Original Research Article

Selected non-communicable diseases and risk conditions among fishermen in Divisional Secretariat Division of Kalpitiya

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Abstract

Background

Fishermen are special group of people who are more vulnerable to non-communicable diseases due to occupation specific conditions.

Objective

To determine the prevalence of accidental injuries, hypertension, malnutrition, smoking and alcohol consumption among fishermen in Divisional Secretariat Division of Kalpitiya.

Methods

This was a descriptive cross-sectional study, conducted during the period of August to October 2011. The sample consisted of 465 fishermen with ≥6 months experience in fishing and selected by applying the cluster sampling technique. The study instruments were the interviewer-administered questionnaire and the record sheet. Prevalence of the above conditions and diseases with 95% confidence intervals (CI) were calculated.

Results

The prevalence of accidental injuries was 19.6%(95%CI:16%-23.2%). The prevalence of hypertension was 24.3%(95% CI:20.4%-28.2%) and it was significantly higher among those who have >10 years of service experience in the fishing sector ($p<0.01$) and history of smoking >10 years duration ($p<0.001$). The prevalence of underweight, overweight and obesity were 6.2%(95%CI:4%-8.4%), 20.6%(95%CI:16.9%-24.3%) and 2.6%(95%CI:1.2%-4%) respectively. The prevalence of current smokers and current alcohol consumers were 54.6%(95% CI: 50.2%-59%) and 60.2%(95% CI: 55.8%-64.6%) respectively.

Conclusion

The prevalence of hypertension, smoking and alcohol consumption were higher and obesity was lower among fishermen than general population. Improve the knowledge on prevention and screening are recommended.

Key words: alcohol, fishermen, hypertension, obesity, overweight, smoking

Introduction

Non communicable diseases (NCD) are rising with increasing threat to health sector. Fishermen are more vulnerable to NCD as majority of them have lifestyle risk factors (1).

Risks of health problems vary with the type of fishing operation, area of operation, vessel size, equipment carried and the job of each fisherman. When compared to small vessels, fishermen in larger vessels have higher risk of injury or death through crushing by heavy equipment. Bad weather, loss of power and unsuitable vessels are

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additional risks, which may be greater for small vessels than larger ones. Smaller vessels may be damaged or lost more easily by powerful storms or run down by merchant ships (2).

The International Labour Organization's (ILO) Occupational Safety and Health Branch estimates that fishing has a worldwide fatality rate of 80 per 100,000 workers or approximately 24,000 deaths per year, and estimates that there are 24 million non-fatal accidents in the sector annually (2). There is a great variety in fishing operations and also a great variety in the way health problems of fishermen are classified.

Kaerlev, L et al reported fishermen have high standardised incidence ratio for injuries compared to general population (3). Similarly Roberts SE reported the fatal accident rate among fishermen was 115 times greater than in the general British workforce (4). This study showed that commercial fishing is by far the most hazardous occupation in Britain (4). Another study had reported there were 60 workplace deaths and 574 hospitalized injuries among the fishermen during the period 1991-1998 (4). Casson et al reported fishermen had a higher prevalence of work injuries compared to a reference working group (6). The prevalence of the work related injuries among the fishermen was 38.6% in North Carolina (7). In many cases, the consequence of an accident is more severe when it happens in the sea than if it happened on land (8).

Kirkutis et al reported that the prevalence of hypertension among the Lithuanian seamen was 44.9% (9). Roberts SE reported that most of the deaths of fishermen were caused by cardio vascular diseases, and probably due to lifestyle risk factors as well as extremely hazardous and stressful working and sleeping conditions (1).

Fishermen have other risk conditions of NCDs like obesity due to high amount of fish intake with low priority to other nutrients especially in long voyages. The prevalence of the overweight among fishermen was reported as 73.3% high in Denmark (10). Heavy smoking due to work at night and alcohol intake may be related to overwork and tiredness. The prevalence of the current smoking, reported by the Lawrie et al was 38.4% and the prevalence of the alcohol consumption was 80.6% among the fishermen in Scotland (11). Casson et al reported significantly increase risk of ill health in the fishermen was associated with higher levels of smoking and longer hours of working (6).

