# IMPACT OF SAFETY TRAINING ON FISH HARVESTERS' AND SEAFARERS' KNOWLEDGE AND ATTITUDES TOWARD SAFETY

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# Impact of Safety Training on Fish Harvesters' and Seafarers' Knowledge and Attitudes toward Safety

By

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## ABSTRACT

Safety training can significantly reduce injury and death among workers. A survey of fish harvesters in Newfoundland in the early 1990s (post-moratorium) found that all participants had incurred some form of injury. There is, however, no published literature evaluating the impact of safety training programs in the Newfoundland fishery. This thesis examined the impact of a basic and augmented safety-training program on fish harvesters and other seafarers. The Marine and Emergency Duties A1 programme is a basic 3-day safety-training course created by Transport Canada that all marine workers must complete. A sample of 40 fish harvesters and marine workers were allocated to either the basic or an augmented course (referred to as standard group and enhanced group respectively). All participants were surveyed before and after the training to assess their attitudes, perceptions and knowledge of safety issues. Results indicated an overall increase in knowledge in both groups with the enhanced group scoring significantly higher than the standard group. Discussion with the participants also revealed changes in attitudes toward the Marine Emergency Duties A1 programme mandate: from a general aversion (pre-training) to support for the continuation of the program (post-training). Whilst there was no significant overall difference in attitudes between the two groups, the enhanced group indicated a significant difference in more of the individual attitude items and the subscales as compared to the standard group. Further evaluation of the programme is necessary to understand its specific strengths and weaknesses as these relate to fishing and the industry.

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| | |
|---|---|
| CSA | Canadian Shipping Act |
| DFO | Department of Fisheries and Oceans |
| EPIRB | Emergency Position Indicating Radio Beacon |
| FAO | Food and Agriculture Organization |
| ILO | International Labour Organization |
| IMO | International Maritime Organization |
| MEDA1 | Marine Emergency Duties A1 |
| MI | Marine Institute |
| MOB | Man Overboard |
| MUN | Memorial University of Newfoundland |
| NL | Newfoundland and Labrador |
| OSSC | Offshore Safety Survival Centre |
| PFD | Personal Flotation Device |
| SOLAS | Safety of Life at Sea |
| STCW | Standards of Training, Certification and Watch keeping for Seafarers |
| TC | Transport Canada |
| WHO | World Health Organization |

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# CHAPTER 1

## Problem

Fishing is a traditional occupation that pre dates recorded history. For centuries fish harvesters have battled with the dangers of the sea to maximize benefits for all (Harrington, 2000; Herbert, 2000). Even today, commercial fishing contributes significantly to the economy of countries with large fishing grounds (FAO 2000; 2006). Commercial fish harvesters work in harsh weather conditions, limited space, unstable boats and often far away from any kind of help – medical or technical (Conway, 2002; Norrish & Cryer, 1990). Inherent dangers of fishing include: unpredictable weather, unstable working conditions and risk of boats capsizing. Their work is further complicated by fatigue, anxiety and physical stress created by the working conditions and the requirements of long hours of work during peak season (Neitzel, Berna & Seixas, 2006). Sophisticated equipment, advancement in technology and learning from lived experiences has resulted in improved safety measures for this extremely hazardous occupation. Commercial fishing, however, remains a notoriously dangerous occupation (Abraham 2000; FAO 2000; ILO 1999; Meng 1991).

A comparison of fishing-related fatality rates from countries including Canada, Denmark, the Faroe Islands, Greenland, Iceland, Ireland, Norway, Sweden, Russia, the U.K. and U.S.A. show that they exceed their national average occupational fatality rates (Abraham 2000). More recently, fishing decks have evolved into 'complex industrial environments' introducing a range of new risks in this industry (Conway, 2002; Thomas, Lincoln, Husberg & Conway, 2001; Neitzel et al., 2996). For instance, 36% of the deaths in Alaskan fishing industry resulted from crammed and slippery decks suggesting that

there is a need to examine the relationship between fishing equipment, machinery, the vessel and the crew (Thomas et al., 2001).

In 2005, 20211 fishing vessels were registered in Canada representing 74% of all registered vessels in the country (Transport Safety Board [TSB], 2005). Statistics from TSB (2005) show that fishing vessel accidents accounted for nearly 50% of the shipping accidents in Canada over the past 11 years. The TSB also estimated that 83% of the crew involved in reported fishing vessel accidents during that period had unknown or no formal safety-training certificate.

Safety training is defined as any activity that aims to increase a person's capacity to respond more quickly, efficiently and innovatively to the situation facing them (Hale 1984; Salas & Cannon-Bowers, 2001). It is axiomatically entwined with injury reduction (Hale, 1984). While education provides a knowledge base from which all other forms of activities of individuals are determined at subsequent stages, training is less general and tends to focus on specific skills or knowledge development. A review of 80 reports on workplace health and safety published between 1980 and 1996 shows evidence to support the direct and indirect benefits of training to ensure a safe and healthy work environment (Cohen & Colligan 1998). Furthermore, research has shown that inadequate training or lack of training is a significant contributory factor to workplace injury and death of workers (Cohen & Colligan 1998; Lincoln & Conway 1999). Various training techniques ranging from abstract education to practical hands-on training have been shown to enhance the ability to better deal with risky situations (Salas & Cannon-Bowers, 2001). Appropriate measurement of the effect of safety training, however, is a contentious issue (Cooper & Cotton, 2000; Hale 1984).

## 1.1. Background/Rationale of this Study

The International Convention on Standards of Training, Certification and Watchkeeping for seafarers (STCW-F 1995) requires that all seafarers must meet the minimum mandatory requirements of basic safety-training. As a signatory to the International Maritime Organization's STCW-F 1995 Convention, Canada is required to implement a training and certification program for all seafarers which provides seafarers with familiarization as well as some basic training on fire fighting, personal safety, social responsibility and personal survival techniques.

In keeping with the STCW-F, Transport Canada (TC, 2009) developed six training courses, effective 1999, to be conducted by schools, shore establishments and employers under the Marine Emergency Duties (MED) Program. The Basic Safety Course (A1) is the first of the six courses, which aim to create awareness and understanding of hazards, associated with the marine environment and vessels, and to provide training for skills that are necessary for survival and appropriate functions in an emergency onboard. The A1 course outlines seven specific topics with a total duration of 19.5 hours involving both practical demonstrations and classroom participation.

The Offshore Safety Survival Centre (OSSC) of the Marine Institute (MI), St. John's, Newfoundland is approved by TC to conduct MED training programs in Newfoundland and Labrador (NL). In addition to the current MEDA1 course outline, the OSSC has developed instructional video clips to be included in their regular lecture materials. These short clips augment the course by showing participants various examples such as how to wear a flotation device, what to do in an emergency, how to deploy a life raft and so on. These clips are generally short, lasting about 3-5mins. Only when instructors are talking about certain safety equipment such as a personal flotation

device (PFD), do they run the clips showing participants how to wear these. Classroom instruction and video clips precede practical sessions where each participant completes physical tasks such as wearing PFDs, deploying life rafts, jumping from heights and other emergency procedures.

In 1997, TC (TC, 2009) amended the Crewing Regulations of the Canada Shipping Act to mandate marine emergency duties for all fish harvesters. This goal, however, could not be reached by 2002 for various reasons including insufficient resources allocated for the delivery of the course to accommodate the large number of fish harvesters who were required to take it at that time. The deadline was thus postponed to April 1, 2007 giving all fish harvesters a 10-year time frame to complete the course. According to TC, any non-compliance with the MED training requirements could result in a fine of up to $10,000 under the Regulations of the Canada Shipping Act.

Although this training program has been in place for a very long time and it became mandatory for all fish harvesters a decade ago, the MEDA1 has never been evaluated to see how participants perceive the course or indeed if this training enhances their skills, challenges their attitudes to safety or increases their knowledge. As the course is both a time and cost investment for the fish harvesters and the government, it is crucial to investigate the effect it has on fish harvesters. Currently, there is no published literature evaluating the impact of safety-training on seafarers in Newfoundland.

### 1.2. Research Question and Objectives

The purpose of this study is to answer the following question: What is the impact of the MEDA1 training on fish harvesters' and other seafarers' knowledge and attitudes?

I have attempted to address this question through the following research objectives:

**Objectives:**

a) To describe fish harvesters' and general seafarers' knowledge of safety

b) To describe fish harvesters' and general seafarers' attitudes toward safety

c) To describe fish harvesters' and general seafarers' attitudes toward safety-training

d) To evaluate the impact of the regular MEDA1 training program, and an enhanced MEDA1 training program that incorporated video clips, on fish harvesters and general seafarers' knowledge and attitudes.

### 1.3. Methodology

Health is a complex phenomenon that is genetically, politically, culturally and socially constructed (Larson, 1999). In this thesis, I explore the concept of health through one of its social determinants namely, education. I am especially interested in how safety-training, a particular form of education, impacts participants' knowledge and attitudes. I have used both quantitative and qualitative research methods to gather information and analyse data on attitudes/perceptions and knowledge.

Participants' experiences, emotions, reactions and their thoughts are crucial elements to the research process and for the creation of knowledge to the benefit of all (Banister, Burman, Parker, Taylor & Tindall, 2002). I do not subscribe to a naïve realist view of qualitative research where I, as a researcher, am simply giving 'voice' to the participants, instead, my qualitative analysis involved active participation where I selected, edited, listened, spoke and together constructed the meaning of the questions, its implications and the answers to these questions (Wilkinson, 1998).

My biases are inherent in the questions and the selections of themes that I chose to represent in my analysis. I approached the research through a social constructivist epistemology to analyse data and to explore some of the social determinants of health. Under the social constructivist methodology, I used focus group discussions as a method to generate and create knowledge that relates to participants' experiences and perspectives on safety and safety training.

Focus groups allow for a dynamic negotiation of meaning in specific context. It is arguably one of the strong methodological tools for the construction of meaning and knowledge and has been used to explore issues relevant to the person-in-context (Wilkinson, 1998). Limitations of the method are discussed in chapter 6.

### 1.4. Social Determinants of Health

A number of factors affect the health of workers. The World Health Organization (WHO, 2009) defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." Disease, illness and inequalities in health arise as a result of the conditions in which people live, work, grow and age (WHO, 2008; Wilkinson & Marmot, 2003). Social and economic policies have a determining impact on life and health (Raphael, 2004). Social and economic conditions interact through education, income stability, meaningful work and working conditions and collectively they all impact the health of individual workers and in turn the population (Health Canada, 1999). The Commission on Social Determinants of Health argues that there is enough evidence to act now on the social determinants of health. It urges governments and international organizations to work together to improve research, monitoring and training infrastructures (WHO, 2008).

One of the most important determinants of health is education and training (Raphael 2004). It influences persons' incomes, employment opportunities and their working conditions; it builds their confidence and level of participation and quality of life (Health Canada, 1999). Another determinant of health is stable employment: it has a significant impact on people's physical, social and emotional health not only because it provides them with financial security, but also because it provides them with a sense of meaning, identity, social contacts and opportunity for personal growth. Working conditions, the work environment, the degree of support in the workplace and stress-related demands associated with the workplace also affect the health of workers. All of these health determinants have consequences and affect the lives of fish harvesters of Newfoundland.

Fishing is a very dangerous occupation and therefore physical and emotional safety is a very important determinant of fish harvesters' health. This not only affects the fish harvesters, but also their families, as well as their communities since their very livelihood depends upon the fishery. Safe, stable source of income and job security are important determinants of health. People with higher incomes are often healthier and live longer than people with lower incomes (Health Canada, 1999). All the social determinants of health are inter-related. The positive impact of one reverberates through the other. In this thesis safety-training is viewed as a strategy to improve on some of the social determinants of the health of fish harvesters.

### 1.5. Significance of this Study

This study will contribute to our understanding of the impact of the MEDA1 on trainees. Seafarers and especially fish harvesters have years of experience of dealing with

dangers associated with life at sea. They have learned from experiences and generations of wisdom on how to deal with hazards of the sea. We need to understand how they perceive this course and to what extent they feel that the training and lessons of MEDA1 connect with their reality. Their reaction to the training is of paramount importance since applications of lessons rests in their hands. The result will also be of interest to policy makers, proponents of fishing safety, Transport Canada and to those organizations that are involved in maritime safety allowing them to refine and enhance current programs.

### 1.6. Outline of Thesis

In this chapter, I have briefly described the nature of the problem in fishing industry, provided a background to the study and the rationale for conducting this research. I presented my research question and objectives and also described the methodology used in this thesis.

In Chapter 2, I reviewed some of the existing literature to describe the magnitude of the problem in the fishing industry; identified some of the common causes of accidents and presented a model that described accident causation. I then looked at safety training in other occupations and also introduced and assessed a training evaluation model that is useful in measuring the impact of training. I also looked at fisheries and training followed by risk mitigating factors for commercial fishing both internationally and nationally before giving an overview of the NL fishery.

In Chapter 3, I described the method, design and data collection procedures as well as the ethical considerations. I also described the qualitative and quantitative methods used in this study to analyse the data.

In Chapter 4, I described the pre-training discussions, post-training discussions and highlighted some relevant themes that were common to both pre- and post-training situations.

In Chapter 5, I presented statistical analysis of the questionnaire findings and highlighted elements that changed as a result of training.

In Chapter 6, I discussed the results in relation to the literature reviewed earlier. I offered some critical analysis of the results and the models used for evaluation; and identified some limitations of this research and recommended future directions and research.

# CHAPTER 2: Literature Review

## 2.1 Magnitude of the Problem

### 2.1.1. Extent of Fatality and Injuries in the Fishing Industry

Work-related hazards contribute significantly to injuries and fatalities worldwide (Takala, 1999; Hamalainen, Takala & Saarela, 2006). Work-related hazards or occupational hazards are inherent dangers of the work environment that include risk of accidents, diseases and deaths (Webster's New World Law Dictionary, 2006). According to a recent estimate of global occupational accidents some 970 people die every day because of work-related hazards (Hamalainen et al., 2006). There were nearly 350,000 estimated workplace fatalities and more than 260 million occupational accidents worldwide in 1998. It is estimated that one fatality occurs for every 760 occupational accidents. Occupational accident and fatality rate in the Established Market Economies (EME) are reported to be 3240 and 4.2 per 100,000 person years, respectively. Higher than average accident and fatality rates are reported for Italy, Portugal, Spain, USA and Canada. Among these EME countries, Canada has the third highest occupational injury (4852/100,000) and fatality rates (6.4/100,000).

Commercial fishing is regarded as one of the most hazardous occupations in the world today (Abraham, 2002; FAO, 2000; ILO, 1999). Even though less than 1% of the global workforce is employed in the fishing industry, the ILO and FAO estimate that 7% of all occupational fatalities occur in this industry alone (Antão, Almeida, Jacinto & Guedes Soares, 2008; Lincoln, Hudson, Conway & Pescatore, 2002). Meng (1991) analysed job related fatalities in 482 occupations in Canada and identified commercial fishing to be one of the most hazardous occupations with a fatality rate of 114.65 per 100,000 person years. More than half of all vessel-related accidents in Canada are fishing

vessel related accidents (TSB, 2005). While there has been a significant decrease in 2005 from 2000-2004 in the yearly average of marine accidents (45, down from 58), fatalities (19, down from 28) and injuries (62 down from 84); fishing vessels accidents and fatalities still accounted for the most (42% and 83% respectively).

This pattern of higher accident rates in the fishing industry is also visible in other countries, especially in those with large fishing fleets (FAO, 2000; Turner & Petursdottir, 2002). In New Zealand, the average fatality rate was 260/100,000 fish harvesters per year between 1975 and 1984 (Norrish & Cryer, 1990). In Britain, fish harvesters are 52.4 times more likely to have a fatal accident at work than the general workforce (Roberts, 2002; 2004). Between the years 1976 and 1995, 74% of the deaths that occurred in the fishing industry were due to accidents at work with a fatality rate of 103.1 per 100,000 fish harvester years. Accident and fatality rates amongst all seafarers in the UK were reported to be 27.8 times higher than those in the general workforce (Roberts & Marlow, 2005). Similarly, in Australia, fishing-related fatalities are 18 times higher than those in the entire Australian workforce (Driscoll, Ansari, Harrison, Frommer & Ruck, 1994). Higher fatality rates in the fishing industry when compared to the general workforce are widespread and have been reported in many countries and jurisdictions such as Alaska, USA (6.7x), Republic of Korea (16x), Estonia (10x), Italy (3x), Lithuania (12x), Spain (6x) (Centers for Disease Control and Prevention [CDC], 1993; ILO, 1999).

Rates for non-fatal injuries are also very high in this industry. Hospitalisation of 574 fish harvesters between 1991 and 1998 gave an injury rate of 146/100,000 fish harvesters per year in the Alaskan fishing industry (Thomas et al., 2001). In Sweden, 431 serious accidents were reported to a Swedish insurance company between 1983 and 1995 corresponding to an injury rate of 1200/100,000 fish harvesters per year (Torner &

Nordling, 2000). In New Zealand, 307 claims were compensated for fishing related injury between 1987 and 1988 corresponding to an injury rate of 10,400/100,000 fish harvesters per year (Norrish & Cryer, 1990). In Norway, the estimated injury rate between 1991 and 1996 was 760/100,000 workers per year (Bull, Riise & Moen, 2001). High rates of injury in the fishing industry are also reported in other countries with large fishing fleets. Additionally, insufficient data on the actual number of injuries and deaths make it difficult to assess the full extent of the problem.

### 2.1.2. Insufficient Data

Despite such high numbers of fatalities and injuries reported in the literature, it is widely acknowledged that the rates may actually be much higher due to under reporting of incidents, especially by self-employed harvesters, differing datasets and no formal system of data collection (FAO, 2000; ILO 1999; Petursdottir 2002; Wang, Pillay, Kwon, Wall & Loughran, 2005). The ILO (1999) estimated that 24,000 fishing related deaths occur annually world wide in this industry alone but the FAO contends that the death rate is much higher since 90% of the 15 million fish harvesters employed globally are employed in small fishing vessels (less than 24 meters) and a significant portion of them are in countries that do not collate such data (FAO 2000).

Another problem in clearly defining the magnitude of the problems has to do with comparing differing datasets. Countries that collate occupational fatality and injury data vary in their classification and system of recording making it difficult to compare data (Driscoll et al., 1994; Loughran, Pillay, Wang, Wall & Ruxton, 2002; Wagner, 2000; Windle, Neis, Bornstein & Navarro, 2005). Additionally, most countries do not have a central recording system for fishery-related incidents and accidents and instead rely on

several agencies and/or government bodies (be they national or regional). This sometimes results in data overlap despite best efforts (TC, 2002) and in some instances, individual cases may slip through the cracks if they do not fall within pre-designated categories including self employed individuals who are reputed to work through many injuries to avoid income delays (Norrish & Cryer, 1990; Wagner 2000).

Despite insufficient and inconsistent data collation, the high rates of fishery-related incidents and accidents point to two very important realities: the hazardous nature of the job and the shared global problem, especially for countries with large fishing grounds, to do something about it (Conway 2002; FAO 2000).

### 2.1.3 Causes of Accidents and Hazards in the Fishing Industry

Hoyos & Zimolong (1988, p. 9) describe hazard as "the possible effects that physical bodies have on other physical bodies as a result of energy transfer." As such physical bodies or "hazard carriers" (termed by Skiba 1973 cited in Hoyos & Zimolong, 1988) could be anything (such as water, fish slime, human beings, ice, wind) and could be anywhere with the potential of causing harm and becoming dangerous. A hazard that is avoided becomes an incident and a hazard that is not avoided becomes an accident.

There are many factors that contribute to hazardous conditions leading to accidents at sea (Abraham, 2002; Antão et al., 2008; Binkley, 1995; NRC, 1991; O'Connor & O'Connor, 2006; TC, 2002). A wide range of studies are dedicated to the study of factors that may mitigate, if not eliminate, some of these hazards. Although accidents are commonly attributed to single factors in the fishing literature (e.g. vessel-related, rough weather, man overboard, drowning, deck injuries and so on), more often than not, multiple factors interacting with one another are ultimately responsible

(Acheson, 2000; Antão et al., 2008; ILO, 1999; NRC, 1991; Windle et al., 2005). In this complicated web of interacting factors, it is difficult to discern the primary cause from the underlying factors that contributed to accidents (NRC, 1991).

**Vessel-related**

Vessel-related factors are one of the most common causes of accidents at sea (Abraham, 2002; Driscoll et al., 1994; Harrington, 2000; Thomas et al., 2001). Capsizing, fire, sinking, grounding, foundering (excessive water intake) and collision are identified as some of the primary causes of vessel-related accidents worldwide claiming half or more than half of the fatalities in many countries (Abraham, 2002; Roberts, 2004; Thomas et al., 2001; Lincoln & Conway, 1999). Vessel-related accidents account for a greater total loss to life and vessel (Jin, Kite-Powell & Talley, 2001). The primary causes of vessel-related accidents and fatalities are also similar worldwide and include: poor condition of vessel, damaged machinery, lack of training in emergency response, not wearing personal flotation devices (PFDs), lack of training in the use of survival equipment and lack of attention to stability issues (Jin & Thunberg, 2005; Lincoln & Conway, 1999; Roberts, 2004; TC, 2002; Wang et al., 2005).

In Canada, 287 people on vessels died between the years 1990 and 2000; of these deaths, 23% were attributed to capsized vessels and 21% to foundered vessels (TC 2002). While rough weather was cited as the main cause of accident for some of these cases, most of the accidents and fatalities were due to underlying factors such as overloaded boats; obstructed drains; open doors and hatches; lack of training in survival situations including using specific language to request help, launching a life raft, and not wearing PFDs or survival suits.

Similarly, a majority of accidents in British fishing vessels were primarily attributed to machinery damage (64.4%) followed by foundering and flooding (14.23%) and grounding (10.25%; Wang et al., 2005). The underlying causes for these vessel-related accidents were attributed to multiple interacting factors that include: poor maintenance of equipment, incorrect operation, inadequate training and lack of automation. In Australia, vessel-related deaths accounted for 62% of the fatalities, which in turn were caused by non-seaworthiness of vessels, failure to use PFDs and inadequate safety-training (Driscoll et al., 1994). It is noteworthy that 11% of the deaths were directly linked to job inexperience (less than 1 year of experience).

**Rough Weather**

Rough weather is a significant and inherent danger of commercial fishing (Jin & Thurnberg, 2005). It explained 53% of all fishing related fatalities in Australia between 1982 and 1984 (Driscoll et al., 1994) and 61% in New Zealand between 1975 and 1984 (Norrish & Cryer 1990). Probability of an accident is significantly higher during rough weather, higher wind speed and the winter season (Jin & Thurnberg, 2005). Some of the underlying factors that magnify weather-related accidents are inaccurate weather reporting, restrictive fishing season making it more likely that harvesters will go out for a catch despite inclement weather (Power, Neis, Brennan, and Binkley, 2007) and fish harvesters, compromising vessel stability by retrofitting and/or overloading vessels (Conway 2002).

**Fall Overboard/Man Overboard**

Man overboard (MOB) is the top ranked non-vessel related cause of injury and fatality in the fishing industry in many countries (Abraham, 2002; Lucas & Lincoln, 2007; Abraham, 2002; TC, 2002; Bull, Riise & Moen, 2001). It accounted for the single largest

percentage of deaths in the Canadian fishing industry (24%) between the years 1990 and 2000 (TC, 2002). Internationally, MOB represents almost a quarter of all fishing related fatalities: 25% in the US, 33% in Iceland, 20% in Ireland, 30% in Denmark, and 27% in Norway (Abraham, 2002).

MOB typically results from gear entanglement and heavy weather and chances of falling overboard are higher when harvesters are working alone (Murray & Dolomount 1995). While each fall results from a series of interconnected circumstantial factors, the threat to life is magnified when personnel onboard do not wear PFDs or take other protective measures (Lincoln & Conway, 1999; Conway & Lincoln, 1995; Lucas & Lincoln, 2007; Thomas et al., 2001; Lincoln, Husberg & Conway, 2000).

**Drowning**

Most deaths at sea are the result of drowning (Thomas et al., 2001; Lincoln & Conway 1999; TC, 2002). Vessel-related accidents such as capsizing, sinking and non-vessel related accidents such as MOB, especially in rough weather conditions, put the harvester at risk of injury or death. While the primary cause of accidents (such as capsizing, MOB, etc.) may not be as detrimental to life, it is the underlying causes such as not wearing PFDs, inadequate knowledge of how to operate safety equipment (such as life rafts; emergency position-indicating radio beacons [EPIRBs], etc.) that prove to be fatal. Falling into the frigid waters off the northern shores of Alaska and Newfoundland for instance, causes rapid hypothermia that increases the likelihood of death.

In Alaska 88% of all the fatalities between 1991 and 1998 were due to drowning or hypothermia (Lincoln & Conway, 1999). Between the years 1991 and 1992, drowning claimed 94.3% of all the fatalities (CDC, 1993). The odds of survival for persons wearing a PFD are 7.5 times higher than the odds of survival for persons not wearing one

(Lincoln & Conway 1999). However, of those who died in vessel-related accidents between the years 1991 and 1998, 72% of the fish harvesters were not wearing PFDs even though they were available to them. Similar high rates of non-PFD use in deaths due to drowning are seen elsewhere: 87% in UK (Roberts, 2004); 68% in Australia (Driscoll et al., 1994); 94% in New Zealand (Norrish & Cryer, 1990).

**Deck Injuries**

Unstable, wet and slippery work surfaces are a signature feature of this occupation. Additionally, commercial fishing vessel decks have evolved into an industrial environment (Conway, 2002; Thomas et al., 2001; Roberts, 2004; NRC, 1991; Lincoln et al., 2000). The extent of injuries and fatalities caused by deck layout, gear and other items on the deck have often been cited as a major cause of concern (Thomas et al., 2001; Husberg et al., 2001; Bloswick, Husberg & Blumhagen, 2003). Equipment and machinery onboard were cited as the cause of 44% of all injuries that required hospitalisation between 1980 and 1987 in New Zealand (Norrish & Cryer, 1990).

More than half of all injuries that occurred in Canada between 1990 and 2000 were due to fishing gear, machinery onboard or wet and slippery surface (TC, 2002). Fish harvesters are more prone to accidents during the 'hauling' and 'shooting' of trawl nets (Murray & Dolomount, 1994; Roberts, 2004; Torner, Karlsson, Saethre & Kadefors, 1995). Failure to secure openings on decks and below decks directly contributed to 28 fatalities and at least 20 vessel losses in Canada between 1975 and 1999 (Ayeko, 2000). Investigations have consistently found that fish harvesters were not aware that breaches of watertight integrity provided by the hatches was detrimental to the vessel and subsequently to their safety.

More than half (57%) of all non-vessel related individual accidents that resulted in fatalities in the UK between 1976 and 1995 were due to operations such as haul-in or shoot-out of trawl nets (Roberts, 2004). Over 40% of the non-vessel related individual accidents were due to gear entanglement in trawling or other equipment on deck. Fish harvesters are frequently knocked or dragged overboard and drowned or dragged into winches (NRC, 1991). Deck clutter such as nets, wires and ropes and other hazards such

as oils and ice make it easy for harvesters to slip and fall (Roberts, 2004; Lincoln et al., 2000), but often these injuries are under reported as most harvesters consider injuries to be a part of their job (Power et al., 2007).

**Government Regulations**

Fisheries management and government regulations that have been put in place to reduce pressure on declining fish stocks have increased economic pressure on fish harvesters (NRC, 1991; Kaplan & Kite-Powell, 2000; Roberts, 2004). This in turn may influence high risk-taking behaviour and decreased attention to safety at sea (Kaplan & Kite-Powell, 2000). Some of the regulations that influence risk and contribute to hazards include: reduced crew size (creating overworked and tired crew), limited fishing season (forcing harvesters to stay out in bad weather or with faulty fishing vessels), limited fishing areas (causing congestion), limited vessel length (causing them to build on vessel height and create instability) and specific gear allocation (NRC, 1991; Power et al., 2007; Kaplan & Kite-Powell, 2000).

