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Injuries to Fishermen in Tanji, The Gambia

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Abstract: ***The aim of this study was to assess the injuries to coastal fishermen in Tanji Fishing Centre during fishing process. The fishermen were interviewed with the aid of structured questionnaire and checklist. Responses were analyzed using SPSS version 25 descriptive statistics. Eighty-nine percent of the fishermen were injured during fishing in the last twelve months before the study. Cuts were reported by 69% of the fishermen, 44% reported being bruised, 41% indicated itches and scratches, and 25% reported sprain and/or strain. Fatal injuries were due to drowning. Further research on the injuries to coastal fishermen in The Gambia is necessary.***

Keywords: Injuries, Fishermen, The Gambia

1. Introduction

Very high fatal and nonfatal injury rates have been reported to occur among fishermen at sea, despite the industry accounting for less than one percent of the worldwide workforce [1]. In the Nordic countries, fatality rates among fishermen are between 90 and 150 per 100, 000 yearly, despite the fact that the injury prevention, survival training, and search and rescue services offered in these countries are among the best in the world [2]. In West Africa, these figures are even higher [1],[3]. In 2010, The FAO conducted a study entitled, "*Safety at Sea for Small-scale Fisheries in Developing Countries"* in seven coastal countries in West Africa including The Gambia. This study showed that artisanal canoe fatality rates are in the range of 300 to 1,000 per 100,000 fishermen [4]. From 2008 to 2009, there was a recorded increase in the number of incidents and in the number of deaths of fishermen in West Africa which is most likely due to more efficient data collection methods and an increase in the reporting of the incidents [4].

Studies have shown that about 50% of incidents during fishing include human casualties [5]. Other studies have also reported as many as 24 million nonfatal injuries occurring among fishermen each year worldwide [1],[6]. Although the occupational and environmental hazards exposures associated with fishing in Tanji, The Gambia have been highlighted by Camara et. al., (2018) [7], published data on injuries to coastal fishermen in The Gambia where fishing is a major industry is scanty. Lack of adequate knowledge on the nature of fatal and nonfatal injuries may hinder efforts in prevention of the injuries. Therefore, effective prevention measures must among other things rely on scientific knowledge of the various hazards that fishermen are exposed to and the resultant injuries at work. The aim of this study was to characterize the various types of fatal and nonfatal injuries that occur among fishermen in Tanji during their fishing operations.

2. Materials and Methods

A descriptive cross-sectional survey was implemented on fishermen in Tanji Coastal Fishing Center who go to The Atlantic Ocean for fishing operations. A pretested structured questionnaire and checklist were used to collect data from the coastal fishermen. The questionnaire included questions on sociodemographic data of the study participants that was partly adapted from Camara, et. al., (2018). The checklist was in two parts. Part one included questions on nonfatal injuries among fishermen while fishing during the last twelve months. The questions from this part were adapted from Rex, et al., (2006a) [8]. They gathered information on the injury occurrences, their nature, severity, mechanism of, and treatment during fishing. Part two: included questions on fatal injuries to coastal fishermen while fishing during the last twelve months. This part, also sought information on the deaths and boat incidents leading to fatal injury at sea while fishing.

2.1 Study area and population

Tanji Fishing Center is one of the seven major coastal artisanal fishing centers in the country [9]. It is located at Tanji Village in the Kombo South District of The Gambia. The center is both a landing site and a market for fish. The fishermen in this landing site work in specific boats of different sizes; however, they are similar in nature. The study participants were selected from those fishermen who last crew up for fishing not more than one week before data collection began. The country is made up of a population of about 2 million people. Fisheries are the third largest contributor to the Gambian economy after land agriculture and tourism. It provides livelihood to about 200,000 (two hundred thousand) people and earns an appreciable amount of foreign exchange for the country [12]. Fishing provides direct employment to about 40,000 people from the industrial and artisanal sectors [12]. The majority of this figure are from the artisanal sector [9].

2.2 Sampling

Study participants were selected using 2-degree probability random sampling method. At first, 36 boats that were actively used for fishing at the time were selected at random. Second, for each boat, simple random sampling was used to select one (1) participant. Thirty-six fishermen participated in the study. The names of the fishermen in each boat were obtained from the head fishermen. From these names simple random sampling was done to obtain the participants to the study.

2.3 Data management

Interviewers came from Gambia College School of Public Health. They were trained on the questionnaire and the checklist. The data collection process was through one-to-one in person interview. The collected data were computerized on SPSS version 25 [10]. The data was analyzed using SPSS Program version 25 descriptive statistical analysis [10].

2.4 Ethical and Consent Processes

This study was reviewed by the RePubliC (Research and Publication Committee) of the University of The Gambia and final approval was given by The Gambia Government/Medical Research Council Ethics Committee (RO15-015V2). Consent was also obtained from of the fishing center authorities and the fishermen.

3. Results

3.1 Socio-demographic information

All of the participants were male who fish all year round. Their ages ranged 24 years, with a mean age of 48 ±11 years. Seventy-two percent of the fishermen had some form of schooling. All the fishermen used planked canoes that were powered by out-board engines. Sixty-seven percent of the out-board engines were either 15 or 40 Horse Power. Seventy-two percent of the fishermen used canoes with lengths of between 10 and 20 meters. Sixty-seven percent of the crew sizes of the fishermen were 10 or less people per fishing trip. **Table 1** shows that 38% of the fishermen had at least 25 years work experience and the rest had at least 10 years of work experience. The commonest gear used for catching fish was fishing net (50% of the fishermen used it). The most targeted fish species is *bonga*. Other targeted fish species include barracuda, snipper, grouper, shark, cat fish, sole fish, shad, and octopus among others. Forty-three percent reported owning the canoe they use for fishing. More than half (56%) of the fishermen work as family members. The different tasks during fishing included skipper, deckhand, mate, and mechanic. A little over 16% (n=6) of the fishermen reported belonging to association specific to fishing. Eighty-three percent (83%) of the fishermen travelled a distance of twenty-five kilometers (13.51 Nautical Mile) or more into sea to catch fish carrying combustible materials such as extra petrol, charcoal in their planked canoes while fishing. However, more than 75% of the fishermen go to sea with neither fire extinguishers nor first aid boxes onboard. Majority of them use more than one stimulant during fishing. The stimulants used were tobacco, coffee, china green tea, and a local type known as *café touba*.

Table 1: Sociodemographic features of the fishermen

Sociodemographic features		Number of fishermen (n= 36)	
		No.	%
Nationality	Gambian	18	50.0
	Non Gambian	18	50.0
Age (years)	≤40	20	55.5
	>40	16	44.5
Marital status	Married	20	55.6
	Single	14	38.9
	Divorced	2	5.6
Literacy	Read only	2	5.5
	Read and write	26	72
	Neither read nor write	8	22.5
Smoking status	Smoker	22	61.1
	Non-smoker	14	38.9
Length of fishing experience in years	10 to 14 years	8	22.2
	15 to 19 years	10	27.8
	20 to 24 years	4	11.1
	25 years and above	14	38.9
Average time spent in water per fishing trip	2 to 8 days	4	11.1
	5 to 18 hours	32	88.9
Whether fisherman ever received safety training	Yes	14	39.0
	No	22	61.0

Reported injury characteristics of the fishermen

Most fishermen (89%) indicated that they were injured while fishing during the last twelve months. Penetrating wounds, bruises, itches and scratches, and musculoskeletal disorders were the most common injury types among the fishermen – **Table 2**. Seventy-five percent of the fishermen reported that the open wounds are likely infected. The body parts that were mostly injured were the hand, the palm, the finger, and/or the wrist (89%) while the ankle, the foot, and/or the toe (11%) were the least injured body parts during fishing. Fishermen got injured during different activities ranging from loading fishing gears on canoe, pushing canoe into sea, controlling engine, walking on walkways, setting fishing nets, removing the catch from fishing nets, separating the catch, transporting the catch, unhooking fish, to pushing canoe upland. The fishermen were mostly standing upright when they got injured. Fishing gear and fish were the commonest injury agents associated to the injuries, as the two were implicated for almost all of the injuries. The perceived contributing factors to the injuries were 60% associated with human factor – not concentrating, drunkenness, carelessness, non-use of PPE among others.

Self-treatment immediately after an injury was common among the fishermen and many of them used petrol and sea water to treat their wounds. About 75% of the injured fishermen sought healthcare elsewhere at a later time. Of those who sought healthcare, 33% did so from a pharmacy outlet. The duration of treatment among the on-the-job injured fishermen ranged from 2 days to 90 days. About 59% of injured fishermen stayed out of job due to injury and the number of working days lost due to injury ranged from one day to one hundred and twenty days in a calendar year. Some 81% of the injured fishermen reported that their injury sustained during the last twelve months kept them out of work for at least 3 days, and at most 45 days. Eighty- three percent (83%) of the fishermen complained of other health problems perceived to be related to fishing. These reported health problems included callus (61%), fatigue (28%), allergic reactions (25%), chest pain, hemorrhoid, visual impairment, walking difficulties, and backache among others.

Table 2: Fishermen reported nonfatal injury characteristics during the last 12months

Injury Characteristics	Number of fishermen (n=36)	
	No.	%
Injury types sustained		
Fish Bites	5	13.9
Bruise	16	44.4
Burn	4	11.1
Burning sensation of legs or arms	8	22.2
Chopping	3	8.3
Cut	25	69.4
Dislocation	2	5.5
Fracture	3	8.3
Itches and scratches	15	41.7
Joint pain	6	16.6
Numbness of legs or arms	8	22.2
Pulled muscle	2	5.5
Puncture	7	19.4
Scald	1	2.7
Sprain and strain	9	25.0
Stiff muscles	1	2.7
Stings	7	19.4
Body parts injured		
head/neck	5	13.9
shoulder/arm/elbow	9	25.0
chest/ribs/abdomen	5	13.9
back/waist	10	27.8
hips/legs/knees	13	36.1
ankles/feet/toes	4	11.1
hand/palm/fingers/wrist	32	88.9

Over 30% of the fishermen indicated that five or more other fishermen lost their lives while fishing during the last 12 months prior to the study – **Table 3**.

About 61% of the fishermen reported being ever involved in close to fatal incident during fishing and 11(31%) of them were involved in such incidents for at least five times. Canoe capsizes was the single most frequent reported incident to the fishermen 15 (42%) and other incident types included collision, grounding, and engine problem. Some fishermen were involved in more than one incident type.

Table 3: Fishermen reported incidents and fatal injury characteristics

Fatality and Incident Characteristics		Number of fishermen (n=36) No.	%
Incident frequency			
	1 time	9	25.0
	2 times	5	13.9
	3 times	5	13.9
	4 times	2	5.5
	≥5 times	11	30.5
Incident type that fishermen were involved in			
	Boat Grounding	6	16.7
	Boat Capsizing	15	41.7
	Engine problems	6	16.7
	Collision	8	22.2
	Others	2	5.5
One fisherman		5	13.9
Two fishermen		6	16.7
Three fishermen		6	16.7
Four fishermen		4	11.1
≥ five fishermen		11	30.5

Reported at-sea deaths of fishermen during the last twelve months

4. Discussions

This study described the fishing culture at Tanji landing site, The Gambia. While El-Saadawy, *et al.*, 2014 [11], reported that more than 80% of fishermen in Alexandria, Egypt are smokers, 61% of coastal fishermen in The Gambia smoke during fishing, yet the prevalence rate of smoking among fishermen is above the national average [12]. All the fishermen in this study use stimulants with majority of them (69%) using more than one stimulant. The single most commonly used stimulant was china green tea (86%) among others including tobacco, *café touba*, tea, and coffee. The *mare* fishermen brew china green tea while fishing. They claim that these stimulants help them to keep warm when temperatures are low at sea.

Fishermen learnt the job of fishing either by apprenticeship or inheritance, As reported by other studies in Africa [3],[11], more than half of the average crew sizes per fishing trip in Tanji is made up of ten people or less. The consistency may be the studied fishermen are mostly from the artisanal sector. The findings of this study are not different from conclusions of the Fisheries Framework survey of 2007 of the Government of The Gambia [14], where, the reported commonest fishing gears used by coastal fishermen in The Gambia are fishing nets, and hook and line, with about 50% of the fishermen using fishing net only. This study suggested that the most targeted fish species is *bonga fish* and so more than three quarters of the fishermen spend 5 to 18 hours from the time they leave the landing site to the time they land their catch. Unlike what was reported by El-Saadawy, *et al*., (2014) [11], most coastal fishermen in Tanji are less specialized on the job while fishing, as more than 69% of them reported having involved in more than one type of task on the canoe for a trip during fishing operations making the trade in The Gambia largely laborious. This study has also shown that fishermen do not under go any form of formal training. The use of life jacket and GPS device while fishing was widely reported. However, the lost rate among the fishermen was high – up to 89%. The contradiction could be explained by the low formal training among the fishermen.

Injuries: This study, as other similar studies around the world [3],[5],[11],[14], has shown that injuries – both fatal and nonfatal are common among coastal fishermen in Tanji. About 89% of the fishermen reported that they have at least sustained one nonfatal injury while fishing during the last twelve months. It was observed that injury rates were lowest among the skippers or captains. Eighty percent of the fishermen indicated that they sustained nonfatal injury at most 5 times while fishing during the last twelve months; and thirty-three percent indicated at least 6 times. Forty-eight percent of the fishermen indicated that they could not recall the number of times they sustained nonfatal injuries while fishing during the last twelve months. While the commonest injuries reported in this study are cuts and

punctures, Case, *et al*., 2015 [14], indicated fractures as commonest injury types. However, while Case *et al.*, (2015) did a record review, this study was a descriptive cross-sectional survey in nature.

Canoe incidents are common among coastal fishermen. Canoe capsizes account for about half of canoe incidents. The frequent canoe capsizes could be due largely to the relatively small size of planked canoes used by the fishermen as 83% of fishermen use canoes of lengths less than 20 meters. The use of life saving devices and personal protective equipment was low. Fishermen are continually exposed to sharp tools, harsh weather, and they fish at distances that are far from emergency care and rescue services. The fishermen do not have first aid kit boxes with them nor fire extinguishers. Similar findings were also indicated by Jeżewska, *et al.*, 2012 [15]. There was variation in the reported number of deaths at sea by the fishermen with some 30% reporting at least 5 deaths in the last twelve months preceding the survey. This variation is an indication of inconsistency due to inadequate surveillance system and services offered in the fisheries sector.

Self-treatment immediately after an injury was evident among the fishermen and many of them used petrol and sea water to treat their wounds. Most likely, as revealed by the study, because fishermen do not have any first aid material with them, they must resort to what was readily available with them that is petrol and sea water, to treat their wounds. The fishermen believe that petrol and sea water have healing effects. However, 75% of the fishermen indicated these wounds could become infected due to poor aseptic measures arising from self- treatment of the wounds. In such situations fishermen could stay out of work for days. About 25% of the injured fishermen did not seek healthcare elsewhere at a later time while the rest did could be an indication of the severity of the injuries at the time.

5. Conclusion

From this study, it is permissible to conclude that most coastal fishermen in Tanji are with low levels of education less than half of whom ever received any safety training and more. Nonfatal injuries are common among the fishermen in Tanji with commonest injury types being cuts and puncture wounds, and musculoskeletal disorders. The most notorious injury causing agents are working tools and fish. Drowning was the cause of all the fatal injuries. Injuries among the coastal fishermen in The Gambia look inevitable, yet, many dangers can be mitigated. Mandatory safety training for fishermen is first and foremost. This safety training should be an induction training and then continue while in the fishing sector.

Secondly, the fishermen should be encouraged to organize themselves in associations that are specific to fishing. Thirdly, other epidemiological methods including injury surveillance should be implored on the fishing sector for better understanding of issues around fishing in Coastal Gambia. Other health issues including visual impairment deserve close attention from the epidemiologic point of view and get policy makers and authorities informed appropriately.

Data Availability

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Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this paper.

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