In Sri Lanka fishing fleets has increased significantly over the last ten years. Multi day boats have increased almost two folds. Non-motorized traditional boats comprise of a 38% of the fishing fleet, which shows the under developed nature of the fishing industry in Sri Lanka (12).

Accidents and illnesses in the fishing industry are costly as in any other occupation. The fishermen have to bear pain and loss of income without any compensation and sometimes even lose their lives. The family has to share the suffering, as well as the stress that comes from knowing fishing is a dangerous profession. As fishing community is a special type of group, one cannot generalize the national mortality and morbidity rates to them. The objective of the study was to determine the prevalence of accidental injuries, hypertension, malnutrition, smoking and alcohol consumption among fishermen in Divisional Secretariat Division of Kalpitiya.

Methods

This was a descriptive cross sectional study, conducted among fishermen in Divisional Secretariat Division of Kalpitiya during the period of August to October 2011. The study population consisted of fishermen with more than 6 months experience in fishing. Details of this study have been published elsewhere (13).

The sample was chosen by applying cluster sampling method. The cluster was a fishing village, which has more than 100 fishing households. There are 10 such clusters in 28 fishing villages in the area. Of them five clusters were selected randomly and 93 eligible fishermen recruited from each cluster to fulfill the calculated sample size of 465. In each selected cluster, the index house was randomly selected from the main road. Then the houses of left side of the index house were visited till the required numbers of fishermen were recruited. If there were more than one eligible fisherman living in any household, those who had more service duration in fishing, was selected.

The study instruments were the pre-tested interviewer administered questionnaire and the record sheet for recording the measurement of weight, height and blood pressure. The calibrated beam balance was used to measure weight by the standard method. The height was measured by using height measuring tape using the standard method. Blood pressure was measured using standard technique by calibrated manual sphygmomanometer. All the participants were asked to rest for five minutes before each blood pressure measurement made. The reading was tabulated to nearest 2mmHg. Two recordings were taken 5 minutes apart and average blood pressure was taken.

Accidental injuries were defined as an injury that takes place accidentally in relation to fishing during the past six months. Hypertension is defined as when systolic blood pressure is ≥140mmHg and/or diastolic blood pressure ≥90mmHg in more than 2 occasions. Hypertension was classified into three stages; Stage I: 140-159/ 90-99 mmHg, stage II: 160-179/ 100-109 mmHg and stage III: ≥180/110 mmHg.

Ever smoker was defined as a person who has smoked any kind of tobacco product during his life time and current smoker was those who have smoked during last one year. Current alcohol drinker was defined as a person who drinks any kind of alcohol during last one year. Ever drinker was defined as a person who has drunken any kind of alcohol product during his life time. Underweight, overweight and obesity were defined based on body mass index (BMI) as <18.5 kg/m², 25 kg/m² to 29.9 kg/m² and > 30 kg/m² respectively.

Data analysis was done using Statistical Package for Social Sciences (SPSS) 16th version. The prevalence of health problems were expressed with 95% confidence intervals. Chi square test was performed to assess the difference of prevalence between the categories of selected independent variables. Multiple logistic regression was performed where eligible for controlling confounding effects and results were expressed as odds ratio (OR) and the 95% confidence interval.

Informed written consent was obtained from the participants. Those who need treatment were referred to the relevant clinics. Ethical clearance was granted from the Ethical Review Committee of the Faculty of Medicine, University of Colombo.

Results

A total of 465 fishermen participated and the response rate was 100%. The mean age of the study participants was 38.2 ± 19.3 years and majority of them were in the age group of 25-35 years (30%), Sinhalese (61.5%), Catholics (80 %) and married (85.4%) and 58% educated grade 6 and above. A majority of fishermen (52.7%) worked in single day motor boats and spent less than one day in the boat for a trip (94.2%). The monthly income of a majority (47.5%) was less than Rs. 10000.

Prevalence of accidental injuries

Accidental injuries were reported in 91 of fishermen during last 6 months. Therefore the

prevalence of accidental injuries was 19.6% (95% CI: 16%-23.2%). Most of the injuries were lacerations (n=53, 11.4%) followed by crush injuries (n=28, 6%), abrasions (n=9, 1.9%) and one (0.2%) amputation. Most of the injuries were reported from arms (n=53, 11.4%), followed by legs (n=21, 4.5%), fingers (n=12, 2.6%) and foot (n=5, 1.1%). The prevalence of accidental injuries was significantly higher among the fishermen who had educational level of grade 6 and above (p value <.01) and fishermen who work in single day motor boats compared to other boats (p < 0.02) [Table 1].

Table 1 Prevalence of accidental injuries by selected variables

			Accidental injuries			
Variable			**Number**	**Prevalence %**	**χ^2**	**p value**
Age (years)	≤ 35	(n=225)	42	18.6		
	> 35	(n=240)	49	20.4	0.23	0.64
BMI (kg/m²)						
	< 25	(n=357)	66	18.4		
	≥ 25	(n=108)	25	23.1	1.14	0.28
Number of days spend in the boat for a trip	≤ 1 day (n=438)		83	18.9		
	> 1 day (n=27)		08	29.6	1.84	0.17
Type of boat						
Single day motor boat		(n=245)	38	15.5		
Other boats		(n=220)	53	24.1	5.4	0.02
Alcohol drinking						
Current Drinkers *		(n=280)	49	17.5		
Ex drinkers / abstainers**		(n=185)	42	22.7	1.92	0.18
Education level						
Up to grade 5		(n=193)	26	13.5		
Grade 6 and above		(n=272)	65	24.0	7.8	<0.01

** Those who have no change, has increased or decreased in drinking pattern during last year.*

*** Those who have never drunken alcohol or not drinking during last year.*

Prevalence of hypertension

Of 465 fishermen 113 had hypertension, therefore the prevalence of hypertension was 24.3% (95% CI:20.4%-28.2%). Of them majority 112 (24%) had stage I hypertension and only one (0.2%) suffered from stage II hypertension. The prevalence of hypertension was significantly higher among those who had >10 years' service duration in fisheries sector ($p < 0.01$) and who smoke cigarettes >10 years ($p<0.001$) (Table 2). According to multiple logistic analysis, the duration of the service >10 years (OR=2.4, 95%CI; 1.6-3.9) and the duration of the smoking >10 years (OR=2.0, 95%CI; 1.1-3.8) were still remain significantly associated with presence of hypertension (Table 2).

Table 2 Prevalence of hypertension by selected variables

			Hypertension		
Variable		**Number**	**Prevalence %**	**χ^2**	**p value**
Age (years)	≤ 35 (n=225)	49	21.8		
	>35 (n=240)	64	26.6	1.51	0.22
BMI (kg/m²)					
	< 25 (n=357)	85	23.8		
	≥ 25 (n=108)	28	26.0	0.20	0.65
Number of days spend in the					
boat for a trip	≤ 1 day (n=438)	105	24.0		
	> 1 day (n=27)	08	29.6	0.44	0.51
Type of boat					
Single day motor boat	(n=245)	56	22.8		
Other boats	(n=220)	57	25.9	.58	0.44
Service duration					
≤ 10 years	(n=94)	13	13.8		
> 10 years	(n=371)	100	27.0	7.0	<0.01
Alcohol drinking					
Current Drinkers *	(n=280)	61	21.8		
Ex drinkers / abstainers**	(n=185)	52	28.0	.64	0.20
Duration of smoking					
< 10 years	(n=288)	50	22.0		
≥10 years	(n=177)	63	35.6	19.8	<0.001
Education level					
Up to grade 5	(n=193)	55	28.4		
Grade 6 and above	(n=272)	58	21.3	3.2	0.07

** Those who have no change, has increased or decreased in drinking pattern during last year.*

*** Those who have never drunken alcohol or not drinking during last year.*

Prevalence of overweight and obesity

Of 465 fishermen 12 were obese 96 overweight, and 29 underweight. Therefore the prevalence of obesity, overweight and underweight were 2.6% (95% CI: 1.2%- 4%), 20.6% (95% CI: 16.9%-24.3%) and 6.2% (95% CI: 4% - 8.4%) respectively.

Prevalence of smoking

Of 465 fishermen 264 were ever smokers and 254 current smokers. Therefore the prevalence of ever smokers and current smokers were 56.8% (95% CI: 52.3% - 61%) and 54.6% (95%CI: 50.2%-59%) respectively. The prevalence of current smoking was lower among Catholics compared to non-Catholics ($p< 0.01$) [Table 3].

Prevalence of alcohol consumption

Of 465 fishermen 284 ever and 280 current alcohol drinkers which gave the prevalence of ever and current alcohol drinkers as 61% (95% CI: 56.5% -65.3%) and 60.2% (95% CI: 55.8%-64.6%) respectively. The prevalence of current alcohol drinking was higher among Catholics compared to non-Catholics ($p <0.001$) [Table 4].

Table 3 Prevalence of current smoking by selected variables

		Current smoking			
Variable		**Number**	**Prevalence %**	**χ^2**	**p value**
Age (years)	≤ 35 (n=225)	124	55.1		
	>35 (n=240)	130	54.1	0.04	0.83
Number of days spend in the boat for a trip					
	≤ 1 day (n=438)	236	53.8		
	> 1 day (n=27)	18	66.6	1.67	0.19
Type of boat					
Single day motor boat	(n=245)	130	53.0		
Other boats	(n=220)	124	56.4	0.51	0.48
Service duration					
≤ 10 years	(n=94)	52	55.3		
>10years	(n=371)	202	54.4	0.02	0.88
Ethnicity					
Sinhalese	(n=286)	146	51.0		
Non-Sinhalese	(n=179)	108	60.3	1.64	0.20
Religion					
Catholics	(n=372)	191	22.0		
Non-Catholics*	(n=93)	63	35.6	8.0	<0.01
Education level					
Up to grade 5	(n=193)	104	53.8		
Grade 6 and above	(n=272)	150	55.1	0.07	0.78

** Buddhist, Islam and Hindu*

Table 4 Prevalence of current alcoholics by selected variables

			Current Alcoholics			
Variable			**Number**	**Prevalence %**	**χ^2**	**p value**
Age (years)	≤ 35	(n=225)	131	58.2		
	>35	(n=240)	149	62.0	0.72	0.39
Number of days spend in the						
boat for a trip	≤ 1 day	(n=438)	262	59.8		
	> 1 day	(n=27)	18	66.6	0.49	0.48
Type of boat						
Single day motor boat		(n=245)	150	61.0		
Other boats		(n=220)	130	59.0	0.22	0.64
Service duration						
≤ 10 years		(n=94)	50	53.2		
> 10 years		(n=371)	230	62.0	2.42	0.12
Ethnicity						
Sinhalese		(n=286)	179	62.6		
Non-Sinhalese		(n=179)	101	56.4	1.64	0.20
Religion						
Catholics		(n=372)	227	22.0		
Non-Catholics		(n=93)	53	35.6	19.8	<0.001
Education level						
Up to grade 5		(n=193)	114	59		
Grade 6 and above		(n=272)	166	61	.18	0.67

Discussion

Prevalence of accidental injuries

The present study has revealed that the prevalence of accidental injuries as 19.6%. The most common type of the accident injury was lacerations (11.4%). The most common sites of the accident injuries were the arm (11.4%). A study conducted in North Carolina reported that the prevalence of the injury in previous 12 months was 38.6% and half of these occurred in arms as in our study (7). The low prevalence in our study may be due to the less recall period (6 months) as well as variation in the fishing mechanism and the type of the fishing.

The work-related injuries and diseases of fishermen are related to the nature of fishing operations and employment arrangements with

prolong working hours. The risk of accidents to the fishermen working on small fishing vessel is high, due to carrying out many tasks at the same time. Injuries can be related to the vessel itself or to personnel accidents not involving loss or damage to the vessel. Falls and striking on moving objects are very common accidents. Bad weather conditions can increase the risk of accidents or an accident may be due to the human factors like inattention, fatigue, lack of training (2).

Prevalence of hypertension

Prevalence of hypertension was 24.3% in the present study. Among the hypertensive fishermen a significant number (24.1%) was in stage I and only 0.2% was in stage II hypertension. Kirkutis. et al (9) reported that prevalence of hypertension in Lithuanian seamen was 44.9%, with stage I 30.1%, stage II 10.9% and stage III was 0.9%. The increase in prevalence of hypertension in later study may be due to differences in risk factors. We found that prevalence of hypertension were significantly higher among those who have >10 years' service experience in the fishing sector and history of smoking >10 years duration. Consistent to our findings Kirkutis et al reported that statistically significant association of increasing duration of the service and >15 years of smoking with hypertension (9). In contrast to our findings increase age of the seamen, current alcohol consumption at least once a week and BMI > 25kg/m2 had statistically significant association with hypertension (9). According to a population based study conducted in 2005 (14), the prevalence of hypertension among the age group 30 to 65 years in four provinces in Sri Lanka was 18.8%, which indicate that prevalence was higher among fishermen

Living and working space on fishing vessels can be quite limited. Further limited crew accommodation can result in fishermen living very close to each other, and this may increase stress.(3) Stress can also increase due to factors like separation from family for a long period, heavy work for a longer duration of time. Stress is a known risk factor for hypertension as well as for other NCDs. One of the limitations of our study was we couldn't assess the level of stress of the fishermen.

Prevalence of overweight and obesity

Overweight has become a major emerging health problem. It is a known risk factor for many of NCDs. The prevalence of the overweight and obesity was 20.6% and 2.6% respectively. Prevalence of obesity was reported as 20.3% in four provinces in Sri Lanka (14) and this was higher than our study. A study done in Denmark has revealed that the prevalence of the overweight among the fishermen was 73.6% (10). The high prevalence of the overweight in the Danish study may be due to the different time period of the study and differences of the socio-economic factors of the two countries.

Prevalence of smoking

In our study the prevalence of ever smoking was 56.8 % and the current smoking was 54.6%. Kalulanda et al (15) revealed the prevalence of overall, urban and rural smoking among general population in Sri Lanka as 18.3%, 17.2% and 18.5% respectively, which were far lower than the fishermen. Consistent to our findings Kirkutis et al. reported 55.2% smokers among seamen (9). Lawrie et al reported the prevalence of current smoking in Scotland fishermen as 38.4%.(11) The low prevalence of current smoking in the later study may be due to the low response rate (57%) (11). Further Rotti also reported low prevalence of smokers among fishermen (21.8%) than non-fishing community (27.2%) (16). In contrast a Indian study reported much higher (74.3%) smokers among fishermen (17).

Prevalence of alcohol consumption

We found that the prevalence of ever alcoholics

was 61% and the prevalence of current alcohol drinkers was 60%. Prevalence of current alcohol consumption in Colombo and Polonnaruwa districts were 32.9% and 20.8% respectively (18) which were much lower than the fishing community. Another population based study also revealed that prevalence of current alcohol consumption among Sri Lankans was 30% (19). Consistent of our findings a study in India reported 63,4% of fishermen consumed alcohol(17). Rotti (16) and Lawrie et al (11) reported that 61% and 80.6% of the fishermen were alcohol consumers respectively. Kirkutis et al reported 80.2% of seamen were alcohol consumers (9).

As we recruited a representative sample from the population of fishermen, it is possible to generalize the finding to the population. Even though the standard techniques were applied in measuring blood pressure and BMI, risk of information bias was still possible. In conclusion prevalence of accidental injuries, hypertension, overweight, obesity, current smoking and alcohol consumption were higher among fishermen. If proper health promotional and better screening methods have been provided many of the conditions could have been prevented.

Conflicts of interest

None declared

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