Since the moratoria in the groundfisheries of Newfoundland and Labrador, the fish harvesters have also had to face another new challenge: their years of experience were turned into inexperience as they learned to adjust themselves to new fisheries (Power et al., 2007). They are often fishing with inappropriate vessels and without relevant equipment. Most harvesters are reluctant to discuss safety problems and fisheries management because they believe that their voices will not be heard (Kaplan & Kite-Powell, 2000). There is, however, an urgent need to incorporate fish harvesters' perceptions and comments into the regulation process (Kaplan & Kite-Powell, 2000; NRC, 1991; Poggie, Pollnac & Jones, 1995)

### Crew Factor

Crew factor are hazards faced by fish harvesters that are specific to their job. For instance, the crew aboard some of the large catcher/processor vessels catch and process 75 tons of fish into packaged products within 12 hours or less (Neitzel, et al., 2006). Noise level from the equipment on some of these large fishing vessels can cause permanent noise-induced hearing loss. Fish harvesters have to deal with the hazards of: living and working in confined spaces; working with dangerous equipment (to process catch); unstable work surfaces; decks and work surfaces covered in oil, fish-slime, ice and water (Thomas et al., 2001). The nature of fishing dictates that workers are away from home for a significant period of time and, moreover, in an instance they are required to be a fire-fighter, a paramedic, a mechanic and the judge and jury of all matters relating to the group while out at sea. These are some of the potential hazards that fish harvesters are exposed to by the very nature of their occupation (Binkley, 1995). And, as noted previously, often these are the pre-existing conditions that help to exacerbate if not actually cause the first in a series of actions leading to accidents.

### Automation

Marine safety developments in the last decade or so have made significant progress in terms of technology and vessel efficiencies through the introduction of sonar, radar, global positioning system (GPS), dimensions/quality of fishing holds, EPIRBs but less attention has been paid to improvements in human-machine interactions (Antão et al., 2008). Generally, attention to marine safety has focused on the seaworthiness of vessels from an engineering point of view but little attention has been addressed to improving vessel designs for safety in context of human factors (Loughran et al., 2002; NRC, 1991)

For example, automation is a widely hailed advancement of modern technology. The underlying assumption of automation is that it reduces human error and workload and thereby increases efficiency. While automation does enhance efficiency and mitigate risks, in some contexts it can contribute to risk (Power et al., 2007; Hetherington, Flin & Mearns, 2006). Increased reliance on automation (particularly for navigation) has meant that seafarers must now learn to operate, identify possible faults and constantly be vigilant of the machines at work. Hetherington et al. (2006) argued that these in turn impose increased cognitive demand on the already reduced workforce thereby increasing the risk of error.

It has also been argued that automation induces cognitive laxity (Lutzhoft & Dekker, 2002). Lutzhoft and Dekker (2002) used the example of the *Royal Majesty* vessel which ran aground as a result of incorrect GPS positioning despite contradictory information from all other radars. This illustrates the extent to which fish harvesters have come to rely on some newer and supposedly superior forms of technology (such as GPS) or other forms of technology (such as radar). Reliance on automation has consequences and it does not simply replace human work with machine work, but instead can create new human weaknesses and magnify existing ones (Lutzhoft & Dekker, 2002).

**Human Factors**

Evidently, the literature suggests a multifaceted causal factor of accidents. Due to a lack of systematic and uniform causal analysis, however, what is being overlooked is the overwhelmingly significant contribution of human factors toward accident causation (Abraham, 2000; Antão et al., 2008; NRC, 1991; O'Connor & O'Connor, 2006). Human factors here are defined in broader terms than just human behaviour, error, ignorance

and incorrect decisions (which are commonly identified in most literature), to include decision making at a higher level such as the policy level, skipper level and the level of the individual crew member and any human attribute that has any bearing on safety (NRC [National Research Council], 1999). Human factors have long been cited as a major source of concern, but their magnitude has not been sufficiently appreciated by marine accident investigations which tend to focus on primary causes (such as machine, weather or human behaviour [Harrington, 2000]) without looking into the underlying causes (such as whether right decisions or qualification standards were met which may have triggered the series of events (NRC, 1991).

Indication of the role of human factors as playing whether a latent or an active role, in the causation of accidents, is visible in most maritime safety literature. Hetherington et al. (2006) identified 20 studies in maritime safety that shows how human factors permeated through design issues, personnel issues and organizational/management issues. They proposed that monitoring and modifying human factor issues would contribute to greater safety in the industry. This is explained further by applying Reasons model to the fishing industry.

## 2.2. Reason's Model

An accident occurs when hazards (whether active or latent) are ignored on multiple levels as exemplified by the studies above (e.g., Hetherington et al. 2006; NRC, 1991). This was best described by James Reason (1990). Reason's model of accident causation, also known as the Swiss cheese model (Reason, 2000), was developed primarily to understand what underlying forces were at play that governed thoughts and

actions of the workers and caused some of the relatively non-random errors. He approached the problem using a systems approach.

Reason (2000) argued that the widespread and traditional use of the person approach to error management relied heavily on identifying the individual or group of individuals responsible for errors, thereby isolating the system error. In the person approach, risk management relies heavily on a culture of trustworthy reporting (of incidents, near misses and accidents) and on a reactive strategy that tries to reduce unwanted variability in human behaviour. The fishing industry is an example where much emphasis has been placed on identifying person error and remedies have tended to focus on the idea that fish harvesters needed to be guided on how to fish safely (NRC, 1991).

The system approach on the other hand views errors as part of human nature and focuses on changing the conditions in which humans work by building a system of defences. Here, errors are seen as a consequence not the cause of system failure.

The Swiss cheese model depicts a number of defensive layers - one standing behind another "on guard" (Fig. 1). The first layer consists of defences that should mitigate the risk. Second is the unsafe act itself, the third consists of preconditions, the fourth is line management and the fifth consists of high-level decision makers. In the real world, these layers are never as solidly intact as one would hope for, instead they are full of "active" and "latent" holes (hence the name Swiss cheese), that open and close to accommodate the changes of our dynamic world (Reason, 2000).

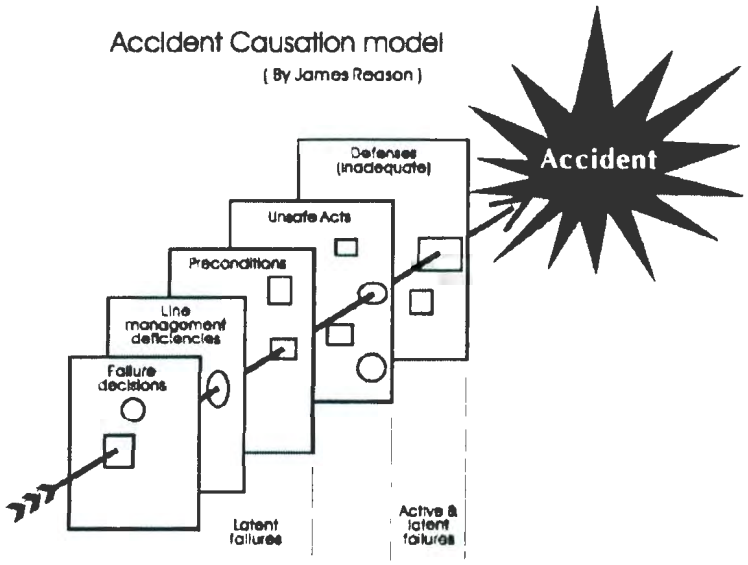



*Figure 1:* Reason's Model (Petursdottir, 2002)

The presence of holes in any particular layer in itself does not result in an adverse situation. It is the momentary alignment of the holes in each layer that brings a hazard in direct contact with the victim. The holes are the result of active failure within a layer (such as slips and mistakes, inexperience and other obvious hazards) or some latent conditions embedded in a layer (such as top level decisions made by policy makers, safety-training, regulators, vessel designers, government, etc.) which may have an adverse effect on safety but are more subtle and are usually dormant until they combine with active failures or other local triggers.

The accident causation model can be applied to the fishing industry to get a better and in-depth understanding of where errors most often occur and how to mitigate if not eliminate them altogether. The FAO (Petursdottir, Hannibalsson & Turner, 2001), for instance, used Reason's model on a hypothetical situation to show how the holes aligned in each layer of defences to result in a tragedy common to the fishing industry:

Country X does not mandate safety training for newcomers (decision layer), nor does the owner of a fishing vessel require the skipper to conduct safety drills onboard (decision and line management). An inexperienced fish harvester is asked to substitute for an unwell, experienced crew member (line management). The weather is rough (preconditions), everyone is fatigued (preconditions) and the inexperienced newcomer goes too close to deck gear (unsafe act). Vessel motion causes him to lose his balance and fall on a winch which does not have proper guard (defence) thereby severing his arm. Here, the accident occurred as a result of holes of each layer aligning at the "right" moment for the hazard to come into direct contact with the victim.

Commercial fishing is laden with active failures and latent pathogenic factors that contribute to the high number of accidents at sea. The risks have long been recognized nationally and internationally as evidenced in the literature reviewed earlier. Attempts to alleviate some of the risks have mainly focused on eliminating active failures by, for example, identifying and addressing the diverse causes of accidents at sea. To use Reason's words:

> "(A)ctive failures are like mosquitoes. They can be swatted one by one, but they still keep coming. The best remedies are to create more effective defences and to drain the swamps in which they breed. The swamps, in this case, are the ever-present latent conditions." (2000, pg.769)

One of the ever-present latent conditions of accident causation in the fishing industry is the lack of safety-training (Peturdottir, 2002). In the example cited above, a lack of training in first aid could result in the loss of an arm or even death of the newcomer or it could save his life and arm if met with appropriate actions (not to mention that safety-training could have prevented the newcomer from venturing too close to the unprotected winch, and the winch would not have been left unprotected). Although concerted efforts must be directed at reducing the number of holes in each

layer of defence, this study is concerned with the role of safety-training in mitigating some of the risks of this industry.

## 2.3. Safety-training In Other Occupations

Training is an axiomatic part of injury reduction. Hale (1984) defines training as any activity that aims to increase a person's capacity to respond more quickly, efficiently and innovatively to the situation facing them. There has been a dramatic increase in training in organizations in recent years, so much so that there is now a tendency to incorporate training as a strategic part of organizational plans instead of a separate or stand-alone event (Salas & Cannon-Bowers, 2001).

A cursory review of literature on the impact of training suggests there are two opposing camps: those that say training works (Salas & Cannon-Bowers, 2001) and those that question the adequacy of training (Darragh, Stallones, Bigelow & Keefe, 2004; Tan, Fishwick, Dickson & Sykes, 1991). For example, in one study industrial workers who had received safety-training prior to commencing work showed no significant reduction in the incidence of hand injuries compared to those without training (Tan et al., 1991). Measures such as guards on machines were believed to be more successful in preventing accidents in high-risk industries than stand-alone safety-training aimed at changing behavioural patterns.

In the logging industry, companies that participated in a safety-training program showed no significant decline in injury claim rate compared to companies that did not participate (Bell & Gruschcky, 2006). There were also no significant decline in the injury rates amongst the participant companies following the safety-training program.

Mechanizing logging tasks, employee retention and performance inspections were suggested as possible ways to address the high injury rates of this industry.

The construction industry, also notorious for high injury and fatality rates, did not show any decline in injury rates following a safety education and training program (Darragh et al., 2004). Methodological problems with the evaluation of safety-training program such as designing the intervention plans and integrating it with plans for evaluation from the start were cited as possible limitations.

In other areas, training programs have been shown to increase knowledge (Dauer, Kelvin, Horan & St. Germain, 2006), reduce injuries, induce positive attitudes and willingness to change worksite conditions (Becker & Morawetz, 2004; Cohen & Colligan, 1998), to name a few benefits. In an evaluation of a safety orientation and training program in the plumbing and pipefitting industry only 3.4% of workers who had received safety orientation experienced injury compared to 11.1% of workers without safety orientation (Kinn, Khuder, Bisesi & Woolley, 2000). Similarly, 42% of emergency responders who had previous safety training claimed that they had experienced incidents which might have resulted in their injury or death without the training (Weidner, Gotsch, Delnevo, Newman & McDonald, 1998). Construction workers who received safety training were 12% less likely to claim for workers compensation than workers without the training (Dong, Entzel, Men, Chowdhury & Schneider, 2004).

Organizations are increasingly investing in learning technologies and other methods of continuous performance improvement processes in order to remain competitive and to cater to the needs of an increasingly diverse workplace population. In today's information age, for example, workers are no longer confined to office spaces but can instead work from the convenience of their homes (Harrington & Walker, 2004).

Ensuring health and safety of dispersed employees can prove to be a challenge for employers of this dynamic job market. Innovative training strategies such as using computer based training programs have helped to reach out to a wider work population (Harrington & Walker, 2004; Wallen & Mulloy, 2006).

Training techniques such as using notification messages or mass presentations to inform workers of occupational health risks have also proven to be effective (Tan-Wilhelm et al., 2000). A group of workers receiving bulletin, posters and stickers, containing information on beryllium risk, showed significant increase in the perceptions of threat, more positive attitudes toward safety practices and behaviour than those without. Face-to-face training such as teaching in a classroom to train hairdressing students on the hazardous nature of chemical handling practices also show positive associations between participants' knowledge and risk perceptions and their intention to practice safe behaviour (Wong et al., 2005).

A few authoritative reviews suggest that perhaps it is not training that is at fault; rather, there maybe a mismatch between the requirements of training and the level of analysis. The *Annual Review of Psychology* has produced six reviews on training and development over the past 40 years (see Campbell, 1971; Goldstein, 1980; Latham, 1988; Salas & Cannon-Bowers, 2001; Tannenbaum & Yukl, 1992; Wexley, 1984). Two reviews (Tannenbaum & Yukl 1992; Salas & Cannon-Bowers 2001) have focused on describing emerging trends to argue that training effectiveness can be enhanced by keeping the following factors in mind: needs assessment, pre-training conditions, training design and methods, post-training conditions, and training evaluation. These reviews help inform our understanding of whether or not training works and if so, when, how and why it actually improves safety.

## 2.4. Kirkpatrick's Model of Training Evaluation

Among the various models for evaluating the effectiveness of training, Kirkpatrick's (1979, 1996) four-level model of training evaluation is considered the most influential (Alliger & Janak, 1989; Alliger et al., 1997; Bates, 2004; Kraiger, Ford & Salas, 1993; Russell, Wexley & Hunter, 1984; Thackwray, 1997). This model, developed five decades ago, revolutionized the area of training evaluation and until today, remains one of the most commonly used approaches (Alliger et al., 1997; Bates, 2004; Beech & Leather, 2006; Thackwray, 1997).

Within this framework, questions about the effectiveness of training are defined within specific categories: reaction, learning, behaviour and result. It is conceptually the most appropriate framework for the present study because the model outlines that the objectives of training should determine the appropriate assessment criteria. So effective evaluation of training revolves around the question: effective in terms of what: reactions, learning, behaviour and/or results?

Kirkpatrick argued that the first step of any training evaluation is to measure the reactions to training. He defined this as a measure of the degree to which trainees liked or disliked a particular training program. He cautioned that while this is the same as evaluating trainees feeling toward a program, this does not measure or indicate if any learning has taken place. It is, however, important to evaluate reaction in order to understand and scan the general feeling. To evaluate reaction, he suggested using forms that are pre-designed to elicit specific information, such as:

i) Identifying specifically what we want to find out;

ii) Using a written sheet to list the specified items above for participants' comments;

iii) Designing the form such that their reactions can be quantified and tabulated;

iv) Making the forms anonymous to help obtain honest reactions;

v) Providing space for additional comments that were not covered by pre-designed questions.

Evaluation of learning is more difficult than the evaluation of reaction. Kirkpatrick acknowledged and limited the definition of learning as the extent to which participants understood and absorbed knowledge, principals/learning objectives and skills delivered in the training course. He recommended using experimental research methods such as a before-and-after approach, measuring each participant's knowledge objectively, using multiple choice tests or behavioural tests when facts and principles are being taught, and using statistical analysis and control groups whenever possible. He contended that the marketability and status of a training program is proven by how effective it has been in terms of its learning and reaction evaluation. He suggested that to evaluate learning, we need to:

i) Measure each participant's knowledge to obtain quantitative results;

ii) Use a pre- and post-training approach to relate learning to the training program;

iii) Measure learning on an objective basis;

iv) Use a control and experimental group to measure the effects of training;

v) Use statistical analysis to prove learning in terms of correlations or confidence intervals.

The third assessment criterion is behaviour. Behaviour evaluation measures the transfer of knowledge and skills learnt in training back to the job. This is more difficult to measure than learning. To evaluate training programs in terms of behavioural changes, he suggested:

i) A systematic appraisal of before and after the specific trained behaviour has taken place;

ii) An appraisal of behaviour by the participant, their supervisor(s), peers who are familiar with the individual's professional development and so on (the more the better);

iii) Statistical analysis of performance before and after training that relates the change to the training;

iv) Post-training appraisals should be conducted after 3 months or more to allow participants to put in practice what they learnt;

v) Using a control group for comparison.

Finally, results evaluation measures the impact of training on the organization in terms of the its stated desires and goals (such as performance and profitability). This is, by far, the most difficult to measure given that there are several extraneous variables affecting an organization. Kirkpatrick gave examples of and suggested a participative and collaborative approach to evaluating results.

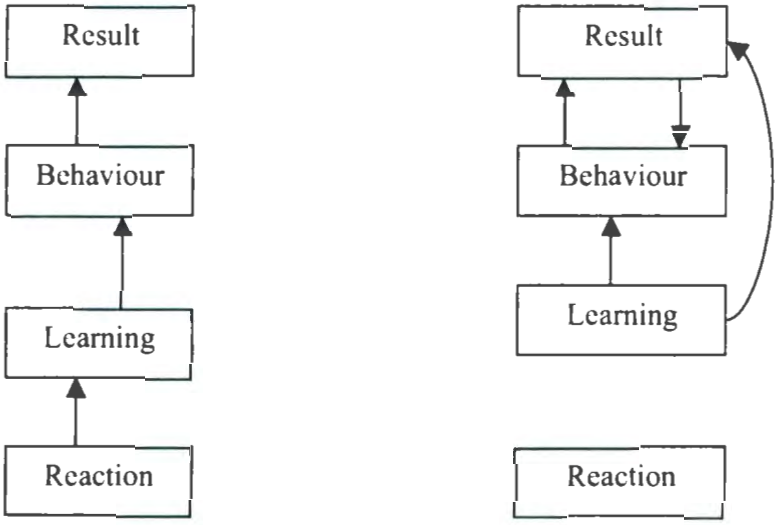
Critics of the Kirkpatrick model have argued that while its popularity and power lie in its simplicity, this is also its weakness (Alliger & Janak, 1989; Alliger et al., 1997; Bates, 2004; Kraiger et al., 1993). As mentioned previously, there are factors on an individual and organizational level that can influence training effectiveness before, during and after the training process (Tannenbaum & Yukl 1992; Salas & Cannon-Bowers

2001). The model does not consider or account for the complex network of these factors that surround and interact.

Unfortunately, implicit assumptions within the model have led to misunderstandings and overgeneralizations (Alliger & Janak, 1989; Alliger et al., 1997; Bates, 2004; Kraiger et al., 1993). The first implicit assumption of the model is that these levels provide information that is in some ascending order in terms of value (Alliger & Janak, 1989; Bates, 2004). For example, a measure of behaviour provides more information than does a measure of learning which in turn provides more information than a measure of reaction. In this regard, level four is assumed to be the best indicator of training effectiveness. Advocacy for bottom-line dollar criteria at level four thus became more frequent in research journals, practitioner journals and textbooks even when, in reality, this may be an inappropriate measure. Also, not all training is meant to effect change at all four levels. For instance, a measure of reaction is sufficient to detect company pride.

A second critique of the model is the interpretation that each level is causally linked to the other. This assumption has led to a linear view of the model (Fig. 2) such that positive reactions are assumed to lead to greater learning which influences positive behaviour which translates to positive organizational results (Alliger & Janak, 1989; Alliger et al., 1997; Bates, 2004). Unfortunately, this has led to a widespread belief that a positive measure of reaction can serve as a proxy measure for training outcomes at other levels (Bates, 2004). One study, for instance, found that over 94% of training evaluations in business organizations used reaction measures as an indicator of training effectiveness (Bassi, Benson & Cheney, 1996; study cited from Bates, 2004). Alliger and Janak (1989) have presented an alternative view of the causal linkages among the levels where level

one is unrelated to the other levels, level two is important to some degree to level three and four, and levels three and four are causally interdependent on each other (Fig 2).




a. Traditional model b. Alternative Model

*Figure 2:* Traditional Hierarchical Model vs. Alternative Model. Adapted from Alliger and Janak (1982)

Despite its limitations, Kirkpatrick's model has made significant contributions to evaluating training over the years and has helped focus training evaluation practices on training outcomes (Newstrom, 1995). It has also helped to show that single outcome measures are not sufficient to evaluate training and promoted the importance of multiple measures of training effectiveness (Bates, 2004). The model distinguishes between learning (level two) and behaviour (level three) and has thereby promoted an awareness of the learning transfer process that is crucial in making training effective. Most important of all, it serves as a useful preliminary heuristic for training evaluation (Alliger, et al. 1997; Alliger & Janak, 1989; Bates, 2004)..

## 2.5. Fisheries and Training

Some countries have started to legislate safety-training for fish harvesters. Norway was the first country in the world to start a systematic training program for fish harvesters (Langaune, 2000). Safety Training for Fishermen (STF) started as a trial project in 1981 comprising a 2-day curriculum that emphasized rescue and fire protection. By 1989, regulations were drawn up to mandate STF for all personnel onboard with course duration of 40 hours and a refresher course of 20 hour after a 6-8 year gap. The course was comprised of basic safety-training in the areas of fire fighting, working conditions, protective measures, first aid and hazard recognition. The program was evaluated in 1989 and 1996 concluding that training increased participants' knowledge about and attitudes toward the importance of workplace safety (Langaune, 2000). The number of work related fatalities also declined when comparing data from before 1981 to that from recent years. By August 2000, nearly 27,000 people (the majority being fish harvesters) had participated in the course. The number of people participating in refresher courses was less than the number of people participating in the basic course due to out-migration of experienced fish harvesters to other occupations. Experienced fish harvesters were being replaced with inexperienced fish harvesters.

Similarly, Icelandic authorities established a safety-training centre, The Maritime Safety and Survival Training Centre (MSSTC) in 1985 onboard the vessel *Saebjorg*, to train fish harvesters in basic safety and survival and accident prevention at sea (Snorrason, 2000). The primary objective of the MSSTC training was to increase fish harvesters' knowledge of safety issues. It presently offers a 40-hour course (extended from the initial 30 hours) and by the end of 1999, a total of 15,000 seafarers had participated in the course. In addition to a reduction in the number of accidents at sea,

Snorrason (2000) cites its popularity and acceptance by the seafarers as a strong indication of its success. The *Saebjorg* has called at every seaport of Iceland making it easier for trainees to attend the course by minimizing travel and living expenses. By 1999 all of the Nordic countries to some extent were offering safety-training for fish harvesters (with Finland being the last to join in). While safety program varies in the length, financial support, mandatory requirement for training and training style, the courses revolve around similar training elements: accident prevention, rescue, first aid, safety apparatus, safe work environment, fire prevention and fire fighting (Petursdottir, 2002).

## 2.6. Risk Mitigating Factors: Global (FAO/ILO/STCW)

Internationally, safety in the fishing industry is extended through the help of global organizations such as the International Labour Organization (ILO), the International Maritime Organization (IMO) and the Food and Agriculture Organization (FAO) of the United Nations (UN). These international organizations, together with Nation States, have developed several conventions, regulations and guidelines focusing on safety at sea. Some of the prominent ones are discussed below.

One of the first-ever international conventions that dealt with safety at sea was SOLAS (Safety of Life at Sea; IMO, 1974; Petursdottir et al., 2001). This was held in London in 1914. Prompted by the 1911 Titanic disaster, SOLAS stipulated the minimum standards for design, construction, equipment and operation of ships. While regarded as the most important of all international treaties, SOLAS did not cover fishing vessels or older ships that were not propelled by machines. Subsequently, SOLAS 60 approved three resolutions that were directly applicable to fishing vessels by requiring vessel

stability; rescue equipment on board and calling upon governments to report to IMO on the extent to which SOLAS was being implemented on these vessels.

Another important international convention that related to safety at sea was the UN Law of the Sea Convention of 1982 (Petursdottir et al., 2001). This convention gave nations rights and responsibilities to maintain their marine resources and stipulated that each state should exercise its jurisdiction, administrative control and social matters related to ships flying its flag. Furthermore, the flag nations were responsible for taking necessary steps to ensure that ships were compliant with safety at sea regarding: equipment, vessel construction, vessel seaworthiness, manning of vessels, crew training, communication maintenance, using signals and preventing collisions. The idea was that while each state is free to deal with safety issues of vessels flying their flag, the stipulated safety initiatives meet international standards and must be compliant with international regulations.

The first ever international convention that dealt directly with the safety of fishing vessels was the Torremolinos International Convention for the Safety of Fishing Vessels 1977 (IMO, 1977; Petursdottir et al., 2001). Formulated along the lines of SOLAS, this convention outlined stability requirements for fishing vessels for the first time ever in an international convention; requirements for equipment and watertight integrity; fire fighting and protection, lifesaving equipment, emergency procedures, protection of crew, mustering and drills, radiotelegraphy and radiotelephony and onboard navigational equipment. The problem with this convention was that many member states felt that the requirements were either too strict or too lenient for their fishing fleet. Subsequently, a protocol to the convention was prepared but it is yet to be ratified by the nation states.

International organizations (ILO/IMO/FAO) have also assisted in research and publication of documents that are aimed at improving the occupational health of fish harvesters such as the Code of Safety for Fishermen and Fishing Vessels, Part A and B; the Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels; the Document for Guidance on the Training and Certification of Fishing Vessel Personnel (Wagner, 2000). These documents are intended as educational tools and guides to supplement but not supersede any of the existing national/international regulations.

Additionally, the ILO has also had several meetings at the international level to discuss and promote dialogue between the various sectors in the fishing industry (ILO, 1999; Wagner, 2000). The Tripartite Meeting on Safety and Health in the Fishing Industry is one such example that brought together international governments, employers and employees of the fishing industry (Wagner, 2000; ILO, 1999). Drawing on literature from around the world, a report was prepared by the ILO secretariat for discussions at the meeting that identified how some countries had extensive training programs (often reflecting the guidelines provided by the various international organizations) whilst others had none or was very limited. The three representative parties negotiated extensively before prioritising health and safety-training as an area in need of urgent improvement and also agreeing that the Standards of Training, Certification and Watchkeeping for Seafarers (STCW)-F convention be ratified and fully implemented.

The STCW-1978 (IMO 1978) was one of the first internationally agreed Conventions that addressed the minimum standards of training for seafarers but was never ratified. Revised in 1995 (STCW-F, 1995), the STCW-F contained special

recommendations for crews on fishing boats. It stipulated that fish harvesters must complete a basic safety-training course in survival techniques, fire fighting, emergency procedures and first aid. Although this has not yet been ratified, the application of this convention has exceeded the minimum requirements in some countries while it is virtually absent in others. Canada, along with some countries in Europe, South America and Australia, has implemented STCW-F's requirements into their training programs. Commercial fish harvesters are now mandated under the Crewing Regulations of Canada Shipping Act to participate in a Marine Emergency Training program.

These conventions, documents, protocols and guidelines are few amongst others that evidently point toward the enormous efforts made at the international level to mitigate some of the risks and to improve safety at sea (Wagner, 2000; Petursdottir et al., 2001). While there seems no shortage of regulations and guidelines at the international levels, it is apparent that in many cases there is a serious lack of implementation at the national level and that the benefits are not reaching a majority of the harvesters for various reasons, including the fact that most of these standards/regulations are yet to be ratified (Wagner, 2000).

## 2.7 Risk Mitigating Factors: National

In Canada, legislative authority over vessel safety falls under three governmental departments: the Marine Safety Branch of Transport Canada is the federal representative body to regulate safety in the fishing industry. The Transportation Safety Board of Canada (TSB), under Transport Canada is responsible for investigating accidents whilst the Canadian Coast Guard (CCG) under the Department of Fisheries and Oceans (DFO) is responsible for search and rescue operations and for promoting safety in the

industry. In addition to these, Newfoundland also has a host of other agencies that are either pro-actively engaged in or play an important role in the safety of fishing vessels such as the Canadian Coast Guard Auxiliary, Marine Institute (MI) of Memorial University, and the Professional Fish Harvesters' Certification Board (PFHCB) to name a few.

The oldest piece of legislation that governed marine safety in Canada was known as the *Canada Shipping Act* (CSA, 2009). This was based on the *British Shipping Merchant Act 1894* of more than 100 years ago. On July 1, 2007, the CSA was replaced by the *Canada Shipping Act 2001* (CSA 2001). This is the principal legislation in Canada that governs marine safety for all vessels operating within Canadian waters and for all Canadian vessels operating in all waters. The objectives of the CSA 2001 are to protect the health and well being of individuals and crew of vessels participating in marine transportation; promote safety and an efficient marine transportation system; ensure that Canada meet its international obligations and agreements with respect to shipping and navigation; and to promote harmonization and protection of the marine environment from navigation and shipping related damages. This new Act has shifted from being an inspection-based regime (under the previous one) to a compliance-based regime. It is less prescriptive than the previous one and places more emphasis on owner and operator responsibilities.

An important set of Regulations that came into effect as a result of the CSA 2001 is the *Marine Personnel Regulations*. These regulations are divided into three parts and are concerned with safety, health and well being of individuals and crew, and ensuring that Canada meets its international obligations. The first part of these regulations deal with certificates of competency for seafarers and, as a signatory to the international

convention on STCW, these regulations outline the specific knowledge, skills and abilities required to function appropriately on Canadian vessels.

The Marine Emergency Duties (MED) training courses deal with basic safety at sea with regard to emergency response to fire, first aid and ship abandonment. MED training has been mandatory in Canada since the late 1970's on large commercial vessels, but under the Crewing Regulations of the CSA, this course became mandatory for all seafarers on July 31, 2000. This deadline was later extended to July 2002 and subsequently to April 30, 2007 due to a lack of resources required for the implementation of these courses. The MED courses have been modified in accordance with the STCW requirements and continue to be mandatory for all seafarers under the *Marine Personnel Regulations* of the new CSA 2001.

There are three MED courses: A1, A3 and A4. MEDA1 is the standard course consisting of 19.5 hours of training. It provides information on how to recognize and react to hazards and emergencies; how to deploy, store and care for safety equipment; how to provide assistance for self and others during an evacuation; and the knowledge and skills necessary for survival and rescue at sea. The MEDA1 is a combination of in-class lessons and hands-on practical lessons especially on extinguishing fires and using survival skills and safety equipment in the water. Although the MEDA3 and MEDA4 also provide knowledge of basic safety at sea, these two courses are much shorter and comprise of 8 hours of in-class instruction only. The MEDA3 is limited to vessels operating no more than 25 miles from the shore and the MEDA4 is limited to vessels operating no more than 2 miles from the shore. In Newfoundland and Labrador, TC-approved MEDA1 courses are offered only at the MI while the MEDA3 is offered through the Professional Fish Harvesters' Certification Board (PFHCB). In 1997, the

PFHCB in Newfoundland became operational under proclamation of the Professional Fish Harvesters Act of the Newfoundland government (PFHCB, 2009).

In the early 1990s, the concept of professionalization came about as a strategic way to restructure the fisheries: to give it stability and recognition in the wake of the moratorium (PFHCB, 2009). The objectives were to promote fish harvesters as a professional group, to standardize levels of training and experience, and to play a greater role in the management of the fishing industry. It was discussed at the community level by fish harvesters and the FFAW, DFO, Department of Fisheries and Agriculture and other government agencies and educational institutes. Three certification levels were created: apprentice, level I and level II. Existing fish harvesters were 'grandparented' into this new system. With the exception of level II, all other harvesters were required to complete a specified number of hours fishing with a level II and complete some education/training to upgrade to the next level. Also, fish harvesters needed to be at level II for DFO to consider access to species license. New entrants were required to register under the sponsorship of a professional skipper and only after a defined number of years of fulltime fishing activity and the completion of a basic safety-training course (which includes some of the MED training) were they allowed an upgrading to the next level.

## 2.8. Overview of the Newfoundland Fishery

Fishing is an integral part of Newfoundland culture. The settlement of Europeans in the early 1800s was driven by the abundance of fish and it was the fisheries that laid down the foundation, culture and norm of the settler society that subsequently built itself as Newfoundland (Schrank, 2005). Fishing was initially a seasonal activity that

gradually changed with favourable market conditions and when Great Britain realized the economic advantages to having a more permanent base in Newfoundland. By the 1800s, Newfoundland was reputed to be the world's largest exporter of salt codfish (Murray, Macdonald, Simms, Fowler, Felt, Edwards & Gates 2005; Newfoundland and Labrador Heritage, 2005).

The lives of the earlier fish harvesters were such that they were tied to merchant companies that provided, on credit, supplies and the necessary equipment for fishing whilst taking fish in return for the goods. Fishing soon became a family tradition where all family members (male and female; young and old) had some part to play in the whole process starting from sailing or rowing out to catch the fish to splitting, salting, tending and drying. By the 1880s, fishing was at its peak with a population of 200,000 people residing in the various coastal communities and 99% of the male work force engaged in the fishery business. Fishery related products became the colony's main (90%) export (Roy 1997; Murray et al., 2005; Newfoundland and Labrador Heritage, 2005).

This extensive fishing enterprise brought its own set of challenges to occupational health and safety. Fish harvesters are the product of many generations of experiences and therefore rely heavily on career-wisdom (Gray, 1987). Surviving situations that involved risks increases their acceptance and accommodation of even greater risks. An earlier report on the occupational health and safety in the Atlantic fishery of Canada (Gray, 1987) portrayed how the seemingly non-existent government regulation of occupational health and safety, no established employer/employee relationship (hence no accountability for occupational health and safety), low level of formal education and a lack of clear understanding of the risks involved, compounded

by the physical demands of the job, had significant impact on the health and well-being of workers in the industry.

Over time, extensive foreign fishing, industrialization and economic diversification in Newfoundland and Labrador had a detrimental impact on the fishing industry (Schrank, 2005). By the late 1960s, groundfish stocks in particular, had been severely damaged due to foreign over fishing. Canada declared a 200-mile economic exclusion zone in 1976 to reduce the amount of foreign fishing off the coast of Newfoundland, but domestic fishing filled the gap. Realizing the immense pressure on fish stocks, the federal government declared a moratorium in 1992 for a two-year period, but it soon became evident that the moratorium would need to be extended far beyond the stipulated period because of the continued depletion of the fish stock (Murray et al., 2005).

Fish harvesters consider their job as a way of life and an identity (Murray, 2007; Murray & Rodgers 2005). This strong bond and their sense of pride in the job is a result of generations being raised in fishing communities. Indeed commercial fishing has been described as an occupational subculture – it is a group of individuals operating within a larger society with their own unique set of values, beliefs, attitudes, customs and behaviour (Murray and Rodgers, 2005; Pollnac, 1988; Poggie, et al., 1995). Poggie et al. (1995) report that the harsh nature of the sea, heavy reliance on technology for production and safety, unstable and seasonally dependent income; and, physical distance from immediate help are some factors that help shape and characterize this fishing subculture. The fish harvesters of Newfoundland are a typical example of this occupational subculture.

A survey of fish harvesters in Newfoundland in the early 1990s found that all those who were surveyed had incurred some form of injury in the fishing industry (Murray & Dolomount, 1995). The study was conducted right after the moratorium with the aims of describing the character of accidents, extent of safety knowledge, practices, attitudes and beliefs of the inshore fish harvesters of Newfoundland. This study confirmed the high rate of accidents in the Newfoundland fishery and concluded that despite being knowledgeable of safety regulations and placing importance on safety precautions, a large number of fish harvesters still engaged in risky fishing practices. The CCG conducted a review of fishing vessel safety from 1993 to 1999 to conclude that injury rates, workers compensation claims and search and rescue operations were on the rise in Newfoundland (DFO, 2000). In particular, they noted that the number of fatalities in fishing vessels less than 35 feet in length was substantially high.

### 2.9. Summary and Concluding Remarks

The causal mechanisms for risky practices have been studied from various angles. Some studies suggest that the inherent dangers associated with fisheries help select a certain personality type (Binkley 1995; Poggie et al., 1995; Pollnac, Poggie & Cabral, 1998) that helps to psychologically adapt the individual to this occupation. Notably, the fatalistic attitude of fish harvesters has received much attention in previous research (Binkley, 1995) as a protection mechanism for psychological adaptation. Other studies (Murray & Dolomount, 1995; (Power et al., 2007; Kaplan & Kite-Powell 2000) have suggested that fisheries management leaves room for risky practices and that fish harvesters have no choice but to engage in risk taking behaviour in order to survive

economically. Whatever may be the case for risk taking practices, safety-training may help to mitigate some of the inherent dangers of this hazardous occupation.

The Canadian Transportation Accident Investigation and Safety Board, commonly known as TSB, mandated by the federal government to improve transportation safety, cites lack of training and safety awareness as one of the main underlying cause of accidents in the Canadian fishing industry (Ayeko, 2000). Applying Reason's model to investigate accident causation, TSB identified many safety deficiencies and made several safety recommendations. Two of the most commonly identified deficiencies by the TSB are: 1) inadequate safety-training and awareness; and 2) inadequate survival equipment, skills and drills. Over the years, TSB has recorded several fishing vessel-related incidents where "(o)ne person's knowledge of life raft deployment, distress signal use or emergency response could (have) easily save(d) an entire vessel and crew" (pg. 205, Ayeko, 2000). Conversely, it has also recorded incidents where entire crew were recovered after drifting in severe winter conditions in the North Atlantic waters because they were able to deploy and use life saving equipment as intended.

# CHAPTER 3

## Method

This study was one component of a multi-component and multidisciplinary study of fishing safety funded jointly by the Canadian Institutes for Health Research (CIHR) and by the New Initiatives Fund of the Canadian Search and Rescue Secretariat. SafetyNet has major funding from CIHR to study occupational health and safety of marine and coastal work. It has nine inter-related research projects under the three broad categories of: Fisheries-related, Oil & Gas, and Human Cold Working Conditions. Of the nine projects, this study is under the umbrella of SafeCatch (Fisheries-related), which conducts research on fish harvesters' occupational health and fishing vessel safety.

**3.1 Design:** This study used a mixed method experimental design. Two groups of seafarers registered in the OSSC MEDA1 program in St. John's NL in 2006, were randomly chosen to be in either a standard group or an enhanced group. The standard group underwent regular MEDA1 training, which consists of 12.5 hours of in-class lessons and 7 hours of practical training, totalling 19.5 hours. Their training focused on seven areas: introduction and safety, hazards and emergencies, fire fighting, emergency response, life saving appliances and abandonment, survival, and rescue. In addition to the regular training program, the enhanced group watched a series of video clips on safety. A total of 12 short video clips (approximately 3-5 minutes in length) on safety at sea and safe emergency responses were integrated into the multimedia classroom presentations. They were developed by staff at the OSSC and partially funded by SafeCatch. They were informed by findings from previous research (Murray &

Dolomount, 1994, 1995; Murray & Rogers, 2005). These were shown to the enhanced group as a supplement to their regular training and course materials.

**3.2 Sample:** Fifteen classes of MEDA1 were conducted on-site at the Offshore Safety and Survival Centre of the Marine Institute, Foxtrap, St. John's. One class conducted off-site in Eastport, Newfoundland, was also included in this research because of the suitability of the group (which consisted entirely of fish harvesters) and to help attain a good sample size. Thus a total of 16 classes with a total of 130 students who registered with OSSC between September and December 2006 were informed of this study and solicited for their participation. The study only included participants whose professional work experience was related to the marine environment. Out of the 16 classes of students, 1 class was excluded after they had completed the first part of the study because they were later combined with another class of students (for logistical purposes of OSSC). Of the 130 total students of OSSC, 8 declined participation and 28 consenting participants' questionnaires had to be removed (due to incomplete information) which resulted in a total sample size of 94. The following equation was used to calculate sample size: $N = z^2 \times p \times q / d^2$. Alpha was set at 0.05; $p = q = 0.50$; $d = 0.15$. Using this equation, the minimum sample size was calculated to be 43. To determine change between pre-test and post-test scores within a group with power set at 0.80, alpha set at 0.05 and a medium size effect of 0.50, the minimum sample size required was 27 (Cottrell & McKenzie, 2005).

**3.3 Questionnaire:** A Training Evaluation Form (TEF, Appendix A) was developed to elicit information on perceptions, attitudes and knowledge of safety. This TEF was adapted from Murray and Dolomount (1995) and it consists of four sections.

Section I Demographics: This included six questions on the demographics of the participants (gender, age, experience, principal occupation, role on vessel and size of boat)

Section II Perceived causes of accidents and safety attitudes: This section contained two parts. The first part was a list of 25 potential causes of accidents at sea. Participants were asked to rate a series of 25 factors as not important, slightly important, important or very important in causing accidents at sea. Of these 25 causes, 20 were derived from a measure developed by Murray & Dolomount (1995). These 25 causes were classified as internal/behavioural (i.e., factors that are determined by the behaviour of individuals) and external/situational (i.e., factors that are determined by the context or situation in which individuals are working). In this thesis it was hypothesised that after the intervention the participants would rate the internal/behavioural causes as more important and that this change would be greater in the enhanced group. An additional five potential causes to accidents at sea (water temperature, type of fish, time of day, colour of boat and individual's height) were added to the questionnaire.

The second part lists a series of 23 statements of safety derived from Murray & Dolomount (1995). As per the original questionnaire, these were categorized into 6 subscales: skepticism, responsibility, boatmanship, vessel restrictions, regulations and risk acceptance and participants were asked to indicate if they strongly agreed, agreed, didn't know, disagreed or strongly disagreed with each of the statements. In this thesis it was hypothesized that after the intervention, participants would show a significant change in

their agreeableness or disagreeableness (as appropriate) with each of the subscales and that this change would be greater in the enhanced group.

Section III Safety Knowledge: Questions in this section were taken from the formal OSSC examination of the MEDA1 course. It included a list of 20 multiple-choice questions that tests their knowledge of safety at sea. This list of questions was developed and provided by TC to be used by all establishments conducting and issuing the MEDA1 certificate. The questions were not modified or amended in any way.

Section IV Safety Training: This section included a list of open and close-ended questions regarding OSSC and other safety-training issues.

A pilot version of the questionnaire was administered to a group of MEDA1 participants in July 2006. Their comments and responses led to revisions and removal of certain items from the questionnaire. The post-training questionnaire for the standard group only included Section II, III and a few items from section IV (See Appendix B). The post-training questionnaire for the enhanced group included some open ended questions on the video clips and was otherwise identical to the standard group's post-training questionnaire (See Appendix C).

**3.4 Ethical Considerations:** The Human Investigation Committee (HIC) of Memorial University of Newfoundland approved this study (see Appendix D). The OSSC also granted permission to conduct research with instructors and participants of MEDA1 courses. The project was explained to all participants of MEDA1. Permission was given by HIC for instructors to be involved during focus group discussions to aid in facilitating as and when necessary. Only those who voluntarily consented to participate in this study were asked to complete a consent form preceding any actual research (See Appendix E

and F for consent forms for the standard and enhanced groups, respectively). Participants were also assured of complete confidentiality of their responses. An arbitrary number known to participants only was used to match participants' responses on the questionnaires before and after the course.

**3.5 Procedure:** All instructors of MEDA1 were informed in advance of this study by the research coordinator of OSSC. I arrived half-hour early on each day of the class to brief and meet with instructors and hand them a copy of the focus group questions (Appendix G). Assignment of participants into a control or enhanced group was driven by both practical and statistical reasons: I arrived at OSSC with questionnaires and consent forms for both the standard and enhanced group, if there were technical or logistical difficulties with the video clips that day, we proceeded with the regular safety-training program and classified them as the standard group.

Participants were not aware of the research until they had registered for the course and were seated in class. Once all participants were ready to begin their lesson, the instructor introduced me. I explained the research, my intention and the nature and significance of this project and solicited their help. I informed them that their participation in the research entailed completing a questionnaire and discussing issues on safety and training before and after the completion of their 3-day course. Participants were advised that the group discussions would be audio taped and that only I, and any transcribing assistants (if any) would be listening to the tapes. There are several dialects of English spoken in Newfoundland, many of which are very strong and therefore difficult to understand. During the focus group discussions, some instructors joined in collaboratively to help out with language/accent barriers.

Once all queries had been answered and consent forms completed and signed, I handed out questionnaires to individual participants. Instructors asked participants to call out a number between one and ten or to twelve (depending on the number of participants in class) and explained that these numbers were to be used during their fire drill to count off evacuees. I asked them to remember their number and to write it on their questionnaires to be able to match their responses before and after the course. These numbers do not match up to any personal identification. Participants were assured of confidentiality and that anything they said or wrote as part of the study that could potentially identify them would be kept confidential.

I and/or the instructor assisted in reading the questions aloud or writing responses of participants on their behalf when requested to do so. After the pre- and post-training questionnaires were completed, classroom participants were invited to participate in a group discussion on safety and training. This group discussion was led by myself and in some instances instructors joined in to help me deal with the language barrier. The discussions were audio taped and lasted between 10 to 45 minutes. A repeat of survey completion followed by group discussions took place at the end of their 3-day training.

**3.6. Analysis:** Quantitative and qualitative analytical tools were used for data analysis. Perceived causes of accidents (Section II) were analysed individually and clustered using Murray & Dolomount's (1995) classification scheme: 'internal/behavioural' and 'external/situational' categories. Rough sea, safety awareness of crew, lack of a safety culture, boat size, slippery deck, poor safety regulations, untidy deck, experience of crew, stress and bad luck were coded as 'external/situational' causes, and alcohol, safety

awareness of self, overloading, carelessness, level of safety training, overworking, tiredness, overpowering/speeding, rushing and sickness were coded as 'internal/behavioural' causes. All remaining perceptions items were categorized as 'other' causes including: water temperature, type of fish, time of day, boat colour and individual height.

Attitude items (Section II) were also analysed individually and clustered using Murray & Dolomount's (1995) classification scheme: skepticism, responsibility, boatmanship, vessel restrictions, regulations and risk acceptance.

**3.6.1. Quantitative Analysis**: The quantitative data were entered onto a database and analysed using the Statistical Package for the Social Sciences (SPSS) for windows version 11 (Brace, Kemp & Snelgar, 2003). Descriptive statistics (frequencies) were computed for the demographic data. To compare the change in scores over time (i.e. before and after the intervention) the paired sample t-test (for total knowledge scores), the McNemar test (for individual knowledge items), and the Wilcoxon signed ranks test (for individual perceived cause of accidents and attitude items) were used. To compare results of the standard and enhanced groups, independent samples t-test (for total knowledge score) and the Mann-Whitney U test (for total cause and total attitude items) were used.

**3.6.1.1. Wilcoxon Signed Ranks Test:** The Wilcoxon signed ranks test is widely used in different fields of study to assess change in scores (Pett, 1997). The following critical assumptions were met:

a) Matched observation from random sample: the data consists of paired observations from participants who were tested pre- and post-training.

b) Scale of measurement must be at least ordinal if not continuous: A Likert-type scale of measurement was used where 1 = Not Important, 2 = Slightly Important, 3 = Important and 4 = Very Important (for perceptions scores); and, 1 = Strongly Disagree, 2 = Disagree, 3 = Don't Know, 4 = Agree and 5 = Strongly Agree (for attitudes scores) of pre- and post-training questionnaires. Attitude items 1, 2, 3, 4, 6, 7, 15, 17, 18, 19, 20 were reverse coded for analysis.

c) Symmetrical distribution: the pre- and post-training scores followed a symmetrical distribution.

**3.6.1.2. Mann-Whitney Test:** The Mann-Whitney test is employed to test the difference between two independent groups. This is a commonly used nonparametric test in the field of health care research and the data satisfied the following three critical assumptions (Pett, 1997):

a) Scale of measurement: the independent variable (standard and enhanced groups) was dichotomous and the scale of measurement for the dependent variable was ordinal (attitude scores ranged from 1 being Strongly Disagree to 5 being Strongly Agree [reverse coded where appropriate] and perceptions scores ranged from 1 being Not Important to 4 being Very Important).

b) Random sample of independent observations: there were no repeated observations in the data for the same participant and the two groups were mutually exclusive. Although groups of participants were randomly assigned to watching video clips or not, the initial sample of students at the OSSC were not randomly selected (it was a convenience sample).

c) Unspecified but similar population distribution shape: although the distribution of the dependent variable (attitude scores) for the two groups is not required to follow normal distribution (for non-parametric test), in this case it did. For cause scores, the combined score of differences took a symmetrical shape (almost a bell curve), but the individual standard group's pre and post cause scores were slightly skewed.

These findings are presented in Chapter 4.

**3.6.2. Qualitative Analysis**: Group discussions were recorded on tape. Two tape recorders were present during focus group discussions. Before recording, I would test the recorder by recording my voice and giving it an ID by saying: "Focus group. Sept 13th. Experimental. Before". On the tape, I would also mark the appropriate ID as such: FG.13.Sept.Expt.Bef. This ID was established with the intention of separating pre- and post-training discussions between the standard and enhanced groups. I wanted to analyze and present my data comparatively.

Unfortunately, the quality of the recordings was poor. Classes were held in four different classrooms of the OSSC building. Extra noise that was not audible during taping was picked up during the taping and made it impossible to hear clearly what was being said. I tried to get the groups to sit closer in one group, alternatively, for a big group (of 8-12) I placed a recorder closer to a bunch of people huddled together, sitting in a semi-circle, near each cusp. The recordings were still unclear, due to noise from perhaps the overhead projector and/or other unknown electrical appliances that were present in the room. I also tried using computer software and recorded the discussion

directly into my laptop on a disc with the hope that the extra noise could be washed down using software, but this was not much help either.

Another barrier for me was the strong Newfoundland accent. Instructors were all informed of this in advance and helped by either restating my question or by repeating to me what was said. Permission was taken from HIC for instructors to be involved in the focus group discussions. This allowed for the discussions to proceed in context of their class with minimal 'disruption' due to research and also helped my research discussion flow despite language barrier.

I initially transcribed the tapes. This allowed me to really look at what was being said and/or not said by participants. Graham Small (co-researcher of the project) also helped by transcribing some of the tapes and we would also go over each other's transcripts to see if we could complete them any further. Unfortunately, due to the poor quality of tapes, time constraints and the accent barrier, I had to send the tapes to be transcribed by a professional. Once I received the transcripts, I read them actively (Braun & Clarke, 2006).

Remembering the actual focus group discussions helped with the interpretation of the transcripts. However, large chunks of data were lost, particularly from those discussions that had left me enriched and more knowledgeable about how participants saw the training program and this had in turn made an impression on me personally. Often as I read the small chunk of each transcript that was audible, I could place these in the larger context of what had been said, and I knew the thread of the discussion that followed, but I did not have it in data form. I decided to work with only the available transcribed data. This meant that I did not have sufficient material to separate the

enhanced and standard groups. Instead, I decided to separate pre- and post-training categories for the qualitative analysis.

Thematic analysis is a very widely used and useful tool for analyzing qualitative data (Braun & Clarke, 2006; Attride-Stirling, 2001.). Put simply, thematic analysis involves sifting through the dataset to identify patterns or themes. This is the base or foundation from which most qualitative analysis including thematic analysis begins. Complexities of thematic analysis are reflected in the varied forms of analysis that 'emerge' out of a thematic analysis such as grounded theory, content analysis and discourse analysis. I chose to follow the guidelines as outlined by Braun & Clarke (2006). They outline six steps for qualitative data analysis:

1. Familiarizing yourself with the data: this involves transcribing, reading, re-reading, and jotting down notes to help organize.
2. Generating initial codes: identifying interesting features of the data set and collating them accordingly.
3. Searching for themes: collated codes soon evolve into broad themes, so this phase involves searching for more similar themes
4. Reviewing themes: this involves checking the themes against the codes and the data set, reorganizing, deleting and/or generating more themes.
5. Defining and naming themes: refining each theme according to the overall aim of the analysis and generating appropriate names for themes and their definitions.
6. Producing the report: selecting examples, relating them back to the research questions and literature.

Part of doing good qualitative analysis is to use guidelines as guidelines only. I read through my data corpus to familiarize myself and for clarity of thought. My data corpus

consisted of the entire set of transcripts, the tapes and my own understanding based on first hand discussions with participants before, during and after the training. My dataset evolved after I had seen a pattern of responses in my data corpus. I sometimes used one particular thematic thread (code) such as "safety equipment" to look for similar patterns across the data corpus. At other times, I looked through one particular data item (i.e., transcript) to identify a new thread of thought and identified it as a new theme. I read the transcripts on their own and also with tapes. Excerpts that were similar to each other were placed under some of the codes that I was already anticipating, for instance: attitudes, knowledge, safety-training and regulations. When going back and forth from transcripts and looking closely at what was being said in each sentence, themes emerged that were different from each other within these codes and could be further subdivided or made redundant. So I began to isolate threads that were associated differentially. This led to shifting themes and codes, rearranging, generating more codes and deleting previous ones. I had a Microsoft Word document that was 'live'. Analysis was done at a semantic level: given the limitations of my transcripts, I decided to pull together similarly patterned data and describe the patterns. The codes eventually evolved into broader themes or categories. Similar themes were placed in broader categories and summarized. There was a clear distinction between pre- and post-training categories so these were subdivided accordingly. However, a third broad category also appeared: general concerns common to participants both before and after their training where training appeared to have no impact.

To lay out the results and present my analysis of the group discussions, I decided to summarize each of the three broad subdivisions of categories (pre, post and common

grounds), describe the categories that fell under each of these subdivisions, and provide a summary of the analysis. This is presented in Chapter 4

# CHAPTER 4

## Focus Group Findings

### 4.1 General Pre-training Attitudes and Perceptions

Four broad categories were identified that best described some of the pre-training discussions. These included: attitudes toward safety, attitudes toward safety-training, attitudes toward safety equipment and attitudes toward regulations. Within each category there were a number of themes each of which is detailed below. Pre-training participants expressed a nonchalant attitude toward safety. They knew the risks involved in their occupation were very high and had therefore learnt to be resilient. They perceived safety through a framework of risk.

There was a feeling of general apprehension amongst participants, as they felt intimidated by some of the requirements of the training program. Most of them were unaware of what to expect during their 3-day training but were hoping to acquire a general overview of how to prepare for an emergency. While they were not denying the benefits of safety training per se, they believed that it really would not add much to their overall experiential knowledge.

Participants reported that safety equipment that was required onboard vessels was not tested to see if and how it operated, or if it was maintained. Most participants reported being unaware of correct handling procedures for their safety equipment.

Discussions of regulations elicited a strong negative reaction expressed with emotion in most participants to the point that discussions of other topics would generally revolve back around regulatory enforcements. The main frustration with regulations was the belief that the government's ulterior motive was to make money. Participants were frustrated with the government for not taking a proactive and holistic approach to regulating safety in the fishing industry.

### 4.1.1 Category 1: Attitudes Toward Safety

*I've been in situations… then I say I'm not doing that no more – never again. Three months later I'm saying I'm never doing that again. (laughter)*

Three themes were identified that described different aspects of the participants' attitudes toward safety. These are described as nature of the job, occupational freedom and safety as common sense. Participants described their occupation as dangerous and perceived the risks involved in their occupation as a part and parcel of their livelihood. The concept of safety therefore revolved around the limitations imposed by the risks of their job. In an occupation laden with dangers, making judgement calls was considered the norm, which in turn was associated with a certain kind of exhilarating freedom. Cognisant of this fact, participants looked at safety as requiring that they be conscientious or use common sense.

**Theme 1: Nature of the Job.** Fishing involves dealing with uncertainty. Participants realized that fishing was a very risky operation. Therefore, to survive they learned to be resilient and persistent. Making judgement calls and 'pushing one's luck' were identified as common characteristics of this occupation.

*Participant: You know, a lot of times with us – we're often at our zone - and we get out there… you get out there; you get the bad forecast called for with the… you get out there and it'll be a bad day and you say I'm steaming for three hours now; I'm not going to be back in. I'm going to have to try to put up with a bit more than what she'd regularly put up with, you know, but still…*

*Participant: Yeah.*

*Participant: …you're pushing it like that.*

*Facilitator: We all do that, right – push.*

*Participant: Oh yeah.*

*Participant: I've been in situations… then I say I'm not doing that no more – never again.*

*Participant: Yeah, until next time.*

*Participant: Three months later I'm saying I'm never doing that again. (laughter)*

*Participant: Yeah, well…*

*Participant: The conditions change so fast. You know, when we've done….dozens of times you'll overload your boat. Conditions are good at the time...*

*Participant: That's right.*

*Participant: …but on the blink of an eye they don't be long changing.*

**Theme 2: Occupational Freedom.** Participants perceived the risks associated with their occupation as an expression of their own freedom. They were proud of being free individuals bound only by Nature's laws. Some of the safety rules and regulations in the fishing industry were perceived to be inhibitors to enjoyment of their way of life.

*Participant: Fishermen are that way. They're all…*

*Participant: Yeah.*

*Participant: …free individuals or we wouldn't be at it, right?*

*Participant: Yeah.*

*Participant: Certain freedom – that's why it's getting so damn bad now. There's so many regulations and things being forced on you – oh my Christ…*

*Participant: Yeah.*

*Participant: Yeah.*

*Participant: …turns your stomach – turned a lot of older fellows from fishing.*

*Participant: Yeah.*

*Participant: Oh yes.*

*Participant: You know, it makes me stomach sick.*

*Participant: Yeah.*

*Participant: You got no say in anything.*

**Theme 3: Safety is Common Sense.** For some, staying safe was a matter of common sense. Safety courses were for naught if harvesters lacked the experience that would give them the common day-to-day knowledge to survive at sea.

*Participant: I look at it – you can take all these courses but… the thing I look at is common sense. If they haven't got that, this means nothing.*

### 4.1.2 Category 2: Attitudes Toward Safety Training

*They can offer what safety course they like, the people are still going to do what they want to do and more than likely now I'll take that course and I'm still going to go out and go lobster fishing alone*

Five themes were identified in this category including: reluctance toward the mandatory training program, expectations of the training, intimidated by the requirements of the training, cost as a deterrent to training and shift in paradigm. Most participants' attitudes toward the training program were a reluctant compliance. They were unsure of what to expect in their 3-day training course other than a general boost in confidence and an increase in knowledge. They were intimidated by the thought of being in a classroom setting, being in the water and jumping from heights (which would be part of their practical lessons). They also felt that the overall out-of-pocket cost for the training program was too steep for them and believed this was acting as a deterrent for others. Participants felt that there was a shift in the paradigm in the fishing industry from being a traditional occupation to a more professional occupation. They perceived the training program as a reflection of that change but while some were able to accept the change and look at the positive side of the training, others felt angered by this change. Their frustration over the move toward a "professional" fishery manifested itself as reluctance to participate in the training programs.

**Theme 1: Reluctant compliance toward mandatory training program.** Participants felt compelled to enrol in the safety training course. They believed that they would not

have come for the training if this was not a regulatory requirement. There was a strong negative emotion surrounding the institutionalization of the training program. While they felt that any training would be good and necessary in their field of work, the association of training with government requirements spoiled it for them. Some of their reluctance was assuaged by the positive feedback they had received from previous participants. There was still, however, a strong sense of resistance toward the training program in general.

For example:

*Participant: They forced us to come here. (laughter)*

*Participant: Yeah, the only thing about this is we're getting some experience too – something new out of it. At least you know what to do.*

And another example was:

*Participant: To be quite honest about, I didn't want to do it.*

**Theme 2: Generalized expectations of the training.** Participants were expecting a general increase in awareness and knowledge after their training. They were unsure of the specifics of how the training may be of help in their daily life, but were hoping for a boost in confidence and increased knowledge. For example one participant said:

*Participant: At least now we will know what to do if ever we have the opportunity to be in an emergency I guess.*

Another said:

*Participant: Well, see, if you did this course then you should be prepared for some of those things.*

**Theme 3: Intimidated by some of the requirements of safety training.** Participants felt intimidated by some of the requirements of their training program. Most participants had left formal education at a very young age. They expressed concern about being in a classroom setting and participating in formal lessons. In addition to that, they were also

afraid of swimming and jumping from heights. They cited these as some of the most common deterrents of safety training and felt that these factors not only intimidated them but that they were inhibiting others from attending MEDA1.

For example:

*Participant: Why? Well, first of all I can't swim and I got a fear of it so (laughs) that's my biggest thing.*

And also:

*Participant: Yeah. Even if you can't swim… it's the thought of jumping in the water is the… Right? From the height.*

And another example was:

*Participant: A lot of fellows in the fishery too, right, who are nervous to go back to school. I know there's two on our boat – old fellow skippers... actually, our skipper said we're supposed to do this course. Now they were nervous.*

**Theme 4: Cost as a deterrent to training.** Another inhibitory factor for the training program was the overall out-of-pocket cost. Most participants were able to receive a government subsidy for their training program, however, other fees associated with their training such as travel and lodging, the health check, being out of work for the three days of training, and the balance of the training fees added up to be a deterrent for them.

One participant said:

*Participant: There's two things here: one is time and one is money.*

And another said:

*Participant: Well, then again b'y, getting people in – we've got to drive back and forth come Christmastime – anytime – I mean gas right now going back and forth traveling, I mean sure they're going to help you with school. Everybody is not next door to the school. You know, but I mean it's going to spoil 50… 75 dollars for some people when they're traveling back and forth here. And like you say you're not getting a lot of people in here. A lot of people can't afford to come in, probably.*

**Theme 5: Professionalization in the fishing industry.** Participants felt that there was a shift in the industry from being a traditional occupation to a more professional occupation. The implementation of a mandatory safety-training program was a reflection

of the new changes that were seeping through the industry. Some perceived and accepted this change as the new way (especially the younger generation) while others felt that this move was the root cause of much of their frustration. They saw a gap between the needs of the industry (such as an experienced worker) and availability (such as a less experienced but more certified worker). Their frustration over this dichotomy manifested itself in the form of reluctance toward the training program.

For example:

*Participant: Because I think that the whole thing behind it is professionalization; and tomorrow morning I'm going to be… one of these days I'm going to have to say I'm looking for a man and I'll have to leave the thing in and they're going to put out what they want. I might not be able to take Harry because he's a best kind of a fishermen but he haven't got his teeth cleaned so he can't come with me. So I got to have mate over there who got his papers up the length of his arm but…*

And another example was:

*Participant: The biggest problem I find with that is the person in charge may have a policy in place, but it's not chasing after people to enforce it all the time. What I've been finding with the younger generations going to sea – you don't have to tell them anymore. It is automatic because it's starting to (…) some years ago we had a hard time getting the guys to put an emergency suit aboard, and now it's become second nature*

### 4.1.3 Category 3: Attitudes Toward Safety Equipment

*We don't even know how to put it on. They're in the bottom of our bunk and we don't know nothing about them, only they're there.*

Three themes emerged in this category. These are: inappropriate storage and misuse of safety equipment, safety equipment as a necessary evil, and poor or non-existent maintenance of safety equipment. Participants had the basic mandatory equipment onboard to be complaint with the law but were mostly unaware of their proper use and maintenance. They perceived the equipment as clutter of space aboard a vessel but deemed it necessary to have onboard. Most participants said that they had never worn

their suits, deployed a life raft or used a fire extinguisher and were unsure of the correct handling procedures for most of their onboard equipment.

**Theme 1: Inappropriate storage and misuse of safety equipment.** Participants reported that some safety equipment was stored in locations that were not readily accessible in the event of an emergency or was used for purposes other than survival. This was a common occurrence with life jackets in that participants kept them onboard to be compliant with the law but used them as pillows or cushions for support. Prior to their training, they were unaware of the damage that could result from improper use.

For example:

*Participant: Makes a good pillow.*

*Participant: Yeah… up under the cuddy. I know, sure, growing up – out jigging my whole life, right? Where are the life jackets? Up in the cuddy. And someone got… if someone got… started to get sick or something, what would we do – lay him up and let him go to sleep on it.*

*Participant: Yeah. I put two or three in a garbage bag and make a good pillow.*

And another example:

*Participant: We don't even… we don't even know how to put it on. They're in the bottom of our bunk and we don't know nothing about them, only they're there.*

**Theme 2: Poor or non-existent maintenance of safety equipment.** Participants were not testing their safety equipment to see if and how it operated. Even though they possessed the right gear on board (which was often misused or inappropriately stored as noted above), they were not maintaining it appropriately.

For example:

*Participant: Well, b'y, to tell you the truth I never ever seen neither suit. I never ever put one on. I've had it out. Rolled it out and looked at it. Rolled it up and put it back in the bag.*

And another example was:

*Participant: Not how many people who have not put them on… how many people have not taken them out of the bag in over a year?*

**Theme 3: Safety equipment as a necessary evil.** Carrying safety equipment onboard was not just a fulfilment of regulatory requirements, it was also a reassurance of safety. Even though participants were unhappy about the amount of equipment that had to be onboard, they appreciated the importance of having the equipment at hand in case of an emergency. It gave them a reassuring sense of being prepared for an emergency:

*Participant: And another thing – with all this equipment… then you got to get an extra boat to lug around, you know what I mean? (laughter)*

*Participant: Yes. Yes.*

*Participant: You can only take so much so…*

*Facilitator: That's true, and there's so many safety gear that you have to carry. Do you think it really… I mean it takes up space; it clutters the space.*

*Participant: It do, but you know, the other side of it is that I'd rather it took up a bit of space than me taking up a bit of space in the ground. (laughter)*

*Participant: Yeah, that's part of it.*

*Participant: You know, it's… well, it's better to be prepared than not at all.*

### 4.1.4 Category 4: Attitudes Toward Regulatory Requirements

*The fishermen are licensed to death.*

Four themes emerged in this category that best described participants' attitudes toward regulatory requirements of the fishing industry. These themes included: expensive safety requirements, enforcement of regulations for profit, haphazard, incongruent safety procedures, and loopholes in the regulations. Pre-training participants perceived regulations to be a bane to their survival. They felt that the industry was being regulated haphazardly and only in the wake of tragic events. While this was not a *carte blanche* denial of the value of safety regulations, safety training or even safety equipment, participants felt that they were being overwhelmed with unsystematic regulations that involved

exorbitant fees and bureaucratic hurdles. Paying individual fees for individual regulatory requirements in the long run was adding up to a substantial cost. Participants blamed the government for not taking a more holistic and proactive attitudes toward regulating safety in the industry.

**Theme 1: Expensive Safety Requirements.** Fishing is an expensive activity and not as profitable an occupation as it used to be. Most harvesters were finding it hard to keep their operations going and to earn a living. Given their situation, participants felt that safety regulations that required purchasing additional safety equipment, vessel inspections in combination with other fishery-related fees were being changed and implemented too often and were becoming too expensive a burden to carry. For example:

*Participant: No. It's not… you're reading me wrong. I'm not talking about too much crab in the boat. I'm talking about there's not enough of a quota of crab there to pay for the expense – I have to buy this stuff.*

And another example was:

*Participant: See, there's another thing that's going to be within another few years. For our size of our boat right now – 34 – like we can't even afford to put fuel in them right now. So this is getting shoved down our throats and, all of a sudden, I'm going to need a suit and then I'm going to need a life raft?*

*Participant: I agree. Right now all you need is a life jacket. You're not…*

*Participant: But I mean within another two to three years it's going to be coming to that. So if I'm not making money, why do I need a life raft or a suit on if I can't afford to go out.*

**Theme 2: Enforcement of Regulations for Profit.** Part of their frustration with the expense was the belief that regulations were being implemented for governmental profit. While they appreciated that they might gain some knowledge through the safety-training course, they strongly objected to it being forced on them. They likened it to other past experiences where they felt forced to purchase safety equipment or pay fees that they felt were unnecessary. Participants were skeptical of new rules and regulations and some felt

that they were being forced to justify someone else's existence or profit. Having to do the MEDA1 training was no exception. For example:

*Participant: Might learn a nice bit, but I resent the fact that I've been forced to do this in order to keep my license.*

*Facilitator: Yeah.*

*Participant: The same thing with that black box[1] too. I was forced… there was something forced on me that I didn't need or want, and I was forced to pay for it in order to go fishing.*

*Facilitator: Yeah.*

*Participant: The same thing with the radios.*

*Participant: Yeah, same thing with the radio. We had a VHF aboard and that was only a VHF same as what we had, only a more expensive one,…*

*Participant: It was just more expensive.*

*Participant: …that's all.*

*Participant: Yeah.*

*Participant: And that was forced on us.*

*Participant: I don't like… I mean in lots of cases we're forced into situations to justify somebody else's profit or existence. That's the point I don't like about it, right?*

*Facilitator: Yeah.*

*Participant: I think, no doubt, like he said, to open up a - I don't know how much I'm going to learn. I don't know what to expect, but all I'm looking for, really, is a piece of paper at the end of the week…*

*Facilitator: Yeah.*

*Participant: …but by the time the end of the week comes, I'm hoping that you got my mind changed.*

*Participant: Yeah.*

*Participant: That I've picked up a lot. A lot of fellows do say that, right?*

*Participant: That's right, b'y, I mean I…*

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[1] Vessel Monitoring Systems commonly known as 'Black Box' is a device that allows to help monitor vessel activity with regards to compliance with fisheries regulations

*Participant: But I do pick it up so…*

*Participant: Yeah, and that's one thing I find, you know…*

*Participant: I'm a doubting Thomas until you prove it. I'm always that way.*

And another example was:

*Participant: It's the expenses.*

*Participant: It's the expense that you got to go through to get this stuff, and it's not like it's a volunteer thing or you're getting a discount on this because it's…I mean the government don't care… the government is going to come and say you need this, it's going to save your life, but we're going to charge three times the price. So, really, all they want is the money grab out of it.*

*Participant: You got to have it now so the price… we're going to put the price on it.*

**Theme 3: Haphazard and incongruent safety procedures.** Participants felt that safety in the fishing industry was being regulated rather haphazardly and procedures were usually put in place after an accident. For instance, they felt that regulatory restrictions on vessel length instead of vessel weight had caused more harm than good with respect to safety issues. While they were not denying the value of all safety procedures per se, they were frustrated by the way the procedures were being implemented. They were also frustrated by the bureaucracy involved and felt that instead of making things easier for them some of the regulations brought about overwhelming logistical and financial hurdles. Citing experiences that left them less than satisfied with regulations, some participants conceded to feeling apprehensive toward the MEDA1 mandate as well.

For example:

*Participant: What amazes me is they're going to put… they got these programs in place and, believe me, I think it's probably worthwhile. How can they justify spending all this money in safety and on the other hand they design a boat – 64 ft. 11 – that can tip over, and they knew it can tip over and have her 35 feet high from the keel to the top. Ask my buddy there. We went over and watched one being built in Trinity. Now I said how high is she? She's 35 feet. That's fine and dandy, but how can they justify something like that, you know; and these are the same guys that drew that plan up – the naval architects – that tomorrow morning, if you wanted to go and get a license, get your boat that you fished in for the last 25 years – very stable – is going to tell you that your boat is not stable. So you got to spend $6000… $5000 is it? – to get that…*

And another example was:

*Participant: Well, that's even like this course. I mean I've heard – and I've said it; I'm guilty of saying it – it's nothing now only a money racket*

*Facilitator: It's quite expensive but you know what…?*

*Participant: But it's not… I know… I mean if it was 5000 dollars to do this course, it's worth it in the long run if one life is saved; but it's the way that it comes across. Like no matter… they're licensed to debt. The fishermen are licensed to debt. I mean every time they turn around it's…*

*Participant: Money.*

*Participant: …money; and now it seems like it's going to be more. Every time there's a tragedy something comes in place. There's nothing never included. It's always individual prices for something, and that's the frustrating part in all this.*

**Theme 4: Loopholes in regulations.** Participants felt that the requirement to complete MEDA1 to avoid losing their license was not a very useful way of regulating safety in the industry. They suggested that there was no way of ensuring, without an expiration date on the MEDA1 certificate or regular spot checks, that participants were actually complying with or reviewing their training. They perceived this to be a loophole in the regulation and this reinforced their perception that the government was interested in profits as opposed to ensuring participants were up to speed on survival techniques in the long run.

For example:

*Participant: But I was only talking about the government. They're forcing me to do this, right. In order for me to get my license, they're forcing me to do it and then they leave it up to me then to carry out. Like as long as I paid this 500 or 700 dollars to start in there and get that piece of paper, I can go off fishing, right. That's all they're worried about. They're not going around saying there's going to be spot-checks on you or spot-checks on you to make sure that you know how to use that gear.*

And another example was:

*Participant: That's what I'm saying, but the government is not following on through. As long as you got that certificate… that diploma at the end of this week, you're okay.*

### 4.2 General Post-training Attitudes and Perceptions

Five broad categories emerged from the post-training discussions. These were: attitudes toward safety; knowledge, skills and attitudes toward safety equipment and the practical training session; attitudes toward safety training; attitudes toward regulatory requirements and recommendations.

There was a change in participants' perceptions of safety. Post-training participants felt that the presence of safety equipment onboard and the limited knowledge of safety that they had prior to completing the course had given them a false sense of security. They learned to redefine safety within a context of possibilities.

By being trained to use a variety of safety equipment under different conditions, participants believed that they were now better able to judge the necessity and appropriateness of their safety equipment. They believed that the training helped them trust, use and know how to maintain their equipment better. Attitudes toward safety equipment shifted from seeing it as a necessary evil onboard to seeing it as a trusted and respected life saver.

Before their training, participants were apprehensive about the demands of the physical training but once they had gone through the challenges and confronted their fear they felt empowered. Participants learned to understand their own strengths and weaknesses as these related to equipment, survival techniques and emergency response techniques. They attributed this greater self-understanding and the subsequent changes onboard vessels and in their life as these related to emergency preparedness (such as being more organized, buying equipment that was above the minimum requirement and everyone being more vigilant and proactive about safety) as a direct impact of their training.

There was a marked difference in participants' attitudes toward the MEDA1 regulatory requirement after the training. Not only did they feel that it was necessary for them to have participated in the program, they deemed it necessary for all seafarers to undergo the training. Those who had participated in MEDA3 and could compare the two programs believed that MEDA1 was better suited to the needs of seafarers because it involved a lot of practical lessons.

Realizing the benefits of the program, participants recommended that the training be given to extended family members of all seafarers, that the MEDA3 (mandated for vessels within 25 mile radius) be abolished requiring everyone to do the MEDA1. They also recommended that first aid training be included with the MEDA1, survival suits be a mandatory requirement onboard and that a refresher MEDA1 course should be available and required.

### 4.2.1 Category 1: Attitudes Toward Safety

*Fishing and that and survival suit and lifeboat training is not the same*

Three themes were identified in this category. These are labelled: dispelling common myths, facing fear, and change in fatalistic attitudes. Post-training participants viewed hazards and risks as something definable and manageable. Realizing that they did not know how to operate or maintain their safety equipment prior to the training, they felt that they had been instilled with a false sense of security. Their concept of safety shifted from being defined by the limits imposed by risks to being defined by understanding their own strengths and potentials and realizing the specific possible uses of the various safety items.

**Theme 1: Dispelling common myth.** Participants felt that what they had previously known with regards to being safe and the trust that they had placed on their equipment

may have given them a false sense of security. The definition of being safe changed from being compliant and possessing safety equipment to being aware of what kind of equipment they possessed and how it could be of help or even how to use it.

For example:

*Participant: Well, there's a lot of stuff that we had and we never got to use it and we didn't now, so we know how to use it. That's the whole thing. We probably all have it, but we didn't know how to use it; and what we got home – some stuff what we have got aboard is no good, which have changed but we did not know.*

And another example was:

*Participant: And you see what false sense of security a fire extinguisher gives you. You see a 10-pound cylinder doesn't last very long.*

**Theme 2: Facing Fear.** The sea was a tragic reminder of loss for most fish harvesters. They appreciated the treacherous nature of the sea and were intimidated by the thought of being in the water. Having gone through the training and having tested some of the survival equipment on the water, they felt like they had confronted their fear and built their confidence. Their concept of safety was redefined not only by knowing of the possibilities of survival equipment and the knowledge of how to use it, but also by an overall change in their attitudes toward being able to face their fear and realizing that fear as something manageable.

For example:

*Participant: I can swim. I used to swim all the time when I was a kid, but my friend drowned a couple… a few years ago, and since then I'm afraid to go… I love the water…but I don't know. I just can't do it, but I'm not scared now if I had like a life vest on or one of the emergency suits. I know with that I'm fine.*

And also:

*Participant: Mine too – mine was fear – not anymore though. I can get in the water now with one of them emergency suits on. I love it. I was terrified.*

**Theme 3: Change in fatalistic attitudes.** Participants felt that the MEDA1 familiarized them with equipment, increased knowledge and boosted their level of confidence. While they were cognisant of the fact that life at sea was unpredictable and uncontrollable and that they could not be prepared for all eventualities, they were appreciative of the fact that the training gave them enough knowledge, confidence and strength to respond to an emergency. They reported a change in their attitudes toward survival possibilities and risk management and their notion of safety was re-contextualized within a framework of survivability. For example:

*Participant: No, not 100% but you're just learning more about the equipment and how to use it and handle it. It will never prepare you for on the water because every day you go out there it's a different day. It's never like coming in here. You always got the… day after day it's a routine; but every time you go on that water and I've been there for about 35 years – I never saw two days alike yet. I tie up my boat the same when I come in the harbour. When I'm ten and fifteen mile off land, it's always a different day – tide, winds, fogs, anything. So it will never prepare you until you're out there and the situation happens, but it will… it did learn a lot – that maybe I could save my life and help save someone else's life now.*

And another example was:

*Participant: To some extent, right, because you go out there... when something goes wrong everything is going wrong the one time, but it'll prepare you for so much of it, and you'll gradually go on with the rest of it. Everything will keep… it'll fall into place. It's still not going to prevent anything from happening; and when something does happen, you're not going to prevent all the chain… all the links of chain beyond that because there's still going to be stuff go wrong after that point, but it will… you know, at least you'll now have some idea of what to do right from the start.*

### 4.2.2 Category 2: Knowledge, Skills and Attitudes Toward Safety Equipment and the Practical Training Session

> *Well then, if you didn't know how to do it or was never showed it you wouldn't know it. You'd say – fuck, I'm going to drown anyway. (laughter) There's more room for somebody else. (laughter)*

Six themes were identified in this category including: knowledge of equipment, skills and equipment, attitudes toward equipment, practical lessons and self confidence, survival techniques, and practical training is the "best part" of MEDA1. Participants believed that they gained substantial knowledge through the practical training sessions. They felt more

familiar with their equipment onboard and felt that they learnt to properly use it for survival. They believed that the physical training helped them realize how their body responded in the water and in an emergency, and therefore gained more confidence in dealing with emergencies. They learned survival techniques that they did not know before the course and felt that this increased their confidence in their possibility of survival.

**Theme 1: Knowledge of Equipment.** Most participants were unaware of the correct procedures for putting on suits/life jackets and how to get into the water wearing them. Deploying life rafts, turning over an upturned raft and getting into the raft directly from water required some practical experience that participants did not know. These experiences were new to them and had they not undergone the training, they believed that they would not have been able to respond to an emergency situation. For example:

*Participant: We had… I had life jackets now aboard the boat… a PFD… but never more or less put it on, but the proper way of putting it on when you get in the water and the same thing with the suit – and the raft – you use the raft now to get in it upright. There's a lot of stuff like that I didn't know. I wouldn't even have a clue before so…*

And also:

*Participant: Now basically I did… you saw these rafts on the boat but we didn't see them operate it or anything else. You know, I thought, you know, you would take these straps off and you leave them and just hang the thing overboard.*

**Theme 2: Skills and equipment.** Participants had not tried or tested most of their equipment prior to the training. They had also not tried wearing survival suits in the water. Survival suits give better protection and increase potential survival time in cold water compared to a lifejacket (which is the minimum requirement onboard). By trying on a range of different kinds of equipment during the MEDA1 training, they felt that they were given the opportunity to experience the difference in quality and comfort for themselves and get a better feel for the equipment. For example:

*Participant: Yeah, just to experience it in the water with nothing – just even with the life jacket, you know, compared to using the suit – you wouldn't give a second thought now in regards to getting a suit.*

And another example was:

*Participant: Well, you got a better understanding how to handle them, that's for sure – darn right.*

*Participant: I got awful taken in though on those fire extinguishers. Boy, I really thought there was more stuff in them than what's in them…*

**Theme 3: Attitudes toward equipment**. Post-training participants developed a better understanding of their life saving equipment. Even though they were compliant with safety regulations prior to the course and kept the minimum required equipment onboard, they were often apprehensive about using it or they did not trust its effectiveness. Not only did their training familiarize them with the equipment, it also helped them develop a sense of trust in their equipment. For example:

*Participant: You know, before coming here I had no idea at all what it would be like.*

*Participant: No.*

*Participant: I had a very mistrust of that survival suit and all that… life jacket would never float me but…I always thought it was something like we got onboard. We only got them life jackets. But I always thought it would be just as well take a rock in your hand as to jump out (laughter)*

**Theme 4: Practical lessons and self-confidence.** Putting on suits, deploying life rafts, using fire extinguishers were new experiences for most participants. Along with learning to operate safety equipment, another new lesson for them was the art of responding to an emergency quickly in adverse situations. Participants believed that the practical training helped them realize a self-potential that they would otherwise not have known. For example:

*Participant: Well, it's like... that's like in December, putting on a survival suit – I didn't think you could put it on in two minutes in the dark, but we did it.*

And also:

*Participant: I think, if nothing else, it gives us all more confidence. I think if we had to get in a situation, probably… I know I feel more confident because you know what to do now type of thing.*

**Theme 5: Survival techniques.** Part of the practical training involved learning survival techniques such as righting an overturned life raft and using safety equipment in the dark and so on. Most participants felt that these new techniques gave them an essential tool for survival and increased their confidence in preparing for emergencies. They felt that these new techniques were imperative in their line of work and that they increased the possibility of survival.

*Participant: I don't know. I certainly remember coming in over that raft – you know, front up like that. I've never seen that done before. I have one of those emergency suits. I'm after trying that on probably five or six times. I'm a bit familiar with that. I wasn't familiar with getting it on in the dark. (laughter) Now I can do it, you know; but uprighting that raft …..getting into the raft was something else.*

*Participant: Yeah.*

*Participant: Yeah, the same thing there like when you take him* (referring to life raft) *up… float him up to get him out of the water and that… that, you know…*

*Participant: Yeah.*

*Participant: Yeah.*

*Participant: …well then, if you didn't know how to do it or was never showed it you wouldn't know it. You'd say – fuck, I'm going to drown anyway. (laughter) There's more room for somebody else. (laughter)*

**Theme 6: Practical training is the "best part" of MEDA1.** Participants found practical training to be more educational and enjoyable than their classroom lessons. They felt that they learned a lot more by doing the tasks themselves than by hearing or seeing someone else do it. For example:

*Participant: Yeah. I thought it was a very good course. Specially all the hands on stuff. I mean you can sit in the classroom all day and read about stuff, but until you actually do it…*

*Participant: Hands on is about the best part.*

*Participant: And this is the stuff you will remember at the exact…*

And another example was:

*Participant: You know how to get on your suit. You know a lot of stuff – how you have to get on a life raft. We never seen that done before.*

*Participant: We know how to get in it.*

*Participant: When you've done something you'll remember it. If you just had read something, it would just go in and out.*

### 4.2.3 Category 3: Attitudes Toward Safety Training

*I wouldn't even have a clue before*

Six themes were identified that described changes in participants attitudes toward safety training including: pertinent training, discovering body skills, impact of training onboard a vessel, impact of training on awareness, shared responsibility and preparing for emergency. Participants described a change in attitudes toward the training both on the philosophical level (i.e., the regulatory mandate as noted above), and the practical usefulness of the program. They felt that they realized the implications of its usefulness, and that they had gained substantial new knowledge about themselves, their strengths and potentials, and the basic utilization of some of the safety equipment, which up until now, most of them had not used. They felt that their training had given them the capacity to be able to judge for themselves the usefulness and necessity of their safety equipment.

**Theme 1: Pertinent training.** Participants felt that their training helped them gain new knowledge that was necessary for them to perform their jobs safely. They felt that they would not have known how to react in an emergency had they not taken the course. They also felt that their training was relevant and applicable not only to their line of duty, but that it could also be applied in their daily life. Their training gave them necessary and pertinent information. For example:

*Participant: Do you remember…I told you that the we are discussing with the University to have a one day course to replace this three days course for the scientist…but in fact, I think, having gone through this course, I think it is not a good idea. I think doing the three days is absolutely necessary. Because we are totally ignorant! And just having….If it is not necessary at the boat it will be necessary at home! Anyway it is fantastic!*

And also:

*Participant: I mean if you go out now and she sinks, it means you have half a chance – more than you did before.*

**Theme 2: Discovering body skills.** Participants felt a positive change in themselves as a direct result of their training. They felt that they were able to do certain things that they had no knowledge or experience of before. Most participants had never been in the water and so they did not know, prior to their training, if their bodies would float or sink in water naturally. Discovering the limits and potentials of their own body was a major new lesson for them. For example:

*Participant: Well, climbing up the net now and up the ladder I didn't find hard, but keeping my feet down in the water. I found that hard because they always come up.*

And also:

*Participant: Now I wouldn't get in the water now without one of them suits on because I know I'm going to sink.*

**Theme 3: Impact of training onboard a vessel.** Post-training participants indicated that they would be making some serious safety changes onboard vessels as a direct result of their training. Their training made them think of the changes that were necessary ranging from buying specific safety equipment (that was above the minimum requirement) to maintaining safety equipment to ensuring that the crew were compliant with safety procedures. For example:

*Participant: Well, I said to him the other night, them emergency suits are on his boat four or five years, I suppose, and they were put on and put in a closet and they never came out since. So I told him after Christmas we're going to bring them down to the house… and they're probably all zippered up and… right? We'll haul them out and dry them out and stuff, right?*

And also:

*Participant: And before… before next summer, before the next fishing season is over, they'll be... the whole crowd aboard of my boat will be in the water with them ) on too.*

**Theme 4: Impact of training on awareness.** Participants felt that they were more conscientious as a result of their training. They felt that their training gave them an experiential knowledge about certain safety equipment and procedures that they would

otherwise not have acquired and this in turn made them more alert and vigilant. They felt a difference in their attitudes toward safety issues and claimed to be more proactive in dealing with hazard management. For example:

*Participant: It made me more aware of what.... and stuff like that on her because they may not be checked the equipment and all. They're not, I would say, on a regular basis. Now I'll be more... you'd better make sure that's ready, right?*

And another example was:

*Participant: I don't know – like other stuff that we need to put on a boat, but you know what I mean, it makes you realize how unsafe we truly are.*

**Theme 5: Shared Responsibility.** Instead of relying on the skipper for instructions, participants felt that their training made them realize the importance of everyone being vigilant about possible hazardous situations. Dealing with safety issues such as ensuring that the equipment is in working order or that it is kept in accessible places became a shared responsibility. Participants felt that their training gave them all equal knowledge and therefore equal responsibility about safety procedures. For example:

*Participant: They'd be more concerned, yes, and they'd be more aware of it too because there's nothing... there's nothing wrong with a crew member checking on a raft to make sure the raft is ok, right? Why does the crew member got to wait for the skipper to tell him to do it, right? Like he said, they should've... the crew member should say something... like come to the skipper and say: this is outdated. Let him...*

*Participant: If truth be known, the skipper shouldn't have to look around. There's enough people going around that boat to pass a look at the date on this or look at the date on that and come and let you know that it is outdated.*

*Participant: Yeah.*

And another example was:

*Participant: I can see where you definitely need everyone to be trained.*
*Participant: Yeah.*
*Participant: Yeah.*
*Participant: Everybody knows what to do for sure.*

**Theme 6: Preparing for emergency.** Participants felt that their training made them realize the importance of being prepared for an emergency and instead of leaving survival to fate, participants' attitudes toward emergency was to be prepared for it at all times. They described a change in their behaviour, perceptions and attitudes toward emergency preparedness. For example:

*Participant: It's a lot better to be prepared with jumping in with the suit on for the first time than having it in your locker in your bunk and saying… getting the call to say - get out now – because like even before, being on a boat, just taking it out we hardly ever took it out of the bag to look at it but now I'll take it out of the bag and make sure, right? Make sure it's going to fit and make sure that I don't have a leaky one. (chuckles)*

And another example was:

*Participant: It makes you more aware too like of different stuff on the boats, say… like when you get on her before – there's probably a mess on the deck – you just walk by it and just shove it off like; but now when you got on and you see it, you probably might straighten it up or something, right?*

### 4.2.4 Attitudes Toward Regulatory Requirements

*I'm a believer*

Five themes emerged in this category including: MEDA1 puts everyone on the same level of preparedness/response; change in attitudes toward the MEDA1 requirement; MEDA1 should be mandatory for all; MEDA3 is incomparable to MEDA1; and, expensive safety requirements. Post-training group discussions indicated there was a dramatic change in attitudes toward the regulatory requirement to complete the MEDA1. Participants felt that the training brought about a sense of shared knowledge and understanding – a baseline from which they could build a sense of trust in each other in terms of dealing with an emergency. They also acknowledged a change from feeling a strong repulsion towards the mandatory requirement to take the MEDA1 to being "happy" about being there. Having experienced the training first hand, they were able to judge the necessity and importance of the training as it related to their

occupational environment and conceded that it was necessary for all seafarers to undergo the training before embarking on sea. They suggested that the MEDA3 (which some participants had taken and could compare) be replaced by the MEDA1. In spite of fully endorsing the MEDA1, their concern of the expenses involved in fulfilling regulatory requirements remained strong.

**Theme 1: MEDA1 puts everyone on the same level of preparedness/response.** Participants believed that the MEDA1 training put everybody on the same level in terms of responding to an emergency. They felt that it helped them build trust in each other and felt strengthened by the knowledge that everybody onboard would be on the same level in terms of dealing with a hazardous situation. For example:

*Participant: Well, I found on the ship now onboard… I was on ( ) – it's only a fishing boat – but, you know, there's people coming from different backgrounds and nobody got the course. This course puts everybody pretty much on the same level of response and everybody has got the same ideas on how they're going to respond to that emergency.*

**Theme 2: Change in attitudes toward the MEDA1 requirement.** After they had undergone their training program, participants appreciated the requirement to complete the MEDA1. They felt that it was worth doing the course and that they had gained substantially. For instance:

*Participant: Well, actually, I probably wouldn't have come in; but now that I got it done, I would request someone to come in and do it. I probably wouldn't come in only because it was required – but it's nice to know*

And also:

*Facilitator: Well, coming in now one of you said you're here because it's required – mandatory. Does that still stand? How do you feel now?*

*Participant: I feel different about it now.*

*Participant: Yeah.*

*Participant: I mean it's a good learning experience. I learned a lot. Keep it fresh in your mind and the fishing season is not that far away again and I'll do things different altogether now.*

One participant summed it up:

*Participant: I'm a believer.*

**Theme 3: MEDA1 should be mandatory for all.** At the end of the three-day course, participants appreciated the benefits of their training to the extent that they felt that it should be mandatory for all seafarers. Participants who were new to the job and had not had any safety orientation onboard felt the benefit of this training even more. They believed that had they not undergone the training, they would not have known how to deal with a hazardous situation. In addition to learning how to respond to an emergency, participants felt that the training made them understand how little they had known about hazards and about emergency preparedness. For example:

*Participant: I think it went good. It was exciting and it's… I don't know….. (laughs) No, but you shouldn't be allowed to go to sea without knowing all this stuff. Like I did a couple of trips one time on this boat, the Ocean Concord; and when I first got on it, they never took me around to show me their… I think the skipper showed me the fire stations, but that was it. He never showed me like anything, really.*

*Facilitator: Yeah.*

*Participant: Right? And like if I had gone down then, I wouldn't have had a clue what I was doing because I never had any training.*

*Facilitator: Yeah.*
*Participant: Yeah, so everyone should be forced to do this.*

Another example was:

*Participant: If truth be known, we should've never been allowed out there without...*

*Participant: No, we should not have.*

**Theme 4: MEDA3 and MEDA1 are incomparable.** Some participants had previously participated in the MEDA3 course which is required of seafarers going out within a 25-mile radius. The MEDA3 delivered by the PFHCB is part of a larger apprenticeship course which includes first-aid and basic seamanship, however, it does not involve

practical training. The participants believed that the MEDA1 was more suited to the needs of all seafarers regardless of how far they travelled from shore. They felt that the MEDA3 was less effective as a training program and that they had learned a lot more in the MEDA1 training because it had practical training. For example:

*Participant: No, but it should for everybody – inside and all ( – the same course that we just took. If you're aboard a boat… you should have to take this exact same course if you're going fishing. I took the other one, but it was nowhere near like this one. It was a longer course but I learned a lot more here than I did in that course for five days*

Another example was:

*Participant: There was no hands-on, right. They're looking at structural training and no hands-on with it. Well, you told us a lot of stuff; but when we see it, it was different.*

*Participant: Hands-on stuff is a lot better.*

**Theme 5: Expensive Safety Requirements.** This was a common theme in both pre- and post-training group discussions. They were frustrated with all of the fees associated with the new regulations and believed that the overall cost resulting from meeting all of these regulatory requirements was substantial. For instance:

*Participant: I mean for example, like the physical, right? I mean my money – 80 bucks – and ten minutes in an office is a bit steep in my opinion, you know.*

And another example was:

*Participant: But like I say, anyone with a big boat… like I said, that I have two of those. Then there's boat insurance. Then it's your dockside monitoring. Then it's the observer fees. If you do calculate it all up, you'd be surprised what you pay out in a year.*

### 4.2.5 Recommendations

*You could probably have a group of 25 or 30 and a fellow just come in and go through all this again just to… (snaps fingers for emphasis) that in your mind, right?*

Participants recommended that everybody going out to sea complete the MEDA1 course. They believed that there should be no difference in training between the inshore (less than 25 miles) and offshore (more than 25 miles) seafarers. In addition to training

all seafarers, participants also recommended that the MEDA1 training be given to the seafarers' family members to help raise wider community awareness. Having tested some of the equipment onboard, participants also recommended that the survival suit be made a regulatory requirement since they felt that it gave better protection than a life jacket (which is the minimum requirement). In addition to the current MEDA1 training outline, participants also recommended the inclusion of first aid training. They felt that dealing with an emergency situation would potentially require dealing with injured persons, therefore some knowledge of first aid was necessary and thus it needs to be included in the emergency preparedness training program. Some participants in the enhanced group found the instructional safety video clips to be outdated and recommended showing more relevant clips. Participants also strongly recommended implementing refresher MEDA1 courses. They felt that the knowledge gained during their 3-day would need to be refreshed over time to get the maximum benefit.

**Theme 1: Community Awareness.** Fishing is a family tradition. Post-training participants felt that the MEDA1 training should be extended to all other family members of fish harvesters even those who were NOT going out to sea. They felt that involving the larger community would increase safety awareness of the community as a whole and also exert a stronger influence on other harvesters to complete MEDA1. They believed that the training would also help them manage their fear.

*Participant: Sometimes too… this course should be opened to not just the fisher people who are on the boat, but maybe to extended family – because I'm sure that if your girlfriend or your wife or… knew what… you know, what can happen – who knows; they could light a fire under them and say, you know, this should be done. I mean when my husband leaves the wharf in the morning, it's him and my three sons on the boat. So I mean… and like mentality just goes into overdrive. You're picturing stuff happening and coming… and sometimes we're all out there – the five of us, right – and I mean you try not to think negative, but you're wondering like, you know.*

**Theme 2: Same MEDA1 course for all.** Participants who underwent the MEDA3 course (the training recommended for boats within the 25 mile zone) and could compare their experiences with the MEDA1 course felt that everybody going out to sea should take the MEDA1. The MEDA3 delivered by the PFHCB is part of a larger apprenticeship course. And, although it includes basic seamanship and first-aid training they felt that because the MEDA3 lacked practical training sessions it was insufficient to prepare seafarers for emergencies. For example:

*Participant: …that whether you're 100 miles offshore or 1 mile offshore, you still can't swim. You still got to know how to get in them suits and get in out of the way…*

*Participant: That's right.*

*Participant: …because that's still survival. Even though you're mile in and you see the land, you're still not going…*

And another example was:

*Participant: One thing I'd like the government…there's one thing I'd like the government to change is the requirement should… this course itself should've been required for all fishermen, no matter how far a distance you go. I'd really like to see that – everybody got the same course – and I said that from day one. Should be offered at…the extent that we just did. Shouldn't be no less…so now we're after learning a nice bit so it shouldn't be no less.*

**Theme 3: Include first aid with MEDA1.** Participants felt that part of learning to deal with emergency and survival at sea was also learning to take care of medical emergencies such as dealing with an injured person onboard a life raft. They recommended some first aid training be included in the MEDA1 to complete it as emergency preparedness training. For example:

*Participant: Yeah, I'd recommend that - should be a little bit of first aid – touch a bit on first aid.*

*Participant: If they're burned by fire or if they're cut by something, then if you weren't trained, I suppose, what to do with that, right.*

And another example was:

*Participant: You know, even the MED-13.... like the first course I done – I mean even some of the first aid and just knowing – well, if this happens, this is what you should do now – I'd be able to implement it with something else. Like you said, you don't know unless you're in the situation, how you're going to react, right?*

**Theme 4: Mandatory Survival Suits.** Post-training participants felt that a survival suit was better suited to their needs than a life jacket. One of the changes they would like to see is the mandatory implementation of the survival suit. Despite the cost (and despite arguing against the implementation of new rules, and newer safety equipment that they had come to see as "regular hurdles" of the current fishing industry) they felt that survival suits were appropriate to their needs and would be a wise investment. For instance:

*Participant: I think those suits – those survival suits – they should be mandatory for everybody. Five or six hundred bucks – they're there for years and years and years, if you just look after them they'll save your life.*

*Participant: It's not much for..*

*Participant: It's not a big investment.*

*Participant: No.*

*Participant: ...like over... however many years you got left in the fishery – 10... 15 or whatever it is.*

*Participant: Yeah.*
Another example:

*Participant: That should come down to government too. I mean some things you got... you got... right now you're ticketed if you haven't got your seatbelt on, right, but we can go on a fishing job without a suit*

**Theme 5: So-so video clips.** Participants were indifferent toward the video clips shown during class. While some felt that the clips were informative, others felt that some of the lessons were not applicable to the size of their boat or that the material shown was out of date. For example one said:

*Participant: A lot of those clips though seem dated. A lot of that stuff looks pretty old. I'm sure you can come up with newer...*

And another said:

*Participant: I think a lot of the video clips too the kind of stuff that we're not going to look at anyway – like on big boats.*

**Theme 6: MEDA1 Refresher Courses.** Participants recommended a refresher MEDA1 training course. They recommended that the refresher version could be shortened to only include the practical training. They believed that the practical training was very important and pertinent to their work and that it needed to be rehearsed over time.

*Facilitator: And then just to wrap this up, how has this changed your perception of training? And going away now, do you feel that you…*

*Participant: Well, definitely think that it should be taught more…*

*Participant: Oh yeah.*

*Participant: And every so often get an update.*

*Participant: Yeah. It wouldn't hurt. Well, at least then…*

*Participant: And I wouldn't think you wouldn't… you probably wouldn't have to do it as such as a small class. You could probably have a group of 25 or 30 and a fellow just come in and go through all this again just to… (snaps fingers for emphasis) that in your mind, right? Like you don't have to go back to the classroom, right; and then, if you had a couple… like we got three fellows here, so if you had 25 or 30, then go over so much. You take so many and just throw them in the water and just… (laughter)*

### 4.3 Common Findings: Pre- and Post-Training Attitudes Toward the Fishery

*Nobody else is going to get into it.*

Five themes emerged as a common concern in both pre- and post-training discussions regarding the fishery. These were: no future in the fishery, discouraging the fishery as a future option, comprehensive professional work jobs and no more 'work jobs', instability and having a fall back option and no safety training funds for teenagers. Participants perceived the industry as dying out. They could not see a future in the fishery to

encourage the next generation. They felt that the demand in the fishing industry was shifting towards a more professional occupation and that fishing as it used to be was dying out. They felt frustrated by this change and felt that they must now find alternative sources of income. They discouraged the next generation from entering the fishery and those who were involved were being encouraged to have an exit strategy or at least a fall back option. Additionally, participants were finding it hard to train their next generation since, traditionally, youngsters are trained on the job but they are not able to take them onboard anymore since there are no safety training funds for teenagers.

**Theme 1: No Future in the Fishery.** Participants could not see a future in the fishery anymore. They felt that their generation was the last one and that the younger generation would not be taking the same road into the fishery as they had:

*Participant: My opinion now – once our class goes, that's it! because the way the fishery is going now it's… nobody else is going to get into it.*

*Participant: There are so many factors there involved with the way it's going and that, I can't see a lot of young people going down the same road we're after going down. I can't see it. It might be different.*

**Theme 2: Discouraging the fishery as a future option.** Participants felt that the fishery was riddled with obstacles and that every year there were new regulations and hurdles to deal with. Realizing the hardship and uncertainty of the fishery, participants encouraged their children into education and other areas.

*Participant: That's like my daughter – like every day when she goes to school, I says get your education because you got to get out of Newfoundland, and a lot of people is like that now because there's nothing here, right? So I can't see other people going doing… getting into the fishery.*

*Participant: Well, there's the part… well, what you go through every year. You know, every year there's something new coming up and it's another obstacle you got to try to cross, you know. So, like I said, people coming out – especially the younger people – they're more or less… they're not going to do… I guess, going on the road like we're at, right? I can't see them anyway.*

**Theme 3: Competitive professional options and no more 'work jobs'.** Part of the problem with encouraging young people into the fishery was the booming oil industry. Participants felt the drain on their population as more and more of the younger generation were attracted to the newer industry. Additionally, the labour market was changing such that it demanded more professionals with academic background. One participant described manual labour as 'work job' and how there was less demand for labour intensive work such as fishing.

*Participant: It seems like more… the younger crowd now out of school and coming out of school are all going for the oil jobs.*

*Participant: yeah.*

*Participant: It seems to be taking over a lot from the fishery now.*

*Participant: One time now, it was like an electrician or plumber. There's none of that now. You're a mechanical engineer. You're an electrical engineer. That's what everyone goes by, right? There's none of these….I call them 'work jobs'.*

**Theme 4: Instability and Fallback options.** Due to the uncertain nature of the fishery, fish harvesters were encouraging the next generation who are employed in the fishery to get an alternative career as a fallback option for when the fishery fails again.

*Participant: Like I mean you got… the average I'd say now are late 40's, early 50's. That's what's left; and the way everything is going now in this fishery, there's no next generation. Like there's no… there's not going to be no encouragement from like husbands and wives or fathers and mothers to encourage their children to go into this because there's no stability there. So like the biggest thing is fear. I mean…*

*Participant: You are almost turned off now.*

*Participant: Yes. You're encouraging them not into it – to go into another field – and it's scary because the majority of them… I mean I got three sons who love it on the water, but we couldn't with all conscience encourage them to go into without something behind them to back them up for when this fails again.*

**Theme 5: No safety training funds for teenagers.** Fish harvesters are trained on the job from a very young age. This helps to keep earnings within the family unit and it gives

children an understanding of their way of life and an appreciation of their parents' work. However, as the MEDAI is mandatory for all onboard, and there are no funding for young adults to participate in MEDAI, families were finding it hard to take them out to work and to train them at sea. For instance one participant said:

*Participant: Okay – because that's where like the majority of the people that are doing this course are sponsored. Right? So anyone that's 14, 15, 16 is out of pocket but where you're losing… where the participation is being lost is the funding part. You got to be EI eligible in order to be funded, right?*

And also:

*Participant: Because I called about my son – the 16-year-old – because I would've loved for him to do it. Now the other two… my other two children done it through the Marine Institute with the courses that they done, right; but they told me that he was too young.*

# CHAPTER 5

## Questionnaire findings

### 5.1.1 Gender, Age & Experience at Sea

A total of 94 students of MED.A1 participated in this study (Table 5.1.1). There were 80 men and 14 women participants with a mean age of 41.5 years, ranging from 18 to 62 years (s.d. 11.07). The number of females in individual groups and in total was significantly lower than the number of males ($p<0.001$). There was no significant relationship between gender and group ($p>0.05$). The mean years of experience at sea was 16 years (s.d. 11.43) with some participants having no experience at all, whilst others had had up to 46 years of experience. The enhanced group consisted of 46 participants whilst the standard group consisted of 48 participants. There was no significant difference between the enhanced and standard group with respect to gender attribution, mean age, mean years of experience at sea or the number of participants in each group.

**Table 5.1.1: Gender, Age & Experience at Sea**

| | | Enhanced | Standard | Total |
|---|---|---|---|---|
| **Gender**[a] | % Male (N) | 91.3 (42) | 79.2 (38) | 85.1 (80)[b] |
| | % Female (N) | 8.7 (4) | 20.8 (10) | 14.9 (14) |
| **Age**[c] | Mean | 41.26 | 41.73 | 41.5 |
| | Standard Deviation | 11.6 | 10.66 | 11.07 |
| | Minimum | 22 | 18 | 18 |
| | Maximum | 61 | 62 | 62 |
| **Years of Experience at Sea**[d] | | | | |
| | Mean | 17.36 | 15.19 | 16.27 |
| | Standard Deviation | 11.59 | 11.3 | 11.43 |
| | Minimum | 0 | 0 | 0 |
| | Maximum | 45 | 46 | 46 |
| **% Total Participants (N)**[e] | | **48.9 (46)** | **51.1 (48)** | **100 (94)** |

a. There is no significant relationship between gender and group ($\chi^2=2.73$, $p> 0.05$, d.f.=1)

b. Total number of males is significantly higher than the total number of females ($\chi^2=46.34$, $p<0.001$, d.f.=1)

c. No significant difference in mean age between the two groups (2 tailed t-test; $t = 0.201$, $p>0.05$, d.f.=85)

d. No significant difference in mean years of experience at sea between the two groups (two tailed t-test; $t=-0.898$, $p>0.05$, d.f.=88)

e. No significant difference in the number of participants between the two groups ($\chi^2=0.043$, $p>0.05$, d.f.=1)

### 5.1.2. Occupation

Proportion of fish harvesters (81%) in the study was significantly higher than all other occupations combined ($\chi^2$=37.43, d.f.=1, p<0.001; Table 5.1.2). Non-fish harvesters included the 'seafarer' category and the 'other' category of participants. Participants who checked the 'other' category described themselves as research scientists working with the DFO in offshore vessels, fisheries scientist, shore captain, researcher, an ordinary seaman and a marine geologist. A significant proportion of participants (79%) worked in boats larger than 35 feet ($\chi^2$=42.77, d.f.=1, p<0.001) and the proportion of crew (63%) was significantly higher than a combination of proportions of skipper, both skipper and crew and those who described themselves as other ($\chi^2$=6.128, d.f.=1, p<0.05).

**Table 5.1.2: Occupation**

| | % Enhanced (N) | % Standard (N) | % Total (N) |
|---|---|---|---|
| **Principal Occupation** | | | |
| Fish Harvester | 76.1 (35) | 85.4 (41) | 80.9 (76)[a] |
| Seafarer | 4.3 (2) | 10.4 (5) | 7.4 (7) |
| Other | 17.4 (8) | 4.2 (2) | 10.6 (10) |
| Missing | 2.2 (1) | 0 | 1.1 (1) |
| **Role on the Vessel** | | | |
| Crew | 60.9 (28) | 64.6 (31) | 62.8 (59)[b] |
| Skipper | 19.6 (9) | 20.8 (10) | 20.2 (19) |
| Both | 4.3 (2) | 2.1 (1) | 3.2 (3) |
| Other | 15.2 (7) | 12.5 (6) | 13.8 (13) |
| **Size of Boat** | | | |
| Less than 35 feet | 17.4 (8) | 10.4 (5) | 13.8 (13) |
| More than 35 feet | 78.3 (36) | 79.2 (38) | 78.7 (74)[c] |
| Both | 2.2 (1) | 10.4 (5) | 6.4 (6) |
| Missing | 2.2 (1) | 0 | 1.1 (1) |
| **Total Participants** | **48.9 (46)** | **51.1 (48)** | **100 (94)** |

a. Total number of Fish Harvesters was significantly higher than all other occupations ($\chi^2$=37.43, d.f.=1, p<0.001)

b. Total number of crew was higher than all other role on vessel ($\chi^2$=6.128, d.f.=1, p<0.05)

c. There were significantly higher number of boats that were more than 35 feet ($\chi^2$=42.77, d.f.=1, p<0.001)

## 5.2 Accident causes

Analyses of internal/behavioural, external/situational and other causes of accidents at sea are presented below (Tables 5.2.1, 5.2.2 and 5.2.3 respectively). Respondents in the enhanced group show a significant difference in two internal/behavioural items (rushing, level of safety training) and three external/situational items (slippery deck, stress, experience of crew). In contrast, respondents in the standard group show significant difference in only one internal item (speeding) and one external item (boat size). Group difference in responses is not statistically significant.

### 5.2.1. Perceptions of Importance of Internal/Behavioural Items

Table 5.2.1 identifies the proportion of participants in each group before and after the intervention who described the 10 internal causes as very important, important, slightly important or not important. It shows more than three quarters of the participants perceived alcohol, overloading and carelessness as very important behavioural factors that caused accidents at sea both prior to and after their training (similar to Murray & Dolomount, 1994). There was an increase in the number of participants, after the training, who rated rushing, level of safety training and overpowering/speeding the boat as very important behavioural factors that caused accidents at sea (similar to Murray & Dolomount, 1994). The former two internal/behavioural factors were significant for the enhanced group while the latter was significant for the standard group. Also, there was an increase in the proportion of participants who perceived 'safety awareness of self' in the enhanced group as an important contributory factor toward accident causation; although, this was not statistically significant.

**Table 5.2.1 Pre- and Post-Training Score Differences in Internal/Behavioural Perceptions Items**

| Perceptions | Before | | | | | After | | | | | Wilcoxon test two-tailed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INTERNAL BEHAVIORAL | % Very Imp. (N) | % Imp. (N) | % Slightly Imp. (N) | % Not Imp.(N) | Mean score | % Very Imp. (N) | % Imp. (N) | Slightly Imp. (N) | % Not Imp. (N) | Mean score | Z | *p* |
| Alcohol | | | | | | | | | | | | |
| Standard | 89.6 (43) | 0 | 2.1 (1) | 6.3 (3) | 3.77 | 85.4 (41) | 8.3 (4) | 2.1 (1) | 4.2 (2) | 3.75 | -0.142c | 0.887 |
| Enhanced | 89.1 (41) | 6.5(3) | 2.2 (1) | 2.2 (1) | 3.83 | 87 (40) | 10.9 (5) | 2.2 (1) | 0 | 3.85 | 0.000a | 1.000 |
| Overloading | | | | | | | | | | | | |
| Standard | 85.4 (41) | 12.5 (6) | 0 | 2.1 (1) | 3.81 | 91.7 (44) | 6.3 (3) | 2.1 (1) | 0 | 3.90 | -0.832c | 0.405 |
| Enhanced | 89.1 (41) | 8.7 (4) | 2.2 (1) | 0 | 3.87 | 76.1 (35) | 19.6 (9) | 4.3 (2) | 0 | 3.72 | -1.658b | 0.097 |
| Carelessness | | | | | | | | | | | | |
| Standard | 81.3 (39) | 10.4 (5) | 4.2 (2) | 2.1 (1) | 3.74 | 79.2 (38) | 16.7 (8) | 2.1 (1) | 2.1 (1) | 3.73 | -0.206b | 0.837 |
| Enhanced | 76.1 (35) | 17.4 (8) | 2.2 (1) | 0 | 3.77 | 73.9 (34) | 23.9 (11) | 0 | 0 | 3.76 | -0.277b | 0.782 |
| Overworking | | | | | | | | | | | | |
| Standard | 68.8 (33) | 31.3 (15) | 0 | 0 | 3.69 | 70.8 (34) | 22.9 (11) | 4.2 (2) | 0 | 3.68 | 0.000a | 1.000 |
| Enhanced | 52.2 (24) | 37 (17) | 10.9 (5) | 0 | 3.41 | 52.2 (24) | 43.5 (20) | 4.3 (2) | 0 | 3.48 | -0.632c | 0.527 |
| Tiredness | | | | | | | | | | | | |
| Standard | 62.5 (30) | 27.1 (13) | 6.3 (3) | 2.1 (1) | 3.53 | 66.7 (32) | 27.1 (13) | 6.3 (3) | 0 | 3.60 | -0.975c | 0.329 |
| Enhanced | 69.6 (32) | 21.7 (10) | 8.7 (4) | 0 | 3.61 | 54.3 (25) | 34.8 (16) | 6.5 (3) | 0 | 3.50 | -1.291b | 0.197 |
| Overpowering/ Speeding | | | | | | | | | | | | |
| Standard | 56.3 (27) | 27.1 (13) | 10.4 (5) | 6.3 (3) | 3.33 | 70.8 (34) | 20.8 (10) | 6.3 (3) | 2.1 (1) | 3.60 | -2.275c | 0.023 |
| Enhanced | 47.8 (22) | 28.3 (13) | 13 (6) | 10.9 (5) | 3.13 | 56.5 (26) | 23.9 (11) | 13 (6) | 6.5 (3) | 3.30 | -1.734c | 0.083 |
| Rushing | | | | | | | | | | | | |
| Standard | 47.9 (23) | 29.2 (14) | 16.7 (8) | 6.3 (3) | 3.19 | 54.2 (26) | 31.3 (15) | 10.4 (5) | 4.2 (2) | 3.35 | -1.109c | 0.268 |
| Enhanced | 32.6 (15) | 41.3 (19) | 21.7 (10) | 4.3 (2) | 3.02 | 45.7 (21) | 39.1 (18) | 10.9 (5) | 2.2 (1) | 3.31 | -2.090c | 0.037 |
| Sickness | | | | | | | | | | | | |
| Standard | 39.6 (19) | 29.2 (14) | 20.8 (10) | 5 (10.4) | 2.98 | 41.7 (20) | 33.3 (16) | 20.8 (10) | 2 (4.2) | 3.13 | -1.286c | 0.198 |
| Enhanced | 32.6 (15) | 34.8 (16) | 21.7 (10) | 8.7 (4) | 2.93 | 37 (17) | 34.8 (16) | 28.3 (13) | 0 | 3.09 | -0.952c | 0.341 |
| Safety awareness | | | | | | | | | | | | |

| Perceptions INTERNAL BEHAVIORAL | Before | | | | | After | | | | | Wilcoxon test two-tailed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Very Imp. (N) | % Imp. (N) | % Slightly Imp. (N) | % Not Imp.(N) | Mean score | % Very Imp. (N) | % Imp. (N) | Slightly Imp. (N) | % Not Imp. (N) | Mean score | Z | *p* |
| self | | | | | | | | | | | | |
| Standard | 81.3 (39) | 18.8 (9) | 0 | 0 | 3.81 | 79.2 (38) | 16.7 (8) | 4.2 (2) | 0 | 3.75 | -0.728b | 0.467 |
| Enhanced | 67.4 (31) | 32.6 (15) | 0 | 0 | 3.67 | 82.6 (38) | 17.4 (8) | 0 | 0 | 3.83 | -1.941c | 0.052 |
| Level safety training | | | | | | | | | | | | |
| Standard | 72.9 (35) | 22.1 (11) | 2.1 (1) | 2.1 (1) | 3.67 | 75 (36) | 20.8 (10) | 4.2 (2) | 0 | 3.71 | -0.318c | 0.751 |
| Enhanced | 58.7 (27) | 39.1 (18) | 2.2 (1) | 0 | 3.57 | 80.4 (37) | 17.4 (8) | 2.2 (1) | 0 | 3.78 | -2.310c | 0.021 |
| Differences in total scores | | | | | | | | | | | | |
| Standard | | | | | | | | | | | -1.098a | 0.272 |
| Enhanced | | | | | | | | | | | -0.703 | 0.482 |

a The sum of negative ranks equal the sum of positive ranks
b Based on positive ranks
c Based on negative ranks

### 5.2.2. Perceptions of Importance of External/Situational Items

Table 5.2.2 identifies the proportion of participants in each group before and after the intervention who described the 10 external causes as very important, important, slightly important or not important in accident causation. More than two thirds of the pre-training participants from the enhanced group perceived rough sea and safety awareness of crew as very important factors while more than three quarters from the standard group perceived rough sea, safety awareness of crew and slippery deck as very important factors in causing accidents at sea (similar to Murray & Dolomount, 1994). After the training, more than two-thirds from both groups perceived rough sea, slippery deck, poor safety regulations, untidy deck, safety awareness of crew and lack of a safety culture to be very important factors in causing accidents. Three items showed a significant increase in the enhanced group: stress, slippery deck and experience of crew while one item showed a significant decrease in perceived importance in the standard group: size of boat.

**Table 5.2.2. Pre- and Post-Training Score Differences in External/Situational Perceptions Items**

| Perceptions EXTERNAL SITUATIONAL | Before | | | | | After | | | | | Wilcoxon test two-tailed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Very Imp. (N) | % Imp. (N) | % Slightly Imp. (N) | % Not Imp.(N) | Mean score | % Very Imp. (N) | % Imp. (N) | Slightly Imp. (N) | % Not Imp. (N) | Mean score | Z | *p* |
| Rough Sea | | | | | | | | | | | | |
| Standard | 77.1 (37) | 18.8 (9) | 0 | 2.1 (1) | 3.74 | 66.7 (32) | 29.2 (14) | 2.1 (1) | 2.1 (1) | 3.60 | -1.216b | 0.224 |
| Enhanced | 69.6 (32) | 26.1 (12) | 4.3 (2) | 0 | 3.65 | 73.9 (34) | 17.4 (8) | 8.7 (4) | 0 | 3.65 | 0.000a | 1.000 |
| Slippery deck | | | | | | | | | | | | |
| Standard | 75 (36) | 18.8 (9) | 0 | 2.1 (1) | 3.74 | 75 (36) | 22.9 (11) | 2.2 (1) | 0 | 3.73 | -0.378c | 0.705 |
| Enhanced | 56.5 (26) | 34.8 (16) | 6.5 (3) | 0 | 3.51 | 76.1 (35) | 21.7 (10) | 2.2 (1) | 0 | 3.74 | -2.357c | 0.018 |
| Poor safety regulations | | | | | | | | | | | | |
| Standard | 64.6 (31) | 22.9 (11) | 6.3 (3) | 6.3 (3) | 3.46 | 70.8 (34) | 22.9 (11) | 4.2 (2) | 2.1 (1) | 3.63 | -1.370c | 0.171 |
| Enhanced | 54.3 (25) | 32.6 (15) | 10.9 (5) | 2.2 (1) | 3.39 | 63 (29) | 30.4 (14) | 6.5 (3) | 0 | 3.57 | -1.228c | 0.219 |
| Untidy Deck | | | | | | | | | | | | |
| Standard | 64.6 (31) | 25 (12) | 2.1 (1) | 4.2 (2) | 3.57 | 66.7 (32) | 20.8 (10) | 6.3 (3) | 4.2 (2) | 3.53 | -0.028b | 0.978 |
| Enhanced | 60.9 (28) | 26.1 (12) | 6.5 (3) | 0 | 3.58 | 71.7 (33) | 19.6 (9) | 6.5 (3) | 0 | 3.67 | -1.069c | 0.285 |
| Stress | | | | | | | | | | | | |
| Standard | 52.1 (25) | 39.6 (19) | 4.2 (2) | 4.2 (2) | 3.40 | 60.4 (29) | 29.2 (14) | 8.3 (4) | 2.1 (1) | 3.48 | -0.676c | 0.499 |
| Enhanced | 37 (17) | 43.5 (20) | 13 (6) | 2.2 (1) | 3.20 | 56.5 (26) | 32.6 (15) | 10.9 (5) | 0 | 3.46 | -2.828c | 0.005 |
| Bad Luck | | | | | | | | | | | | |
| Standard | 8.3 (4) | 18.8 (9) | 14.6 (7) | 58.3 (28) | 1.77 | 14.6 (7) | 18.8 (9) | 4.2 (2) | 62.5 (30) | 1.85 | -0.579c | 0.563 |
| Enhanced | 8.7 (4) | 6.5 (3) | 28.3 (13) | 56.5 (26) | 1.67 | 4.3 (2) | 10.9 (5) | 28.3 (13) | 56.5 (26) | 1.63 | -0.284b | 0.776 |
| Experience of Crew | | | | | | | | | | | | |
| Standard | 62.5 (30) | 31.3 (15) | 0 | 6.3 (3) | 3.50 | 64.6 (31) | 14.6 (7) | 12.5 (6) | 6.3 (3) | 3.40 | -0.584b | 0.559 |
| Enhanced | 65.2 (30) | 26.1 (12) | 6.5 (3) | 0 | 3.60 | 41.3 (19) | 47.8 (22) | 8.7 (4) | 2.2 (1) | 3.28 | -2.480b | 0.013 |
| Safety awareness | | | | | | | | | | | | |

| Perceptions EXTERNAL SITUATIONAL | Before | | | | | After | | | | | Wilcoxon test two-tailed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Very Imp. (N) | % Imp. (N) | % Slightly Imp. (N) | % Not Imp.(N) | Mean score | % Very Imp. (N) | % Imp. (N) | Slightly Imp. (N) | % Not Imp. (N) | Mean score | Z | *p* |
| crew | | | | | | | | | | | | |
| Standard | 79.2 (38) | 18.8 (9) | 2.1 (1) | 0 | 3.77 | 72.9 (35) | 20.8 (10) | 6.3 (3) | 0 | 3.67 | -1.127b | 0.260 |
| Enhanced | 69.6 (32) | 30.4 (14) | 0 | 0 | 3.70 | 80.4 (37) | 19.6 (9) | 0 | 0 | 3.80 | -1.667c | 0.096 |
| Lack of a safety culture | | | | | | | | | | | | |
| Standard | 58.3 (28) | 29.2 (14) | 8.3 (4) | 4.2 (2) | 3.42 | 66.7 (32) | 18.8 (9) | 8.3 (4) | 6.3 (3) | 3.46 | -0.380c | 0.704 |
| Enhanced | 52.2 (24) | 37 (17) | 8.7 (4) | 0 | 3.44 | 71.7 (33) | 17.4 (8) | 8.7 (4) | 0 | 3.64 | -1.708c | 0.088 |
| Boat size | | | | | | | | | | | | |
| Standard | 58.3 (28) | 27.1 (13) | 8.3 (4) | 4.2 (2) | 3.43 | 43.8 (21) | 25 (12) | 16.7 (8) | 12.5 (6) | 3.02 | -2.143b | 0.032 |
| Enhanced | 54.3 (25) | 23.9 (11) | 13 (6) | 8.7 (4) | 3.24 | 37 (17) | 37 (17) | 19.6 (9) | 6.5 (3) | 3.04 | -1.519b | 0.129 |
| Differences in total scores | | | | | | | | | | | | |
| Standard | | | | | | | | | | | -0.970b | 0.332 |
| Enhanced | | | | | | | | | | | -0.977 | 0.329 |

a The sum of negative ranks equal the sum of positive ranks
b Based on positive ranks
c Based on negative ranks

### 5.2.3. Perceptions of Importance of Other Perception Items

Table 5.2.3 shows the proportion of participants in each group who identified the five other items of perception as either very important, important, slightly important or not important in causing accidents at sea. Although none of the results shows any significant difference between the pre-and post-training scores, more than half of the pre- and post-training participants from both groups thought that the colour of boat and individual's height were not important in causing accidents at sea.

**Table 5.2.3 Pre- and Post-Training Score Differences of Other Perceptions Items**

| Perceptions OTHER | Before | | | | | After | | | | | Wilcoxon test two-tailed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Very Imp. (N) | % Imp. (N) | % Slightly Imp. (N) | % Not Imp.(N) | Mean score | % Very Imp.(N) | % Imp. (N) | % Slightly Imp. (N) | % Not Imp. (N) | Mean score | Z | *p* |
| Water temperature | | | | | | | | | | | | |
| Standard | 39.6 (19) | 16.7 (8) | 16.7 (8) | 27.1 (13) | 2.69 | 27.1 (13) | 18.8 (9) | 12.5 (6) | 41.7 (20) | 2.31 | -1.889b | 0.059 |
| Enhanced | 23.9 (11) | 19.6 (9) | 23.9 (11) | 32.6 (15) | 2.35 | 32.6 (15) | 19.6 (9) | 23.9 (11) | 21.7 (10) | 2.64 | -1.317c | 0.188 |
| Type of Fish | | | | | | | | | | | | |
| Standard | 31.3 (15) | 37.5 (18) | 16.7 (8) | 14.6 (7) | 2.85 | 20.8 (10) | 31.3 (15) | 18.8 (9) | 29.2 (14) | 2.44 | -1.901b | 0.057 |
| Enhanced | 13 (6) | 34.8 (16) | 28.3 (13) | 21.7 (10) | 2.40 | 15.2 (7) | 21.7 (10) | 34.8 (16) | 28.3 (13) | 2.24 | -1.186b | 0.236 |
| Time of Day | | | | | | | | | | | | |
| Standard | 20.8 (10) | 50 (24) | 8.3 (4) | 20.8 (10) | 2.71 | 31.3 (15) | 35.4 (17) | 10.4 (5) | 22.9 (11) | 2.75 | -0.286c | 0.775 |
| Enhanced | 21.7 (10) | 28.3 (13) | 26.1 (12) | 21.7 (10) | 2.51 | 17.4 (8) | 28.3 (13) | 34.8 (16) | 19.6 (9) | 2.43 | -0.224b | 0.823 |
| Boat colour | | | | | | | | | | | | |
| Standard | 6.3 (3) | 10.4 (5) | 16.7 (8) | 66.7 (32) | 1.56 | 10.4 (5) | 12.5 (6) | 6.3 (3) | 66.7 (32) | 1.65 | -0.680c | 0.496 |
| Enhanced | 4.3 (2) | 13 (6) | 19.6 (9) | 63.0 (29) | 1.59 | 4.3 (2) | 15.2 (7) | 13 (6) | 67.4 (31) | 1.57 | -0.188b | 0.851 |
| Your height | | | | | | | | | | | | |
| Standard | 4.2 (2) | 6.3 (3) | 25 (12) | 62.5 (30) | 1.51 | 4.2 (2) | 16.7 (8) | 18.8 (9) | 60.4 (29) | 1.65 | -1.185c | 0.236 |
| Enhanced | 4.3 (2) | 8.7 (4) | 26.1 (12) | 60.9 (28) | 1.57 | 4.3 (2) | 8.7 (4) | 26.1 (12) | 60.9 (28) | 1.57 | -0.082c | 0.935 |

a The sum of negative ranks equal the sum of positive ranks

b Based on positive ranks

c Based on negative ranks

### 5.2.4 Differences Between Group Scores

Comparison of post-training perceptions scores between the enhanced and standard groups shows no significant difference in either the internal or external perceptions scores ($p>0.05$; Table 5.2.4).

**Table 5.2.4: Group Differences in Internal and External Post-Training Perceptions Scores**

| Post-training Perceptions Scores | | N | Mean Rank | Sum of Ranks | Z | Mann Whitney U 2-tailed p |
|---|---|---|---|---|---|---|
| Internal | Enhanced | 44 | 43.94 | 1933.50 | -0.725 | 0.234 |
| | Standard | 47 | 47.93 | 2252.50 | | |
| External | Enhanced | 44 | 44.14 | 1942.00 | -0.313 | 0.377 |
| | Standard | 45 | 45.84 | 2063.00 | | |

## 5.3. Attitudes to Safety

Analysis of individual attitude items within the six subscales: skepticism, responsibility, boatmanship, vessel restrictions, regulations and risk acceptance are presented in Tables 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5 and 5.3.6 respectively. The enhanced group showed a significant difference in one individual skepticism item, two individual responsibility items and two individual regulation items; in contrast, the standard group showed a significant difference in one individual responsibility item and one individual boatmanship item only. Respondents in the standard group showed no significant difference in any of the attitude subscales whilst respondents in the enhanced group showed a significant difference in attitudes toward responsibility and regulations (Table 5.3.7). There was no significant difference in overall attitudes scores between the two groups (Table 5.3.8).

**5.3.1 Skepticism Items:** Table 5.3.1 identifies the proportion of participants in each group before and after the intervention who strongly agreed, agreed, didn't know, disagreed or strongly disagreed with a series of statements skeptical of safety issues. There was a larger proportion of participants from both groups who disagreed, after the intervention, with the statement: All the safety equipment you are required to carry clutters up the boat. Although this change was not significant for the standard group it was significant for the enhanced group. More than two thirds of the participants from both groups disagreed or strongly disagreed with the following statements both before and after the intervention:

- If you are worried about safety you wouldn't get your job done.
- The government spends too much time and resources on safety at sea.
- The reason I carry the required safety equipment is so that I won't receive a fine.
- All too often, strict adherence to the safety rules and regulations causes more trouble than it's worth.

**Table 5.3.1 Pre- and Post-Training Score Differences in Skepticism Items**

| SKEPTICISM | Before | | | | | After | | | | | Wilcoxon test two-tailed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Strongly Agree (N) | % Agree (N) | % Don't Know (N) | % Disagree (N) | % Strongly Disagree (N) | % Strongly Agree (N) | % Agree (N) | % Don't Know (N) | % Disagree (N) | % Strongly Disagree (N) | Z | *p* |
| Skept. 1 | | | | | | | | | | | | |
| Standard | 6.3 (3) | 12.5 (6) | 8.3 (4) | 56.3 (27) | 16.7 (8) | 6.3 (3) | 16.7 (8) | 2.1 (1) | 41.7 (20) | 33.3 (16) | -0.747a | 0.455 |
| Enhanced | 4.3 (2) | 15.2 (7) | 13 (6) | 47.8 (22) | 17.4 (8) | 2.2 (1) | 8.7 (4) | 6.5 (3) | 54.3 (25) | 26.1 (12) | -2.119a | 0.034 |
| Skept. 2 | | | | | | | | | | | | |
| Standard | 14.6 (7) | 33.3 (16) | 4.2 (2) | 31.3 (15) | 12.5 (6) | 6.3 (3) | 39.6 (19) | 6.3 (3) | 31.3 (15) | 14.6 (7) | -0.723a | 0.470 |
| Enhanced | 8.7 (4) | 30.4 (14) | 10.9 (5) | 34.8 (16) | 15.2 (7) | 10.9(5) | 26.1 (12) | 15.2 (7) | 30.4 (14) | 17.4 (8) | -0.036b | 0.971 |
| Skept. 3 | | | | | | | | | | | | |
| Standard | 10.4 (5) | 16.7 (8) | 6.3 (3) | 52.1 (25) | 12.5 (6) | 4.2 (2) | 20.8 (10) | 10.4 (5) | 41.7 (20) | 18.8 (9) | -0.379a | 0.704 |
| Enhanced | 2.2 (1) | 13 (6) | 21.7 (10) | 52.2 (24) | 10.9 (5) | 2.2 (1) | 13 (6) | 13 (6) | 47.8 (22) | 21.7 (10) | -1.196a | 0.232 |
| Skept. 4 | | | | | | | | | | | | |
| Standard | 8.3 (4) | 10.4 (5) | 10.4 (5) | 47.9 (23) | 20.8 (10) | 2.1 (1) | 29.2 (14) | 4.2 (2) | 41.7 (20) | 18.8 (9) | -0.534b | 0.593 |
| Enhanced | 0 | 21.7 (10) | 19.6 (9) | 45.7 (21) | 8.7 (4) | 0 | 21.7 (10) | 15.2 (7) | 45.7 (21) | 17.4 (8) | -0.863a | 0.388 |
| Skept. 5 | | | | | | | | | | | | |
| Standard | 6.3 (3) | 16.7 (8) | 6.3 (3) | 52.1 (25) | 14.6 (7) | 2.1 (1) | 22.9 (11) | 2.1 (1) | 45.8 (22) | 27.1 (13) | -1.258a | 0.208 |
| Enhanced | 0 | 10.9 (5) | 6.5 (3) | 67.4 (31) | 13 (6) | 0 | 10.9 (5) | 2.2 (1) | 63 (29) | 23.9 (11) | -0.941a | 0.347 |
| Skept. 6 | | | | | | | | | | | | |
| Standard | 4.2 (2) | 2.1 (1) | 6.3 (3) | 54.2 (26) | 31.3 (15) | 0 | 2.1 (1) | 8.3 (4) | 45.8 (22) | 43.8 (21) | -1.428a | 0.153 |
| Enhanced | 0 | 2.2 (1) | 6.5 (3) | 60.9 (28) | 28.3 (13) | 4.3 (2) | 2.2 (1) | 4.3 (2) | 58.7 (27) | 30.4 (14) | -0.028b | 0.978 |
| Skept. 7 | | | | | | | | | | | | |
| Standard | 4.2 (2) | 6.3 (3) | 4.2 (2) | 54.2 (26) | 29.2 (14) | 8.3 (4) | 12.5 (6) | 0 | 45.8 (22) | 31.3 (15) | -1.114b | 0.265 |
| Enhanced | 0 | 6.5 (3) | 4.3 (2) | 63 (29) | 26.1 (12) | 2.2 (1) | 6.5 (3) | 4.3 (2) | 63 (29) | 23.9 (11) | -0.426b | 0.670 |
| Skept. 8 | | | | | | | | | | | | |
| Standard | 8.3 (4) | 8.3 (4) | 8.3 (4) | 56.3 (27) | 16.7 (8) | 4.2 (2) | 12.5 (6) | 2.1 (1) | 41.7 (20) | 37.5 (18) | -1.266a | 0.206 |
| Enhanced | 4.3 (2) | 13 (6) | 10.9 (5) | 52.2 (24) | 19.6 (9) | 0 | 15.2 (7) | 6.5 (3) | 54.3 (25) | 23.9 (11) | -0.962a | 0.336 |

Skept. 1. All the safety equipment you are required to carry clutters up the boat.
Skept. 2. The required safety equipment is too expensive.
Skept. 3. Many of the present safety regulations are unrealistic and should be changed.
Skept. 4. Recommended safety procedures work until you become busy.
Skept. 5. If you are worried about safety you wouldn't get your job done.
Skept. 6. The government spends too much time and resources on safety at sea.
Skept. 7. The reason I carry the required safety equipment is so that I won't receive a fine.
Skept. 8. All too often, strict adherence to the safety rules and regulations causes more trouble than it's worth.

a The sum of negative ranks equal the sum of positive ranks
b Based on positive ranks

**5.3.2 Responsibility Items:** Table 5.3.2 identifies the proportion of participants in each group before and after the intervention who rated a series of statements on safety responsibility with either: strongly agree, agree, don't know, disagree or strongly disagree. There was a larger proportion of participants in both groups who strongly agreed with the following statements after the intervention: Personal flotation devices should be worn when working on deck; all boats should have safety inspections every year; and, a fisherman/seafarer is less likely to have an accident if s/he takes safety courses. Change in the first statement was significant for the standard group while changes in the latter two statements were significant for the enhanced group. More than two thirds of the pre- and post-training participants from both groups agreed/strongly agreed with the statement: the union should be more concerned with safety issues. More than three quarters of pre- and post-training participants disagreed/strongly disagreed with the statement: The RCMP/Coast Guard have no business boarding fishing or other vessels.

**Table 5.3.2 Pre- and Post-Training Score Differences in Responsibility Items**

| RESPONSIBILITY | Before | | | | | After | | | | | Wilcoxon test two-tailed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Strongly Agree (N) | % Agree (N) | % Don't Know (N) | % Disagree (N) | % Strongly Disagree (N) | % Strongly Agree (N) | % Agree (N) | % Don't Know (N) | % Disagree (N) | % Strongly Disagree (N) | Z | p |
| Respon. 1 | | | | | | | | | | | | |
| Standard | 33.3 (16) | 25 (12) | 14.6 (7) | 22.9 (11) | 4.2 (2) | 47.9 (23) | 33.3 (16) | 4.2 (2) | 10.4 (5) | 4.2 (2) | -2.981a | 0.003 |
| Enhanced | 26.1 (12) | 34.8 (16) | 13 (6) | 26.1 (12) | 0 | 30.4 (14) | 41.3 (19) | 8.7 (4) | 17.4 (8) | 2.2 (1) | -1.437a | 0.151 |
| Respon. 2 | | | | | | | | | | | | |
| Standard | 52.1 (25) | 33.3 (16) | 2.1 (1) | 12.5 (6) | 0 | 43.8 (21) | 50 (24) | 0 | 6.3 (3) | 0 | -0.677a | 0.499 |
| Enhanced | 30.4 (14) | 43.5 (20) | 0 | 21.7 (10) | 4.3 (2) | 39.1 (18) | 45.7 (21) | 4.3 (2) | 10.9 (5) | 0 | -2.808a | 0.005 |
| Respon. 3 | | | | | | | | | | | | |
| Standard | 22.9 (11) | 39.6 (19) | 6.3 (3) | 25 (12) | 6.3 (3) | 29.2 (14) | 35.4 (17) | 2.1 (1) | 25 (12) | 8.3 (4) | -0.203a | 0.839 |
| Enhanced | 13 (6) | 47.8 (22) | 8.7 (4) | 23.9 (11) | 6.5 (3) | 37 (17) | 47.8 (22) | 0 | 13 (6) | 2.2 (1) | -2.767a | 0.006 |
| Respon. 4 | | | | | | | | | | | | |
| Standard | 20.8 (10) | 50 (24) | 10.4 (5) | 10.4 (5) | 6.3 (3) | 20.8 (10) | 60.4 (29) | 8.3 (4) | 2.1 (1) | 8.3 (4) | -1.048a | 0.295 |
| Enhanced | 13 (6) | 54.3 (25) | 23.9 (11) | 6.5 (3) | 0 | 19.6 (9) | 58.7 (27) | 13 (6) | 6.5 (3) | 0 | -1.209a | 0.227 |
| Respon. 5 | | | | | | | | | | | | |
| Standard | 2.1 (1) | 12.5 (6) | 4.2 (2) | 47.9 (23) | 31.3 (15) | 4.2 (2) | 10.4 (5) | 4.2 (2) | 52.1 (25) | 29.2 (14) | -0.269b | 0.788 |
| Enhanced | 0 | 6.5 (3) | 4.3 (2) | 65.2 (30) | 23.9 (11) | 2.2 (1) | 2.2 (1) | 6.5 (3) | 67.4 (31) | 21.7 (10) | -0.378b | 0.705 |

Respon. 1. Personal flotation devices should be worn when working on deck.
Respon. 2. All boats should have safety inspections every year.
Respon. 3. A fisherman/seafarer is less likely to have an accident if s/he takes safety courses.
Respon. 4. The union should be more concerned with safety issues.
Respon. 5. The RCMP/Coast Guard have no business boarding fishing or other vessel.
a The sum of negative ranks equal the sum of positive ranks
b Based on positive ranks

**5.3.3 Boatmanship Items:** Table 5.3.3 identifies the proportion of participants in each group before and after the intervention who rated a series of statements on boatmanship with either: strongly agree, agree, don't know, disagree or strongly disagree. Although not statistically significant, more than 89% of all pre- and post-training participants in both groups agreed/strongly agreed with the statements: Boat decks should be washed down after each working day/end of shift; and, when not in use, all fishing or deck gear should be stored readily on the deck.

**Table 5.3.3 Pre- and Post-Training Score Differences in Boatmanship Items**

| BOATMANSHIP | Before | | | | | After | | | | | Wilcoxon test two-tailed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Strongly Agree (N) | % Agree (N) | % Don't Know (N) | % Disagree (N) | % Strongly Disagree (N) | % Strongly Agree (N) | % Agree (N) | % Don't Know (N) | % Disagree (N) | % Strongly Disagree (N) | Z | *p* |
| Boat. 1 | | | | | | | | | | | | |
| Standard | 52.1 (25) | 45.8 (22) | 2.1 (1) | 0 | 0 | 64.6 (31) | 35.4 (17) | 0 | 0 | 0 | -1.941a | 0.052 |
| Enhanced | 52.2 (24) | 37 (17) | 8.7 (4) | 0 | 2.2 (1) | 58.7 (27) | 37 (17) | 2.2 (1) | 2.2 (1) | 0 | -1.213a | 0.225 |
| Boat. 2 | | | | | | | | | | | | |
| Standard | 43.8 (21) | 47.9 (23) | 2.1 (1) | 6.3 (3) | 0 | 56.3 (27) | 35.4 (17) | 4.2 (2) | 4.2 (2) | 2.1 (1) | -0.809a | 0.419 |
| Enhanced | 41.3 (19) | 47.8 (22) | 6.5 (3) | 4.3 (2) | 0 | 43.5 (20) | 50 (23) | 0 | 6.5 (3) | 0 | -0.426a | 0.644 |

Boat. 1. Boat decks should be washed down after each working day/end of shift.

Boat. 2. When not in use all fishing or deck gear should be stored readily on the deck.

a The sum of negative ranks equal the sum of positive ranks

**5.3.4 Vessel Restriction Items:** Table 5.3.4 identifies the proportion of participants in each group before and after the intervention who rated a series of statements on vessel restrictions with which they either: strongly agree, agree, don't know, disagree or strongly disagree. More than three-quarters of the pre- and post-training participants in both groups rated the following statements with agree/strongly agree: fishing vessels should be limited as to how much fishing gear they carry; and, fishing vessels should be limited as to how much fish they carry in one trip. About 65% of the post-training participants from both groups agreed/strongly disagreed with the statement: fishing vessels should be limited as to how far they can travel from shore.

**Table 5.3.4 Pre- and Post-Training Score Differences in Vessel Restriction Items**

| VESSEL RESTRICTION | Before | | | | | After | | | | | Wilcoxon test two-tailed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Strongly Agree (N) | % Agree (N) | % Don't Know (N) | % Disagree (N) | % Strongly Disagree (N) | % Strongly Agree (N) | % Agree (N) | % Don't Know (N) | % Disagree (N) | % S. Disagree (N) | Z | *P* |
| Ves.Res.1 | | | | | | | | | | | | |
| Standard | 20.8 (10) | 29.2 (14) | 8.3 (4) | 31.3 (15) | 8.3 (4) | 16.7 (8) | 47.9 (23) | 6.3 (3) | 22.9 (11) | 6.3 (3) | -1.666a | 0.096 |
| Enhanced | 13 (6) | 47.8 (22) | 15.2 (7) | 17.4 (8) | 6.5 (3) | 10.9 (5) | 54.3 (25) | 10.9 (5) | 17.4 (8) | 6.5 (3) | -0.193a | 0.847 |
| Ves.Res.2 | | | | | | | | | | | | |
| Standard | 25 (12) | 50 (24) | 8.3 (4) | 14.6 (7) | 0 | 27.1 (13) | 60.4 (29) | 4.2 (2) | 4.2 (2) | 2.1 (1) | -1.441a | 0.150 |
| Enhanced | 13 (6) | 67.4 (31) | 4.3 (2) | 10.9 (5) | 2.2 (1) | 26.1 (12) | 52.2 (24) | 4.3 (2) | 13 (6) | 2.2 (1) | -0.554a | 0.580 |
| Ves.Res.3 | | | | | | | | | | | | |
| Standard | 25 (12) | 50 (24) | 2.1 (1) | 20.8 (10) | 0 | 29.2 (14) | 54.2 (26) | 4.2 (2) | 6.3 (3) | 4.2 (2) | -1.459a | 0.145 |
| Enhanced | 10.9 (5) | 69.6 (32) | 4.3 (2) | 8.7 (4) | 4.3 (2) | 23.9 (11) | 54.3 (25) | 2.2 (1) | 15.2 (7) | 2.2 (1) | -0.606a | 0.545 |

Ves.Res. 1. Fishing vessels should be limited as to how far they can travel from shore.
Ves.Res. 2. Fishing vessels should be limited as to how much fishing gear they carry.
Ves.Res. 3. Fishing vessels should be limited as to how much fish they carry in one trip.
a The sum of negative ranks equal the sum of positive ranks

**5.3.5 Regulations Items:** Table 5.3.5 identifies the proportion of participants in each group before and after the intervention who rated a series of statements on regulations with which they either: strongly agreed, agreed, didn't know, disagreed or strongly disagreed. A large proportion of pre- and post-training participants from both groups agreed/strongly agreed with the following statements: fisherman/Seafarer should never put to sea in bad weather; and, if you follow safety regulations you are less likely to have an accident. The change in pre- and post-training rating was significant for the enhanced group for both statements, but not for the standard group.

**Table 5.3.5 Pre- and Post-Training Score Differences in Regulation Items**

| REGULATIONS | Before | | | | | After | | | | | Wilcoxon test two tailed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Strongly Agree (N) | % Agree (N) | % Don't Know (N) | % Disagree (N) | % S. Disagree (N) | % Strongly Agree (N) | % Agree (N) | % Don't Know (N) | % Disagree (N) | % S. Disagree (N) | Z | P |
| Regul. 1 | | | | | | | | | | | | |
| Standard | 45.8 (22) | 33.3 (16) | 4.2 (2) | 12.5 (6) | 2.1 (1) | 39.6 (19) | 43.8 (21) | 6.3 (3) | 8.3 (4) | 2.1 (1) | 0.039a | 0.969 |
| Enhanced | 19.6 (9) | 45.7 (21) | 8.7 (4) | 23.9 (11) | 2.2 (1) | 34.8 (16) | 47.8 (22) | 4.3 (2) | 13 (6) | 0 | -3.300a | 0.001 |
| Regul. 2 | | | | | | | | | | | | |
| Standard | 35.4 (17) | 52.1 (25) | 0 | 8.3 (4) | 2.1 (1) | 33.3 (16) | 50 (24) | 2.1 (1) | 6.3 (3) | 4.2 (2) | -0.357b | 0.721 |
| Enhanced | 21.7 (10) | 60.9 (28) | 8.7 (4) | 6.5 (3) | 2.2 (1) | 47.8 (22) | 43.5 (20) | 2.2 (1) | 4.3 (2) | 2.2 (1) | -1.968a | 0.049 |

Regul. 1. Fisherman/seafarer should never put to sea in bad weather.
Regul. 2. If you follow safety regulations you are less likely to have an accident.
a The sum of negative ranks equal the sum of positive ranks
b Based on positive ranks

**5.3.6 Risk Acceptance Items:** Table 5.3.6 identifies the proportion of participants in each group before and after the intervention who rated a series of statements on risk acceptance with which they either: strongly agreed, agreed, didn't know, disagreed or strongly disagreed. About 23% of participants in the standard group and 39% of participants in the enhanced group agreed/strongly agreed that they had gone out to sea in bad weather in spite of advice from others. Twenty-seven percent of the participants in the standard group and 35% of the participants in the enhanced group described themselves after the intervention as the risk-taking type. More than three-quarters of the participants from both groups disagreed/strongly disagreed with the statement: fishing would not be as enjoyable without the risks that are involved.

**Table 5.3.6 Pre- and Post-Training Score Differences in Risk Acceptance Items**

| RISK ACCEPTANCE | Before | | | | | After | | | | | Wilcoxon test two-tailed | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % Strongly Agree (N) | % Agree (N) | % Don't Know (N) | % Disagree (N) | % Strongly Disagree (N) | % Strongly Agree (N) | % Agree (N) | % Don't Know (N) | % Disagree (N) | % Strongly Disagree (N) | Z | p |
| Risk.Ac.1 | | | | | | | | | | | | |
| Standard | 10.4 (5) | 12.5 (6) | 10.4 (5) | 52.1 (25) | 12.5 (6) | 0 | 22.9 (11) | 14.6 (7) | 41.7 (20) | 16.7 (8) | -0.265a | 0.791 |
| Enhanced | 0 | 28.3 (13) | 13 (6) | 43.5 (20) | 13 (6) | 0 | 39.1 (18) | 8.7 (4) | 32.6 (15) | 19.6 (9) | -0.572b | 0.567 |
| Risk.Ac.2 | | | | | | | | | | | | |
| Standard | 2.1 (1) | 18.8 (9) | 6.3 (3) | 56.3 (27) | 14.6 (7) | 0 | 27.1 (13) | 2.1 (1) | 43.8 (21) | 25 (12) | -0.014a | 0.989 |
| Enhanced | 2.2 (1) | 30.4 (14) | 2.2 (1) | 50 (23) | 15.2 (7) | 2.2 (1) | 32.6 (15) | 2.2 (1) | 39.1 (18) | 21.7 (10) | -0.036a | 0.971 |
| Risk.Ac.3 | | | | | | | | | | | | |
| Standard | 2.1 (1) | 4.2 (2) | 6.3 (3) | 47.9 (23) | 35.4 (17) | 2.1 (1) | 18.8 (9) | 4.2 (2) | 31.3 (15) | 41.7 (20) | -1.637b | 0.102 |
| Enhanced | 2.2 (1) | 10.9 (5) | 6.5 (3) | 54.3 (25) | 26.1 (12) | 0 | 6.5 (3) | 10.9 (5) | 47.8 (22) | 34.8 (16) | -1.755a | 0.079 |

Risk.Ac.1. I have gone to sea in bad weather in spite of advice from others.
Risk.Ac.2. I am the type of person who takes risks.
Risk.Ac.3. Fishing would not be as enjoyable without the risks that are involved.
a The sum of negative ranks equal the sum of positive ranks
b Based on positive ranks

### 5.3.7 Six Attitude Factors

The enhanced group showed a significant change in attitudes toward responsibility ($p<0.05$) and regulation ($p<0.05$), and in the overall attitudes score (Table 5.3.7); in contrast the standard group showed a significant change only in the overall attitudes score.

**Table 5.3.7 Six Attitude Factors**

| Total After minus Before Scores | Wilcoxon test two-tailed | | | |
|---|---|---|---|---|
| | Standard | | Enhanced | |
| | Z | *p* | Z | *p* |
| Skepticism | -1.174a | 0.240 | -1.176a | 0.240 |
| Responsibility | -1.569a | 0.117 | -3.318a | 0.001 |
| Boatmanship | -1.726a | 0.084 | -.962a | 0.336 |
| Vessel Restrictions | -1.674a | 0.094 | -.208a | 0.835 |
| Regulations | -.469b | 0.639 | -2.991a | 0.003 |
| Risk Acceptance | -.015a | 0.988 | -.797a | 0.425 |
| Total Attitudes scores | -2.217a | 0.027 | -3.089a | 0.002 |

a Based on negative ranks.
b Based on positive ranks.

### 5.3.8 Attitudes Scores Between Groups

Comparison of the overall post-training attitudes score between the enhanced and standard groups shows no significant difference in any of the subscales or overall attitudes scores ($p>0.05$; Table 5.3.8).

**Table 5.3.8 Attitudes Scores Between Groups**

| Post-Training Attitudes Scores | | N | Mean Rank | Sum of Ranks | Z | Mann Whitney U Two-tailed *p* |
|---|---|---|---|---|---|---|
| Skepticism | Enhanced | 46 | 46.35 | 2132.00 | | |
| | Standard | 45 | 45.64 | 2054.00 | -0.127 | 0.449 |
| Regulations | Enhanced | 46 | 48.37 | 2225.00 | | |
| | Standard | 46 | 44.63 | 2053.00 | -0.690 | 0.245 |
| Responsibility | Enhanced | 46 | 48.04 | 2210.00 | | |
| | Standard | 48 | 46.98 | 2255.00 | -0.190 | 0.425 |
| Boatmanship | Enhanced | 46 | 43.71 | 2010.50 | | |
| | Standard | 47 | 50.22 | 2360.50 | -1.243 | 0.107 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Vessel Restriction | Enhanced | 46 | 46.79 | 2152.50 | | |
| | Standard | 47 | 47.20 | 2218.50 | -0.076 | 0.470 |
| Risk Acceptance | Enhanced | 46 | 45.71 | 2102.50 | | |
| | Standard | 46 | 47.29 | 2175.50 | -0.287 | 0.387 |
| Total scores After | Enhanced | 39 | 37.68 | 1469.50 | | |
| | Standard | 42 | 44.08 | 1851.50 | -1.225 | 0.221 |

### 5.4 Safety knowledge

**5.4.1. Individual Knowledge Items:** There were 19 individual knowledge items in the questionnaire. Both the standard and enhanced group showed a significant increase in knowledge score for 12 knowledge items. Ten of these were common to both groups including: common causes of shipboard accidents, life jacket storage, device to launch lifeboats, how to launch a life raft, life raft pressure relief valve, inflation of life raft floor, survival plan, fire tetrahedron, Class B fire, and responsibility for safety onboard. In addition to these items, the enhanced group showed a significant increase in knowledge score with regard to two items: purpose of Muster list and rescue sling. The standard group showed a significant increase in knowledge score with regard to two other knowledge items: body losses in a survival situation and first priority after abandoning vessel. The remaining five items that did not show any significant increase in post-training scores included: effective means of preventing accidents, survival craft, signalling devices, cabin on fire and donning a life jacket. More than 78% of the participants were already responding correctly to these knowledge questions prior to their training.

**Table 5.4.1. Individual Knowledge Items**

| Individual Knowledge Items | | % Correct (N) | | McNemar test 1-tailed |
|---|---|---|---|---|
| | | Before | After | *P* |
| **Common cause of shipboard accidents** | | | | |
| | Standard | 75 (36) | 97.9 (47) | 0.001 |
| | Enhanced | 69.6 (32) | 100 (46) | 0.000 |
| **Effective means of preventing accidents** | | | | |
| | Standard | 81.3 (39) | 83.3 (40) | 0.500 |
| | Enhanced | 78.3 (36) | 91.3 (42) | 0.063 |
| **Purpose of Muster List** | | | | |
| | Standard | 87.5 (42) | 89.6 (43) | 0.500 |
| | Enhanced | 71.1 (33) | 97.8 (45) | 0.011 |
| **Donning a lifejacket** | | | | |
| | Standard | 95.8 (46) | 85.4 (41) | 0.110 |
| | Enhanced | 91.3 (42) | 84.8 (39) | 0.227 |
| **Lifejacket storage** | | | | |
| | Standard | 72.9 (35) | 93.8 (45) | 0.001 |
| | Enhanced | 67.4 (31) | 82.6 (38) | 0.046 |
| **Survival Craft** | | | | |
| | Standard | 95.8 (46) | 93.8 (45) | 0.500 |
| | Enhanced | 95.7 (44) | 100 (46) | 0.500 |
| **Device to launch lifeboats** | | | | |
| | Standard | 50 (24) | 85.4 (41) | 0.002 |
| | Enhanced | 30.4 (14) | 93.5 (43) | 0.000 |
| **Launching a life raft** | | | | |
| | Standard | 43.8 (21) | 89.6 (43) | 0.000 |
| | Enhanced | 58.7 (27) | 89.1 (41) | 0.011 |
| **Life raft pressure relief valve** | | | | |
| | Standard | 37.5 (18) | 60.4 (29) | 0.011 |
| | Enhanced | 52.2 (24) | 80.4 (37) | 0.011 |
| **Floor of a life raft inflated** | | | | |
| | Standard | 64.6 (31) | 95.8 (46) | 0.000 |
| | Enhanced | 52.2 (24) | 95.7 (44) | 0.000 |
| **Body losses in survival situation** | | | | |
| | Standard | 85.4 (41) | 95.8 (46) | 0.032 |
| | Enhanced | 87 (40) | 95.7 (44) | 0.227 |
| **Survival plan** | | | | |
| | Standard | 16.7 (8) | 35.4 (17) | 0.018 |
| | Enhanced | 15.2 (7) | 58.7 (27) | 0.000 |
| **Signalling devices** | | | | |
| | Standard | 91.7 (44) | 93.8 (45) | 0.500 |
| | Enhanced | 89.1 (41) | 93.5 (43) | 0.500 |
| **Rescue sling** | | | | |
| | Standard | 83.3 (40) | 95.8 (46) | 0.110 |
| | Enhanced | 69.6 (32) | 95.7 (44) | 0.000 |
| **Cabin on fire** | | | | |

| Individual Knowledge Items | | % Correct (N) | | McNemar test 1-tailed |
|---|---|---|---|---|
| | | Before | After | *P* |
| | Standard | 100 (48) | 97.9 (47) | 0.500 |
| | Enhanced | 97.8 (45) | 97.8 (45) | 0.500 |
| **Fire tetrahedron** | | | | |
| | Standard | 31.3 (15) | 89.6 (43) | 0.000 |
| | Enhanced | 32.6 (15) | 95.7 (44) | 0.000 |
| **Class B fire** | | | | |
| | Standard | 37.5 (18) | 83.3 (40) | 0.000 |
| | Enhanced | 34.8 (16) | 95.7 (44) | 0.000 |
| **Responsible for safety onboard** | | | | |
| | Standard | 75 (36) | 93.8 (45) | 0.011 |
| | Enhanced | 73.9 (34) | 95.7 (44) | 0.011 |
| **Priority after abandoning vessel** | | | | |
| | Standard | 47.9 (23) | 79.2 (38) | 0.000 |
| | Enhanced | 67.4 (31) | 82.6 (38) | 0.055 |
| **Emergency drills on board** | | | | |
| | Standard | 93.8 (45) | 93.8 (45) | 0.500 |
| | Enhanced | 95.7 (44) | 97.8 (45) | 0.500 |

**5.4.2. Total Knowledge Score:** The mean difference in training score (post-pre) was significant for both the standard (3.67; $p<0.001$) and enhanced (4.98; $p<0.001$) groups (Table 5.4.2). With a difference in mean score of 1.31, the enhanced group scored significantly ($p<0.05$) higher than the controls on knowledge scores (Fig. 3).

**Table 5.4.2. Total Knowledge Score**

| Total Knowledge Score | Mean Difference | t | d.f | Sig. 1-tailed *p* |
|---|---|---|---|---|
| Standard (After-Before) | 3.67 | 10.547 | 47 | 0.000 |
| Enhanced (After-Before) | 4.98 | 11.574 | 45 | 0.000 |
| Combined (After-Before) | 4.31 | 15.269 | 93 | 0.000 |
| Group difference (Enhanced-Control) | 1.31 | 2.381 | 92 | 0.010 |

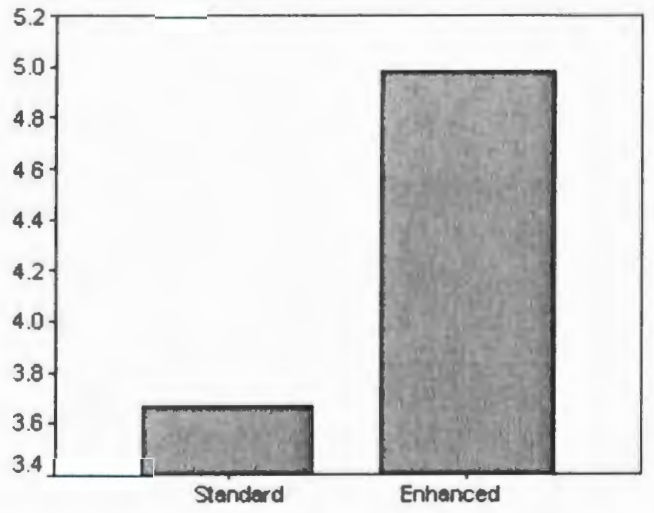


*Figure 3:* Mean differences between total knowledge scores

### 5.5. General Information

#### 5.5.1. Factors Affecting Participants' Decision to Attend MEDA1

Almost all (98%) participants felt that their personal desire to improve safety knowledge was an important factor influencing their decision to take the MEDA1 course (of which 63% said it was very important). Fifteen percent of the participants felt that their family's or friends' recommendation was a very important influencing factor in their decision to attend MEDA1, while 49% felt that it was also a very important regulatory requirement to complete this course. Close to half of the participants felt that lack of time (50%), fear, level of literacy, or the cost of training (46% each) were not important factors in their decision to attend the class. Location and the duration of training were important or very important factors for 41.5% and 52.1% respectively. There was no significant difference in opinion between the standard and enhanced group on these questions with the exception of job requirement. Roughly three-quarters of participants in the enhanced group (74%) felt that job requirement was an important contributory factor compared to about half (54%) of participants in the standard group ($p<0.05$).

**Table 5.5.1. Factors Affecting Participants' Decision to Attend MEDA1**

| How important were the following factors in your decision to attend this class? | % Not Important (N) | % Slightly Important (N) | % Important (N) | % Very Important (N) | Mann-Whitney U Sig. 2-tailed Z | p |
|---|---|---|---|---|---|---|
| **Family or friend recommendation** | | | | | | |
| Enhanced | 26.1 (12) | 28.3 (13) | 26.1 (12) | 17.4 (8) | | |
| Standard | 31.3 (15) | 20.8 (10) | 33.3 (16) | 12.5 (6) | | |
| Total | 28.7 (27) | 24.5 (23) | 29.8 (28) | 14.9 (14) | -0.328 | 0.743 |
| **Job Requirement** | | | | | | |
| Enhanced | 2.2 (1) | 0 | 23.9 (11) | 73.9 (34) | | |
| Standard | 0 | 6.3 (3) | 39.6 (19) | 54.2 (26) | | |
| Total | 1.1 (1) | 3.2 (3) | 31.9 (30) | 63.8 (60) | -2.010 | 0.044 |
| **Desire to improve safety knowledge** | | | | | | |
| Enhanced | 2.2 (1) | 2.2 (1) | 34.8 (16) | 60.9 (28) | | |
| Standard | 0 | 0 | 35.4 (17) | 64.6 (31) | | |
| Total | 1.1 (1) | 1.1 (1) | 35.1 (33) | 62.8 (59) | -0.521 | 0.603 |
| **Regulatory Requirement** | | | | | | |
| Enhanced | 2.2 (1) | 13.0 (6) | 32.6 (15) | 50.0 (23) | | |
| Standard | 6.3 (3) | 4.2 (2) | 37.5 (18) | 47.9 (23) | | |
| Total | 4.3 (4) | 8.5 (8) | 35.1 (33) | 48.9 (46) | -0.053 | 0.958 |
| **Cost of Training** | | | | | | |
| Enhanced | 43.5 (20) | 19.6 (9) | 21.7 (10) | 13.0 (6) | | |
| Standard | 47.9 (23) | 14.6 (7) | 12.5 (6) | 25.0 (12) | | |
| Total | 45.7 (43) | 17.0 (16) | 17.0 (16) | 19.1 (18) | -0.241 | 0.809 |
| **Lack of time** | | | | | | |
| Enhanced | 52.2 (24) | 23.9 (11) | 15.2 (7) | 6.5 (3) | | |
| Standard | 47.9 (23) | 16.7 (8) | 18.8 (9) | 16.7 (8) | | |
| Total | 50.0 (47) | 20.2 (19) | 17.0 (16) | 11.7 (11) | -1.051 | 0.293 |
| **Duration of training** | 39.1 (18) | 13.0 (6) | 30.4 (14) | 15.2 (7) | | |
| Enhanced | 35.4 (17) | 6.3 (3) | 37.5 (18) | 20.8 (10) | | |
| Standard | 37.2 (35) | 9.6 (9) | 34.0 (32) | 18.1 (17) | -0.884 | 0.377 |
| Total | | | | | | |
| **Location** | | | | | | |
| Enhanced | 43.5 (20) | 10.9 (5) | 30.4 (14) | 13.0 (6) | | |
| Standard | 41.7 (20) | 14.6 (7) | 29.2 (14) | 10.4 (5) | | |
| Total | 42.6 (40) | 12.8 (12) | 29.8 (28) | 11.7 (11) | -0.165 | 0.869 |
| **Personal Interest** | | | | | | |
| Enhanced | 6.5 (3) | 13.0 (6) | 47.8 (22) | 32.6 (15) | | |
| Standard | 8.3 (4) | 4.2 (2) | 47.9 (23) | 37.5 (18) | | |
| Total | 7.4 (7) | 8.5 (8) | 47.9 (45) | 35.1 (33) | -0.754 | 0.451 |
| **Fear** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Enhanced | 47.8 (22) | 13.0 (6) | 23.9 (11) | 15.2 (7) | | |
| Standard | 43.8 (21) | 16.7 (8) | 22.9 (11) | 14.6 (7) | | |
| Total | 45.7 (43) | 14.9 (14) | 23.4 (22) | 14.9 (14) | -0.131 | 0.869 |
| **Level of Literacy** | | | | | | |
| Enhanced | 47.8 (22) | 10.9 (5) | 21.7 (10) | 13.0 (6) | | |
| Standard | 43.8 (21) | 12.5 (6) | 25.0 (12) | 16.7 (8) | | |
| Total | 45.7 (43) | 11.7 (11) | 23.4 (22) | 14.9 (14) | -0.619 | 0.536 |

### 5.5.2 Safety Ideas and Willingness to Serve on Safety Committees

More than half (54%) of the pre-training participants in each group and, in total, claimed to have taken previous safety training courses. The majority, however, claimed that they did not have ideas about ways to improve safety in the fishery (65%) nor were they willing to serve on local safety committees (68%). There was no significant difference in response between the two groups ($p$>0.05; Table 5.5.2).

**Table 5.5.2: Safety Ideas and Willingness to Serve on Committees**

| | % Yes (N) | % No (N) | $\chi^2$ | d.f. | Sig. 2-tailed $p$ |
|---|---|---|---|---|---|
| **Have you previously attended any safety training courses?** | | | | | |
| Enhanced | 54.3 (25) | 45.7 (21) | | | |
| Standard | 54.2 (26) | 45.8 (22) | 0.000 | 1 | 0.986 |
| **Are you willing to serve on a local safety committee?** | | | | | |
| Enhanced | 32.6 (15) | 65.2 (30) | | | |
| Standard | 29.2 (14) | 70.8 (34) | 0.188 | 1 | 0.665 |
| **Do you have ideas that could improve safety in the fishery?** | | | | | |
| Enhanced | 39.1 (18) | 56.5 (26) | | | |
| Standard | 27.1 (13) | 72.9 (35) | 1.964 | 1 | 0.161 |

### 5.5.3 Safety Training

A McNemar test analysis confirms that there was a significant increase in the proportion of participants (from 76% to 96%) saying that they had sufficient safety knowledge after the training (one-tailed $p < 0.001$). There was no significant difference between the enhanced (44 participants) and standard 46 participants) groups on this item (Mann-

Whitney one-tailed $p = 0.156$). When asked if they felt that their colleagues had sufficient knowledge to work safely aboard a vessel, the number of people saying yes increased significantly from 74 to 83 (one-tailed $p = 0.006$). No differences were found between the groups (Mann Whitney U, one-tailed $p = 0.133$) on this item. When asked if they knew of anyone else who could benefit from this course, the number of people saying yes increased significantly (one-tailed $p = 0.009$) from 57 (pre-training) to 69 (post-training). There was no significant differences (Mann Whitney U one-tailed $p = 0.378$) between the two groups on this item. The number of participants expressing interest in further safety training increased significantly (one-tailed $p = 0.007$) from 65 (pre-training) to 75 (post-training). There was no significant difference between the groups (Mann Whitney U one-tailed $p = 0.482$) this item. When asked if they think that fish harvesters/general seafarers should take safety lessons, there was no significant difference in opinion between the two groups or before and after training: the majority claimed that they should.

**Table 5.5.3: Safety Training**

| | % Yes (N) After | | Mann Whitney U 1-tailed *p* | % Yes (N) Groups Combined | | McNemar Test 1-tailed *p* |
|---|---|---|---|---|---|---|
| | Enhanced | Standard | | Before | After | |
| Do you feel you have sufficient knowledge to work safely aboard a vessel? | 95.7 (44) | 95.8 (46) | 0.156 | 75.5 (71) | 95.7 (90) | 0.000 |
| Do you feel that your colleagues have sufficient knowledge to work safely aboard a vessel? | 91.3 (42) | 85.4 (41) | 0.133 | 79 (74) | 88.3 (83) | 0.006 |
| Do you know of anyone else who could benefit from this course? | 73.9 (34) | 75 (36) | 0.378 | 53.6 (57) | 64.8 (69) | 0.009 |
| Are you interested in further safety training? | 80.4 (37) | 79.2 (38) | 0.482 | 61.1 (65) | 79.8 (75) | 0.007 |
| Do you think fish harvester/general seafarers should take a course in safety? | 97.8 (45) | 95.8 (46) | 0.5 | 78.9 (84) | 81.8 (87) | 0.125 |

### 5.5.4 Does Training Help in Real Situations?

When asked if they think that safety training helps in real situations, all participants both before and after training said it does.

**Table 5.5.4 Does Training Help in Real Situation?**

| Do you think safety training helps in real situations? | | % Yes (N) | % No (N) |
|---|---|---|---|
| | Enhanced | | |
| Before | | 95.7 (44) | 0 |
| **After** | | 97.8 (45) | 0 |
| | Standard | | |
| Before | | 100 (48) | 0 |
| **After** | | 95.2 (46) | 0 |
| | Total | | |
| **Before** | | 97.9 (92) | 0 |
| **After** | | 96.8 (91) | 0 |

### 5.5.5. Feedback on Video Clips

This was an open-ended question. The result is tabulated according to favourable and unfavourable reactions. While most (about 50%) had positive reactions to the clips, there were some who believed the clips could have been improved.

**Table 5.5.5. Feedback on Video Clips**

| | What did you think of the video clips? | %(N) |
|---|---|---|
| Favourable reactions | Educational | 2.2 (1) |
| | Excellent | 2.2 (1) |
| | Good | 36.9 (17) |
| | Informational | 2.2 (1) |
| | Very good | 8.7 (4) |
| | Very educational | 2.2 (1) |
| | Very knowledgeable | 2.2. (1) |
| Unfavourable reactions | Weak. There are more relevant and detailed clips available | 2.2 (1) |
| | Footage a little old | 2.2 (1) |
| | It helps to a degree but harder to remember than practical | 2.2 (1) |
| | Need to update to increase credibility | 2.2 (1) |
| | Not enough clips were shown | 4.3 (2) |
| | Nothing | 2.2 (1) |
| | Ok | 2.2 (1) |

## CHAPTER 6: Discussion and Conclusions

### General Discussion

Globalisation, changing markets and proliferation of technology has meant that the structure of employment in Canada is shifting toward a knowledge and technology intensive economy (Health Canada, 1999). Many Canadians are worried about being able to keep up with the changes of the global market and the fish harvesters of Newfoundland are no exception.

Commercial fishing is widely acknowledged to be a dangerous occupation (Abraham 2000; FAO 2000; ILO 1999; Meng 1991). Several factors contributing to accidents and hazards in the industry have been identified (Abraham, 2002; Antão et al., 2008; Binkley, 1995; NRC, 1991; TC, 2002). Safety training has been identified as one of the best solutions to the alarming rate of accidents and hazards in the industry (NRC, 1991). Education and safety training implemented in other fishing industries of the world show a wide acceptance by fish harvesters (Snorassson, 2000), an increase in knowledge and change in attitude toward the importance of workplace safety (Langaune, 2000), and overall reduction of fatalities and safer working practices (Dzugan, 2000; Lincoln & Conway, 1999; Perkins, 1995). Occupational health and safety training is a crucial component of accident prevention and injury reduction programs at the workplace (Cohen & Colligan, 1998). While safety training does not always have the desired impact (Darragh et al., 2004; Tan et al., 1991), it has been strongly suggested that training must be evaluated carefully to determine its effectiveness (Salas & Cannon-Bowers, 2001). This thesis followed Kirkpatrick's four-level model of training evaluation (1979, 1996) to assess the impact of training on fish harvesters' and other seafarers' knowledge and attitudes toward the MEDA training program.

The aim of this thesis was to examine the knowledge and attitudes of fish harvesters and other seafarers toward safety and the MEDA1 safety training program. Completion of the program showed a significant increase in knowledge on safety and changed attitudes toward safety practices and safety training among fish harvesters and other seafarers of Newfoundland and Labrador. Moreover, when the standard training program was augmented with video clips it seemed to further improve participants' knowledge and attitudes toward safety.

### 6.1 Knowledge of Safety and the Impact of Safety Training

Traditionally, fish harvesters gain knowledge of safety through practical experiences on the job (Murray & Dolomount, 1994; 1995). Participants of the MEDA1 training program reflected this knowledge and experience. They had an average of 16 years experience at sea and were generally quite knowledgeable of hazards and safety procedures. Two-thirds scored correctly on 12 out of the 19 individual knowledge items prior to the program. Still, there was a significant increase in the percentage of correct responses from both the standard and enhanced groups following the program. In both groups there was improvement on ten knowledge items concerning safety equipment (such as life jackets and life rafts), fires (understanding the different kinds of fires and how to put them out) and responsibility (such as survival plan and responsibility for safety on board etc.; Table 4.4.1).

The standard group showed a significant increase in two additional knowledge items: 'body losses in survival situation' and 'first priority after abandoning vessels'. It is noteworthy that more than 85% of the pre-training participants in the enhanced group were already scoring correctly on the former item and the latter, while not statistically

significant, showed an increase in the number of correct responses from 67% to 82% (Table 4.4.1). On the other hand, the enhanced group showed a significant increase in two other items: 'purpose of the muster list' and 'rescue sling'. Here, more than 80% of the pre-training standard group participants were already scoring correctly. The five remaining items ('effective means of preventing accidents', 'survival craft', 'signalling devices', 'cabin on fire' and 'donning a life jacket', Table 4.4.1) that did not show any significant change between pre- and post-training scores were correctly answered by more than 78% of both groups prior to the intervention. This would suggest that participants are generally knowledgeable of the dangers associated with marine work and related safety procedures.

It is interesting to note, however, that their knowledge revolved around what could be described as a 'theoretical' understanding. For instance, most (above 90%) from both groups knew that to don a life jacket one must have the correct size, secure the straps and stow the attachments (question 4 of the knowledge items on the questionnaire, Appendix A). While the steps were known to most, discussion revealed that participants had never practiced wearing them, nor did they know how to care for one, or indeed how it felt to wear one and jump into water. Post-training participants felt that their knowledge of life jackets increased from just knowing how it *might* work to actually knowing how it *does* work and the related safety procedures.

Similarly, all pre-training participants (almost 100%) knew that when the cabin is on fire, one must sound the alarm, report the location and start to fight the fire (question 15 of the knowledge items on the questionnaire, Appendix A). But they did not know the four required elements (namely heat, oxygen, chemical reaction, and fuel) that started a fire  question on fire tetrahedron increased in correct responses from 30% to almost

90% in each group; Table 4.4.1). They also did not know that removing any one of the four elements will extinguish a fire and that to remove it, one needs to have the appropriate extinguisher (question on class B fire increased from 35% to 85% in both groups; Table 4.4.1).

Pre-training participants' knowledge of safety (specially in relation to safety equipment) can be described as a theoretical understanding: they understood the importance of safety equipment, of the general hazards of fishing and of being out at sea and they thought they knew some of the common safety procedures such as putting on life jackets, putting out fires and so on. This gave them a sense of security and the perception of safety as 'common sense knowledge'. This sense of independence and subjective perception of safety has been documented in other studies (Murray & Dolomount, 1995; Poggie et al., 1995). Post-training participants, however, expressed an in-depth and increased knowledge of safety issues. They realized how little they actually knew of safety procedures and the extent to which they had relied on their limited knowledge. They reported an increased knowledge of safety equipment (how to operate, maintain and use), of emergency procedures (how to respond and react responsibly), and how to react to emergencies. Knowledge gained in classroom and in practical training was an empowering phenomenon for them. The proportion of participants who claimed that they and their colleagues had sufficient knowledge to work safely aboard a vessel increased significantly after the training (Table 4.5.3).

### 6.2 Attitudes Toward Safety and the Impact of Safety Training

Some pre-training participants expressed an indifferent attitude toward safety. They defined safety within a framework of risks and felt that the nature of fishing

dictates that harvesters be resilient, make judgement calls, be alert and basically use their 'common sense'. Similar attitudes to safety have been widely documented elsewhere (Binkley, 1991; Murray & Dolomount, 1995). Indeed, fatalistic attitudes to safety and accident, and anxiety have been identified as possible contributory factors toward accidents and it has been suggested that these characteristics lead to less attention being given to safety procedures and consequently to more accidents in the fishing industry (Antão et al., 2008; Murray, Fitzpatrick & O'Connell, 1997).

Post-training participants, however, expressed a different concept of safety. Instead of a fatalistic attitude, most reported that the training had increased their awareness of hazards, helped them realize how unaware they were, built their confidence and that they actually felt empowered to act in an emergency. Increased knowledge of safety equipment, emergency procedures and discovering their own physical abilities led to a redefinition of the concept of safety and a reduction in the fatalistic attitude. Participants, for instance, expressed a renewed respect for their safety equipment and there was a shift in attitudes from either being blindly dependent on safety equipment or not trusting it at all, to understanding how it actually works and therefore how it could be of help to them.

It is interesting to note, however, that a large proportion of pre-training participants from the standard group (48%) and the enhanced group (39%) agreed/strongly agreed that the required safety equipment was too expensive. Discussions also revealed that the expenses surrounding safety equipment and procedures frustrated the study participants. Although there was no change in their recognition of this cost, post-training participants admitted that they would purchase safety equipment (such as the survival suit) that was more expensive and not a

mandatory requirement because they felt it was better suited to their needs. This suggests that perhaps fish harvesters are not necessarily skeptical of safety measures (Murray & Dolomount, 1995). Instead, there is an appreciation of safety measures and a willingness to spend money on it as long as they could identify with its usefulness. Indeed a majority of the fish harvesters did not agree with the eight items that expressed skepticism towards some safety measures (Table 4.3.1).

Participants were generally aware of the risks and dangers associated with their occupation. This is consistent with other research in this area (Murray & Dolomount, 1994; Poggie et al., 1995). For example, more than 90% of the pre and post-training participants from both groups identified rough sea as either important or very important in accident causation. Yet, at least 20% of the participants described themselves as the risk-taking type and admitted to having gone out to sea in bad weather in spite of being advised otherwise. While this attitude is often described as the hallmark of a fishing subculture, it is noteworthy, that most (two thirds) disagreed/strongly disagreed to being the risk taking type (Table 4.3.6).

Previous research has suggested that restrictive government regulations that have been put in place for fishery management has encouraged some harvesters to take more risks (Kaplan & Kite-Powell, 2000) while others have suggested that the job selects the risk taking type (Binkley, 1991). However, it would appear that harvesters while adaptive to their hazardous environment are cognizant of the threats and that perhaps their attitudes toward safety are associated with a perception of risk management (Eklof & Torner, 2002). It has been argued elsewhere that whilst increasing risk awareness can stimulate safe behaviour, this does not work very well in the fishery where risky behaviour is often imperative for survival and economic gain. A study by Eklof &

Torner (2002) did not support previous research in the area of risk acceptance and low risk awareness among fish harvesters, but instead showed safety activity to be significantly associated with perceptions of risk management (and not with perceived level of risk, experience of accident or acceptance of risk).

A large proportion (80%) of pre-training participants agreed/strongly agreed that following safety regulations reduces the chance of accidents. Approximately 75% also agreed on limiting fishing vessels on the carriage of fish/fishing gear per trip. During discussions, however, the concept of 'safety regulations' elicited strong negative reactions. For instance, harvesters felt that the implementation of regulatory safety measures (such as equipment, procedures and training) was rather arbitrary and costly. Clearly, there is support as well as opposition for safety regulations. These differing positions (cf. Poggie et al., 1995) can perhaps be attributed to the fishing subculture that promotes attitudes, beliefs and behaviour that are consistent with independence. However, it is noteworthy that their resistance is not founded on the belief that training or safety measures do not work; instead it is perhaps based on a lack of understanding of how these measures (such as safety equipment, or safety training) can be of benefit to them.

Characteristics attributed to the fishing subculture: denial of danger, independence, fatalism in the face of danger and technological primacy are often cited as explanations of the perceived reluctance toward vessel safety regulations (e.g., Poggie et al., 1995). While pre-training participants of the MEDA1 program also expressed similar views, their aversion seemed rooted more in the distrust of government rather than a subcultural influence. Fish harvesters rely on learning from experiences. Over time, they have witnessed the growing involvement of government regulations that they believe to

be haphazard, costly, and seemingly creating more hurdles and hoops (Kaplan, 2000). Their criticism of government is perhaps no different from other organizations that point out the flaws of implementing rules that may not have considered the ground situation. This is reflected for instance, in the unanimous agreement amongst participants that training is beneficial, however, issues surrounding training such as cost, lack of understanding the specific relevance of training to their job, level of literacy, fear, all impact their decision to attend MEDA1 training.

### 6.3 Impact of the Video Clips in MEDA1 Training

Participants of the enhanced group showed a significant increase in overall knowledge scores as compared to the standard group. There was a significant improvement in five of the individual attitude items (within subscales: skepticism, responsibility and regulations) for the enhanced group compared to an improvement in only two individual items (within subscales: responsibility and boatmanship) for the standard group. This would suggest that participants who had undergone MEDA1 training enhanced with the addition of extra video clips had greater improvement in safety attitudes and knowledge as compared to those who had undergone the regular MEDA1 training. During group discussions, however, participants expressed mixed feelings about the video clips. In the questionnaire, most had written 'good' but some had expressed that while they were good and informative, the clips felt "out dated". While their reactions to the clips were not very favourable, the addition of these clips did appear to reinforce knowledge and attitudes. This is consistent with the proposed alternative model of Kirkpatrick which suggests that it is not necessary to have a favourable reaction to learn (Alliger & Janak, 1989).

Interestingly, more than 50% of the participants from both groups thought boat size was an important contributor of accidents. This number reduced significantly after the training for the standard group. The number increased in the enhanced group, but this was not significant. The ILO (1999), DFO (2000) and TC (2002) report that smaller boat sizes are often involved in more accidents, resulting in more fatalities and injuries than bigger boats. It is unclear why post-training participants of the standard group thought that the size of boat does not matter in accident causation.

Respondents from each group showed a significant change in attitudes toward safety issues. Attitudes toward the MEDA1 program had definitely shifted from it being seen as a nuisance requirement, to it being seen as a useful requirement. Attitudes toward the dangers of the sea had also shifted from defining safety with a fatalistic attitude, to defining it in terms of their ability to survive. While it appears that training has had a 'positive' impact on participants' attitudes, it is possible that there were other extraneous variables at play. These will need to be considered carefully before drawing any conclusions, and for implications for future research.

### 6.4 Safety Training and Conceptual Models

A measure of various factors such as needs assessment, pre-training conditions, training design and methods, post-training conditions, and training evaluation help determine if training works (Tannenbaum & Yukl 1992; Salas & Cannon-Bowers 2001). While this study has only focused on the impact of training, a thorough assessment of the evaluation of training can be gained by looking into each of these factors. Future research in safety training in the fishing industry will need to keep these factors in mind

to take us to the next level of understanding of the specific strengths and weakness of MEDA1 training as it is applies to the fishing industry.

Pre- and post-training discussions showed that training helped to change attitudes of fish harvesters, increased their knowledge and awareness of hazards and of being prepared in the face of danger. This, however, does not mean that there would be a change (using Kirkpatrick's terms) at the behavioural and organizational levels (Alliger & Janak, 1989). A limitation of Kirkpatrick's model as mentioned earlier suggests that it is too simplistic (Alliger & Janak, 1989; Bates, 2004). While it is a useful tool for heuristic information, it fails to consider other variables that may have impacted training outcomes. For instance, a skipper, a fish harvester and a university research scientist who all showed positive reactions to MEDA1 training and exhibited increased knowledge will, undoubtedly, vary in their behaviour and actions after the training. Variables such as individual differences, pre-training environment, and post-training environment all impact the effectiveness of training (Bates, 2004; Salaz & Cannon-Bowers, 2001).

Also, it is not clear whether Kirkpatrick differentiated between learning skills and learning facts and whether the same assessment tool could be applied to both (Kraiger et al., 1993). For instance, fish harvesters showed an increase in knowledge and in learning facts. This was measured using the questionnaire and the actual assessment tool that was being used by OSSC. However, skills learnt during practical sessions could not be measured since there were no formal assessments for the practical sessions at OSSC. Instructors generally assessed learning skills by ensuring that participants followed them by example and by ensuring that each participant completed the required task at hand. Follow up research on behavioural change is necessary to inform our understanding of

the extent to which skills learnt during practical sessions were applied back at the workplace.

The issue of safety in the fishing industry and the role of safety training in the fishing industry need to be viewed holistically and as a component of Reasons' model. Fish harvesters are humans and therefore prone to making errors. Instead of viewing errors as human failure on their part, there is a need to realize that errors are the result of a system failure on some level. For instance, this study has shown how participants carry safety equipment on board to be compliant, however, they have no idea how to use it or indeed that a lack of maintenance is as good as not having the equipment on board. This false sense of security was broken as a result of their training.

Similarly, regulations that require the carriage of safety equipment also provide policy makers and governments with a false sense of security. By supplying safety equipment with what is thought of as relatively easy to follow instructions for operation, and by requiring them onboard, it is assumed that persons will be able to apply/operate during emergencies and thus be safe. This is not always the case. Lack of practical and theoretical knowledge can be detrimental to life and resources. From a systems approach, gear that intends to improve safety must consider the needs of the harvesters and their work environment. Technological evolution such as upgraded safety equipment that is not followed up with safety training of crew may not necessarily reduce occupational hazards (Antão et al., 2008).

In addition to that, the magnitude of problems of safety in this industry will remain if safety measures are dealt with retrospectively and in (relatively) small chunks at a time. If the dangers of commercial fishing are to be reduced, every effort needs to be made to block as many of the defence layers, as identified in Reason's model, as possible:

initial defences, unsafe act, preconditions, line management and high-level decision making. Mandatory safety-training goes a long way in blocking some of the latent and active conditions, but concerted effort of several strategies that are aimed at dealing with other latent and active conditions needs to be made. For instance, training needs to be reinforced with other hazard eliminating strategies such as safety tools that do not hinder work (like PFDs that can be worn at all times when working on deck without hindering movement), fisheries management that is consistent with safe practice and that does not inadvertently create more hazards, and re-training the harvesters at affordable costs.

Some have argued that too much research done in the name of evaluating training, has in effect only measured trainee reaction (Alliger & Janak, 1989). This gives training a bad name (Hale 1984). There are two reasons why the current research is a very important contributor to the industry and to the training literature. First, this is the first research of its kind conducted with fish harvesters of Newfoundland. It serves as a good starting point for further research as it has shown that fish harvesters can benefit from safety-training. The timing and topic is pertinent to the present context as it helps to gain an understanding of fish harvesters' reaction to training. This is a necessary first step before we can look further into what can be done in this area. Second, the results indicate that there were changes in attitudes and significant increases in knowledge, albeit further research is necessary before a definite conclusion can be made. However, this step is also a necessary prerequisite to support the continuation of the MEDAI and to help build on the lessons learnt.

### 6.5 Limitations and Future Directions

Although this study provides significant findings relating attitudes and knowledge to safety training, there are still some limitations that need to be addressed if we are to build upon the current study and guide future research directions. Focus groups, in general, tend to be lively and informative, however, the validity of focus group data depends upon the extent to which participants feel sufficiently comfortable to share their thoughts, beliefs and ideas. Studies on group dynamics suggests a number of variables (such as group cohesiveness, gender, age and moderator bias) that impacts a participants comfort zone and thereby the group dynamics (Stewart, Shamdasani & Rook 2006). Some of the limitations specific to my research are identified below.

In this research, I was able to include one group of offsite participants from a fishing community in Eastport. Participants at Eastport were more cohesive as a group (since they were all fish harvesters from the same community and already knew each other) and were less inhibited by their 'class setting' (it was held at their town fire station where they hold all of their community meetings), and had the comfort of returning to their homes at the end of training every day. Due to limited resources, it was not possible to visit other communities where the OSSC was offering the MEDA1 training and thereby collect sufficient data to compare on-site training held at OSSC classrooms and off-site training held at the various fishing communities. The effectiveness of training, as mentioned previously, is enhanced by examining other variables and as such future research will need to explore possible differences in training due to in-class setting and community setting.

Demographic factors such as income, education, occupation, religion and age, all influence group behaviour (Stewart, Shamdasani & Rook 2006). I did not separate fish

harvesters from non-fish harvesters in my data analysis. Participants who checked the 'other' category in the demographics described themselves as research scientists working with the DFO in offshore vessels, fisheries scientist, shore captain, researcher, an ordinary seaman and a marine geologist. The proportion of 'other' participants in the enhanced group was 17% compared to only 4% in the standard group. Although this difference was not statistically significant, it is possible that this influenced the group's responses to the questionnaire, their cohesiveness and compatibility during discussions.

Gender composition of the group also influences group discussions (Stewart, Shamdasani & Rook 2006). I did not differentiate male and female responses in my data analysis. Nine percent of the participants in the enhanced group were female compared to 21% in the standard group. While this difference was not statistically significant, future studies will benefit from exploring gender differences in safety training.

Also, more attention is needed toward female fish harvesters in this 'masculine' profession of commercial fishing (Binkley, 2000). Research exploring the health of female fish harvesters has suggested that men and women cope differently with stress, anxiety and illness (Howse et al., 2006; Skaptadottir, 2000). Furthermore, women who do not go out to fish also have a vested interest in their communities. They participate in the fishing community through unpaid work such as bookkeeping, cooking for crew and generally provide support to ensure that their husband's fishing enterprise is running well. Some post-training participants stressed the necessity to include wife/girlfriend of fish harvesters and other extended community/family members to participate in the training program as a way to increase community awareness and also as a coping mechanism to deal with anxiety for when their loved ones are out at sea. The very nature of fishing communities (where everyone has a part to play whether it is through paid or

unpaid work) demands that everyone is given the opportunity to undergo a basic safety-training/awareness program. There is an urgent need for further research in this area, especially to explore how women, in particular, perceive the MEDA1 training and to what extent it impacts their health.

### 6.6 Concluding Remarks

About 40,000 fish harvesters and 30,000 processing workers are employed in the fishing industries of Canada (Canadian Council of Professional Fish Harvesters [CCPFH], 2005). It generated approximately $2.2 billion in landed value and $4.5 billion in export value in 2003. Owner-operator enterprises make up a large proportion of the fishing industries of Canada, however, this industry is entering a critical state (CCPFH, 2005). There are fewer incentives for new harvesters to join the fishery. Fishing used to be a family/community affair. Harvesters would raise their children by taking them out to sea from a very young age and learn the trade by way of example. This can no longer be the case. Two reasons were identified during discussions: the most prominent one being that they could not see a future in the fishery. There were so many changes both within the fishery and the wider labour market, that they perceived the fishery to be fighting a losing battle. It would seem that the current generation of fish harvesters is encouraging the next generation to take up other professions that would provide more stable sources of income and job security. Also, TC mandates that vessel owners and skippers are responsible for familiarizing their crew with MEDA1 training. But since there is no funding for MEDA1 training for teenagers, most harvesters felt unable to take teenagers out to sea to learn on the job.

In spite of the current state of affairs of the industry and the dwindling number of new fish harvesters, the importance of safety-training is echoed by participants of the MEDA1. This research has shown that the MEDA1 is having a measurable impact on participants' attitudes and knowledge toward safety. Both in-class lessons and practical lessons appeared to have contributed to increased knowledge, safety-awareness and attitudes toward several issues related to safety at sea. The study, however, needs to be followed up to test for long-term effects and its impact on behavioural changes.

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# APPPENDIX A

# PRE-TRAINING QUESTIONNAIRE

INDIVIDUAL CODE: MEDA1/____

# SAFETY AT SEA: PERCEPTION AND KNOWLEDGE

Please DO NOT write your name on this questionnaire. Please answer ALL questions to the best of your ability. There are no identifying questions. This survey is designed to find out what fish harvesters and general seafarers think and know about safety. It is divided into 4 sections.

**Section I: This section contains a series of biographical questions. Please answer as appropriate:**

1. Principle occupation?

Fish Harvester ( )
Seafarer ( )
Other (please specify below)

_____

2. Gender?

Male ( )
Female ( )

3. Age? _____

4. Years of experience at sea? _____

5. What is your role on the vessel?

Crew ( )
Skipper ( )
Other (please specify below)

_____

6. What size boat do you usually work on?

Less than 35 feet ( )
More than 35 feet ( )

**Section II: This section contains a series of statements about certain aspect of safety. There are no right or wrong answers. Please check ONE response as you believe.**

1. How important do **YOU** think the following factors are in causing accidents at sea?

| Accident cause | Not Important | Slightly Important | Important | Very Important |
|---|---|---|---|---|
| a. Rough seas | ( ) | ( ) | ( ) | ( ) |
| b. Type of fish | ( ) | ( ) | ( ) | ( ) |
| c. Tiredness | ( ) | ( ) | ( ) | ( ) |
| d. Size of boat | ( ) | ( ) | ( ) | ( ) |
| e. Carelessness | ( ) | ( ) | ( ) | ( ) |
| f. Color of boat | ( ) | ( ) | ( ) | ( ) |
| g. Experience of other (crew members) | ( ) | ( ) | ( ) | ( ) |
| h. Time of day | ( ) | ( ) | ( ) | ( ) |
| i. level of safety awareness (of crew members) | ( ) | ( ) | ( ) | ( ) |
| j. Level of safety awareness (of self) | ( ) | ( ) | ( ) | ( ) |
| k. Overworking | ( ) | ( ) | ( ) | ( ) |
| l. Your height | ( ) | ( ) | ( ) | ( ) |
| m. Rushing | ( ) | ( ) | ( ) | ( ) |
| n. Slippery decks | ( ) | ( ) | ( ) | ( ) |
| o. Untidy decks | ( ) | ( ) | ( ) | ( ) |
| p. Water temperature | ( ) | ( ) | ( ) | ( ) |
| q. Bad luck | ( ) | ( ) | ( ) | ( ) |
| r. Sickness | ( ) | ( ) | ( ) | ( ) |

| | | | | |
|---|---|---|---|---|
| s. Overloading | ( ) | ( ) | ( ) | ( ) |
| t. Overpowering/speeding | ( ) | ( ) | ( ) | ( ) |
| u. Stress | ( ) | ( ) | ( ) | ( ) |
| v. Alcohol | ( ) | ( ) | ( ) | ( ) |
| w. Lack of a safety culture | ( ) | ( ) | ( ) | ( ) |
| x. Poor safety regulations | ( ) | ( ) | ( ) | ( ) |
| y. Level of safety training | ( ) | ( ) | ( ) | ( ) |

2. Please indicate how much **YOU** agree or disagree with each statement. There are no right or wrong answers. Please check ONE response for each answer.

| **Statement** | **Strongly Agree** | **Agree** | **Don't Know** | **Disagree** | **Strongly Disagree** |
|---|---|---|---|---|---|
| 1. Personal floatation devices should be worn when working on deck | ( ) | ( ) | ( ) | ( ) | ( ) |
| 2. All boats should have safety inspections every year | ( ) | ( ) | ( ) | ( ) | ( ) |
| 3. Boat decks should be washed down after each working day/end of shift | ( ) | ( ) | ( ) | ( ) | ( ) |
| 4. When not in use all fishing or deck gear should be stored readily on the deck | ( ) | ( ) | ( ) | ( ) | ( ) |
| 5. All the safety equipment you are required to carry clutters up the boat | ( ) | ( ) | ( ) | ( ) | ( ) |
| 6. A fisherman/seafarer is less likely to have an accident if s/he takes safety courses | ( ) | ( ) | ( ) | ( ) | ( ) |

| Statement | Strongly Agree | Agree | Don't Know | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| 7. Fisherman/seafarer should never put to sea in bad weather | ( ) | ( ) | ( ) | ( ) | ( ) |
| 8. The reason I carry the required safety equipment is so that I won't receive a fine. | ( ) | ( ) | ( ) | ( ) | ( ) |
| 9. All too often, strict adherence to the safety rules and regulations cause more trouble than it's worth. | ( ) | ( ) | ( ) | ( ) | ( ) |
| 10. The required safety equipment is too expensive | ( ) | ( ) | ( ) | ( ) | ( ) |
| 11. Many of the present safety regulations are unrealistic and should be changed | ( ) | ( ) | ( ) | ( ) | ( ) |
| 12. Recommended safety procedures work until you become busy | ( ) | ( ) | ( ) | ( ) | ( ) |
| 13. If you are worried about safety you wouldn't get your job done | ( ) | ( ) | ( ) | ( ) | ( ) |
| 14. The government spends too much time and resources on safety at sea | ( ) | ( ) | ( ) | ( ) | ( ) |
| 15. The union should be more concerned with safety issues | ( ) | ( ) | ( ) | ( ) | ( ) |
| 16. The RCMP/Coast Guard have no business boarding a fishing or other vessel | ( ) | ( ) | ( ) | ( ) | ( ) |
| 17. Fishing vessels should be limited as to how far they can travel from shore | ( ) | ( ) | ( ) | ( ) | ( ) |

| Statement | Strongly Agree | Agree | Don't Know | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| 18. Fishing vessels should be limited as to how much fishing gear they carry | ( ) | ( ) | ( ) | ( ) | ( ) |
| 19. Fishing vessels should be limited as to how much fish they carry in one trip | ( ) | ( ) | ( ) | ( ) | ( ) |
| 20. If you follow safety regulations you are less likely to have an accident | ( ) | ( ) | ( ) | ( ) | ( ) |
| 21. I have gone to sea in bad weather in spite of advice from others | ( ) | ( ) | ( ) | ( ) | ( ) |
| 22. I am the type of person who takes risks | ( ) | ( ) | ( ) | ( ) | ( ) |
| 23. Fishing would not be as enjoyable without the risks that are involved | ( ) | ( ) | ( ) | ( ) | ( ) |

**Section III: This section contains a series of questions about safety knowledge. Please circle ONE response:**

1. **What is the most common cause of shipboard accidents?**

    1. The vessels' condition.
    2. Equipment failure.
    3. Environmental conditions.
    4. Human error.

2. **What is the most effective means of preventing accidents?**

    1. Training.
    2. The buddy system.
    3. To only use new equipment.
    4. To make sure all personnel are wearing safety equipment at all times.

3. **What is the purpose of the Muster List?**

    1. To inform individuals of their place of work.
    2. To inform individuals of their responsibilities during a shipboard emergency.
    3. To inform the ship's officers of the cargo onboard.
    4. To inform the owners of defects onboard.

4. **When donning a life jacket, you should ensure that,**

    1. You have the correct size.
    2. The straps are secured correctly.
    3. Attachments are stowed.
    4. All of the above.

5. **On a vessel you may find life jackets stored.**

    1. In crew member cabins.
    2. In the engine room.
    3. In deck storage boxes.
    4. All of the above.

6. **Which of the following may be used as a survival craft?**

1. Liferafts.
2. Approved/suitable boats.
3. Lifeboats.
4. All of the above.

7. **What device is used to launch lifeboats?**

1. Travel lift.
2. Bosun chair.
3. Davit.
4. Shuttle launcher.

8. **What must you ensure before you launch a liferaft?**

1. The anti-wicking device is removed.
2. The painter is tied securely to a strong point on the vessel.
3. The gripe is secured to the vessel.
4. The painter is pulled all the way out and given a sharp tug.

9. **When do life raft pressure relief valves operate?**

1. On inflation.
2. During decreases in temperature.
3. Before the raft is inflated.
4. All of the above.

10. **Why is the floor of a liferaft designed to be inflated?**

1. To make the raft more buoyant.
2. To make the raft less resistance to the sea.
3. To make the raft drift faster.
4. To provide insulation from the water.

11. **What losses does the body suffer during survival situations?**

1. