10 percent of total fishermen fell the dehydration problem.

Anthropogenic Hazards during Fishing

During the fishing hour human made hazard faced by fishermen in the deep sea which is pirates attack. They could come from anywhere and anytime in the fishing area and do robbery activities to fishing boat. They also take fishermen with them and stuck with demanding a huge amount of ransom and without that the pirates also kill fishermen with any reason.

So, this is an additional event of hazard for the fishermen because they usually face many natural hazards and they could be expected not to anything from other human being. But it occurs even more furiously than weather hazard when the pirates do robbery and kill the fishermen.

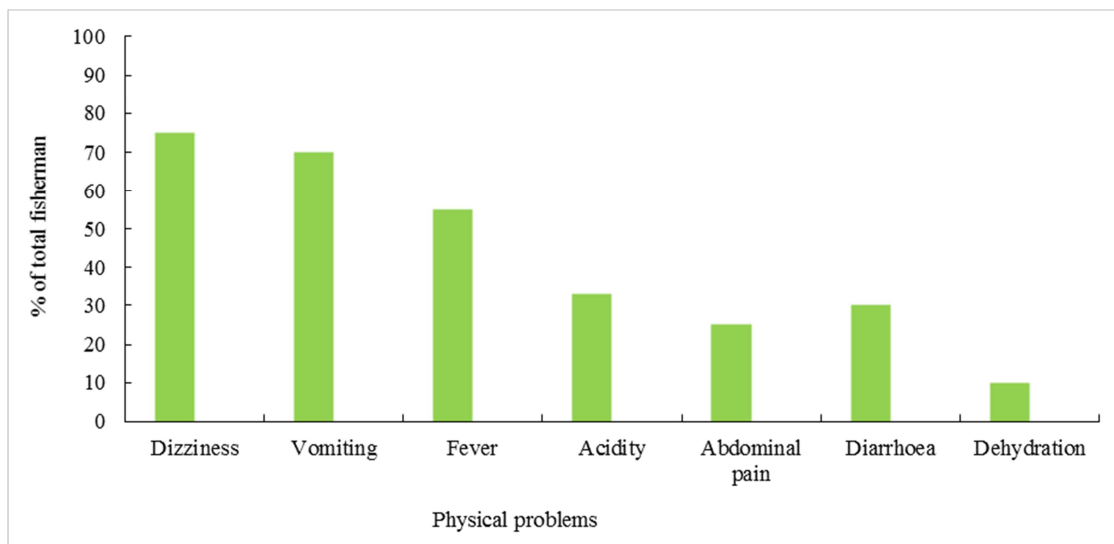


Figure 4. Health problems face during fishing.

Physical Hazards after Fishing

The fishermen of the study area are facing a long term health effect due to their occupation. The fishermen respondents have felt some physical problems after arriving their home. About 90 percent of the total fishermen said that they have felt eye problem often after arriving. The main causes of reducing the visualization power of eyes is using saline water during fishing and direct contact of raindrop into

the eyes. On the other hand, cataract problem also occur in several cases. Red eye problem, irritation, watering, sensitivity, visual impairment, reduce vision etc. are the common eye problem. 85 percent of the total fishermen mentioned that after arriving 1/2 days, they feel dizziness and 88 percent of the total fishermen feel vomiting tendency. Figure 5 shows the thing clearly condition of physical problem which they faced.

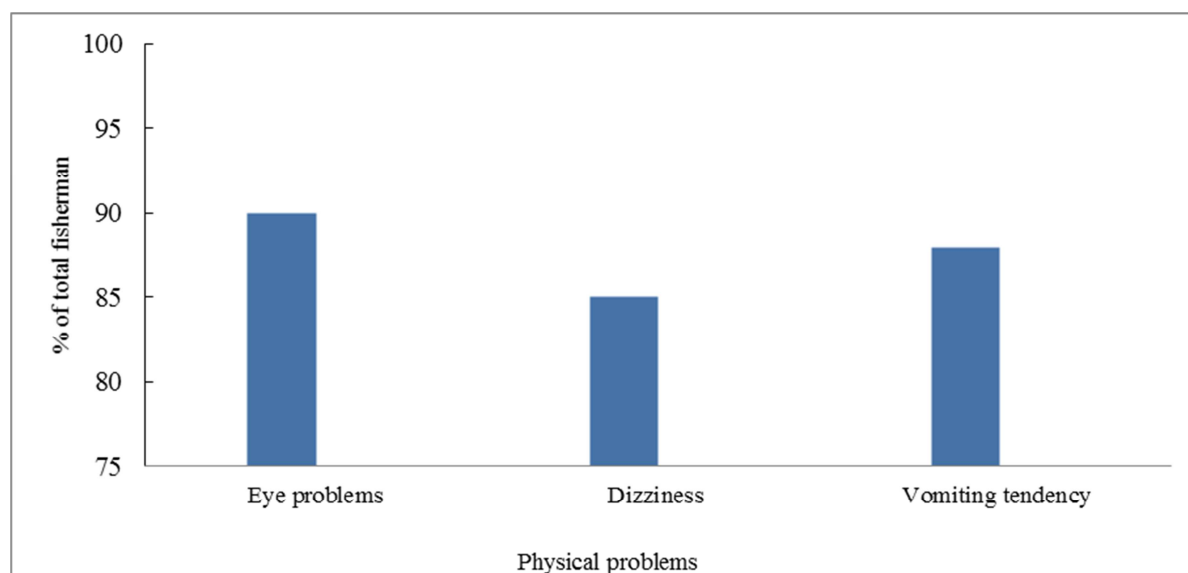


Figure 5. Physical problems face after arriving home.

Frequency of Health Hazards

The study found that the fishermen had a higher frequency of different health hazards. About 75 percent of fishermen

respondents had musculoskeletal complaints during the 12 month, where 37.25 percent suffered from severe stress. More than 80 percent of the fishermen exposed to accidents during

their work, 55 percent of them reported injuries during these accidents. 25 percent of fishermen suffered from auditory complaints and more than 45 percent of the fishermen exposed

to sunburn during working on the board of the boat (Table 2).

Table 2. Frequency distribution of health problems among fishermen communities.

Health problems	Frequency Fisherman	Percentage
Musculoskeletal complaints	30	75.00
Stress level:		
Mild to moderate	15	37.25
Severe	27	67.50
Exposure to accidents during work	32	80.00
Injuries due to accidents	22	55.00
Auditory complaints	10	25.00
Exposure to sunburn during work	18	45.00

Noise Problems

Noise problem is considered another hazards of fishermen communities and the study found that 25 percent of fishermen were exposed to mean sound level in the engine room, 37 percent exposed to 90 dB on board of boats <39 HP and 20 percent exposed on non-maintained boats of 104 dB (Figure 6)

for mean working times exceeding occupational safety and health administration. On the other hand, there is no risk for fishermen working on board of boats >39 HP (18 percent) as they were exposed to mean sound level of 77 dB which according to OSHA PEL has no time limits.

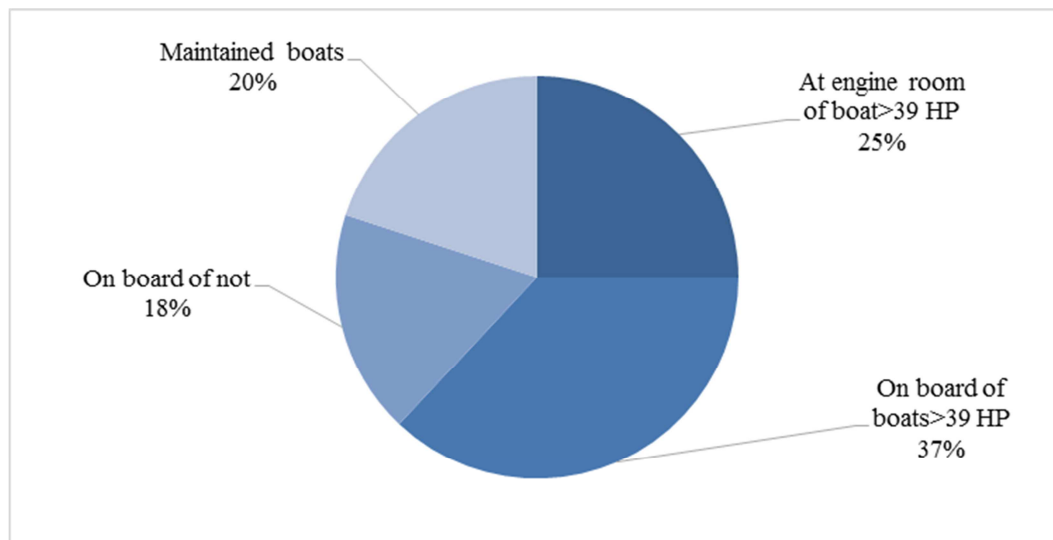


Figure 6. Level of noise exposure on different boats among fisherman.

Causes of Fatalities

The fishermen were asked to main causes of fatal incidents (Figure 7) which occurred over 15 period and resulted in 30 in fishermen losing their lives due to the vessel taking on water or capsizing and then sinking. The most important causes of fatalities was entanglement in nets or other gear and being dragged overboard. The fishermen mentioned that they were wearing no form of personal floatation devices. This made their recovery from the water slow and turned them to the quick death though the search and rescue operation were active. And these cases, no dead bodies were ever recovered

from the sea. It's the question arise after knowing the overall vulnerable situation of their occupation that's why they do not choose other occupation, where they can live without risk free life. The fishermen of the community argued that and give their opinion about the reason which is given bellow in table 03. The main reason from their opinion is to earn lots of money in few days. In other way they said that it's their tradition to choose the occupation. Finally they said an interesting reason not to choose other occupation, after a certain season of fishing the occupation turns to an addiction.

Table 3. Fishermen opinion(s) about their occupational stability.

Respondent	The reason(s) they don't choose other occupation
	It's the tradition to take this occupation.

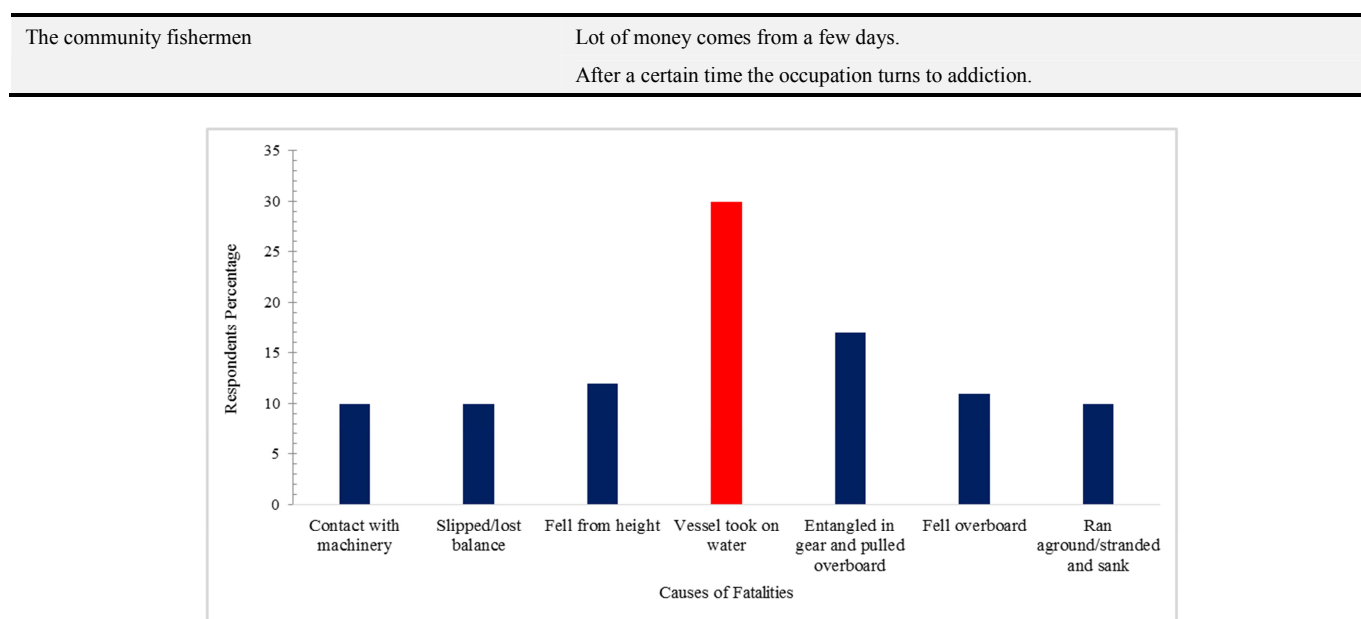


Figure 7. Causes of fatalities of fishermen communities.

3.3. Occupational Health Safety

People were asked about their choices which strategy they followed to cope with health hazards for himself or for his family, 55 percent of the participants mentioned that applied local indigenous knowledge and experience were the first strategies they used in treating health related problems. On the contrary, 45 percent of the respondents sought any treatment by qualified, unqualified providers as their first option. Unqualified providers are those who are residing their village, known to them, they open for whole day, people trust him and people could negotiate their payment and buy medicine in his own dispensary. The use of qualified providers (health services at Upazila Health Complex) was low compared to unqualified providers. The reason behind the problem found that the respondents are not sure if they will get proper what they needed. Again they also revealed that there is no medicine supply, no doctor and no treatment. Sometimes with the concern of the Upazila medical officer, fishermen make storage of medicine (20 percent) for the emergency health condition into their fishing boat. They normally store Paracetamol, Napa-extra, Seclo, Ranitidine, Amodis, Anti-biotic, oral saline etcetera for the protection of temporary health problems. Around 22.5 percent of the total respondent select the first choice of training and some fishermen told that they did not take any training ever which they required. But

another 15 percent said that they have taken training about the occupational safety from Upazila fisheries officer which was their second choice (Table 4). It's a very poor number who have taken training and remind the outline of that training.

The engine used in the fishing boat is with three cylinders and 39 Horse Power which is well enough powerful. If anyone of the three cylinders becomes fail then the two others have enough power to run the boat. So, it's a physical capacity of fishing boat for fishermen life safety. 47.5 percent of the respondents mentioned that they have a professional machine mechanic and only the maintenance of engine is his duty during fishing. 52.5 percent fishermen discussed that before starting the journey for fishing, all the fishing teams take their final preparation for ensuring health safety. They take life jacket, lifebuoy, raincoat for boatman, extra fishing net ball etc. which can support them if necessary in any lifesaving situation. But the study found that their ultimate health safety condition is poor in case of any natural climatic shocks. Though they take a radio for regular update and forecasting of weather news, in case of sudden disasters, they did not capable in doing of anything. If the oceanic storm starts at night then the fishermen become helpless. Most often they have to stop the engine at night during disaster and wait for the morning to move on towards the coastline or safer area.

Table 4. Occupational Health Safety strategies by the fishermen community.

Health coping strategies by the survey participants	1 st choice		2 nd choice		3 rd choice	
	Yes		Yes		Yes	
	n	%	n	%	n	%
Applied local indigenous knowledge and experience	22	55.00	10	25	8	20.00
Sought treatment (qualified/unqualified treatment)	18	45.00	13	32.50	9	22.50
Storage Medicine	8	20.00	9	22.50	0	00.00
Training	9	22.50	11	27.50	6	15.00
Increasing capacity of fishing Boat	19	47.50	12	30.00	9	22.50
Sea survival	21	52.50	9	22.50	10	25.00

First Aid	10	25.00	11	27.50	9	22.50
Health and Safety Awareness	11	27.50	9	22.50	20	50.00
Did nothing	7	17.50	11	27.50	22	55.00

*n=number

Support Provided by Government and Non-Government Organization

From the presentation of Figure 8, the Government support for the fishermen community is clearly noticed. Life jacket (35 percent), lifebuoy (22 percent), GPS tracker (10 percent), telescope (8 percent) support are provided only for the reason

of safety for fishermen. Teletalk network coverage (25 percent) is an important support which is provided by the government (Figure 8). Teletalk mobile company cover the network of whole fishing area and fishermen can get any information easily without interrupting the bad network or adverse condition.

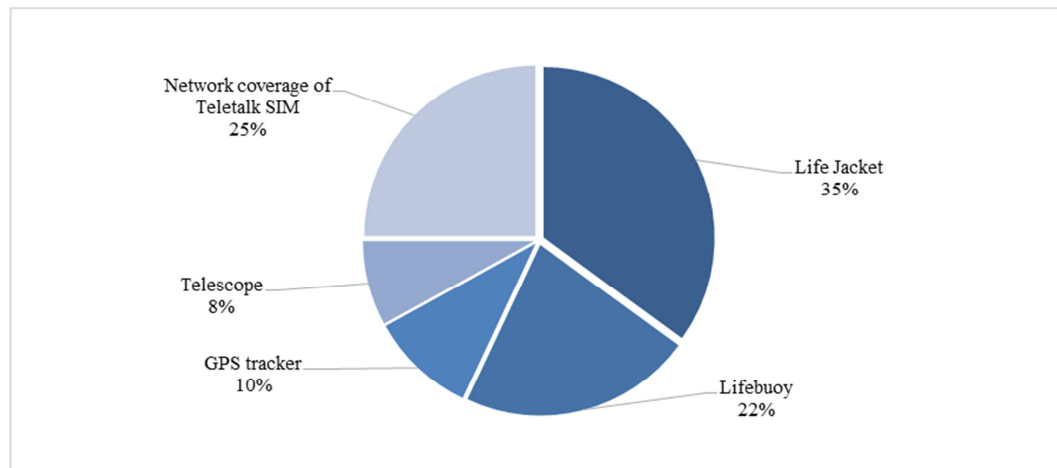


Figure 8. Support provided by Government Organization.

Non-Government Organization (NGO)

The fishermen community of the study area did not get any significant support for their life and livelihood. But in recent year, they are getting started to provide from different NGO such as net-boat support. Figure 9 shows that the fishermen were got 80 kilogram of fishing net (40 percent) and with due consideration a few poor fishermen get fishing boat (30 percent). The fishermen also developed their knowledge through trainings (10 percent) and it enhanced their awareness level on health safe. Facing cyclone and ocean storm is a common feature for the fishing community during fishing. Previously the higher number of life loss occurred by the tropical cyclone comparatively than the others at fishing hour. On another side, the fishing team members face several

physical problems due to the fishing environment. But natural disaster like cyclone is the most life threatening event for the fishermen. In recent time they face long term health impacts due to their occupation. Day by day the duration of working efficiency is reducing slowly because of the degradation of health stability. They are practicing some safety strategies which are the basic requirement for their occupation. But that's all are not sufficient for their health and life security. It's a matter of fact that the fishermen need more effective support from GOs and NGOs. They throw their life into severe risky condition for fishing and hold the fish supply trend according the country wise demand. So, ensuring the safety of life is their right.

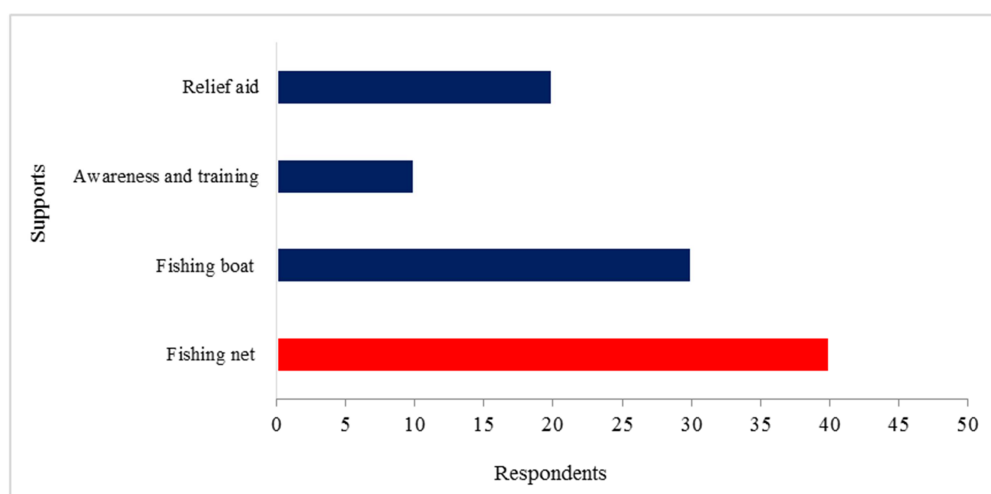


Figure 9. Support provided by Non-Government Organization.

4. Conclusion and Recommendation

The fisherman community of the study location is fully depends on fishing activities for their livelihood. During each year they go for fishing in the Bay of Bengal mostly for two times on the basis of rainy season and dry season. Each fishing team faces natural hazards commonly like tropical cyclone in the rainy season and faces anthropogenic hazard like pirates attack in the dry season. Day by day the frequency of the cyclone formation is increasing in the deep sea which is an alarming issue for the fishermen. After facing different natural hazards and health problems they feel long term impacts which reduce their working efficiency after certain age. They carry a few medicines, life supporting events for temporary health protection but have nothing for pirates attack. Even the maximum fishermen did not take any training on their occupation which increases their life threat during fishing. They don't know any alternate or new way of protection from different hazards or disasters without the traditional one because of the knowledge gap. Still now they don't have any immediate safety measures to securing themselves from cyclone or sudden ocean storm without the warning message from radio. The main recommendation for the study is-
-For the emergency rescue of fishermen at the time of disaster strike sea plane service is available for the Indian fishermen from their government. The government of Bangladesh should think about such kind of service and applies for securing the life of coastal fishermen.

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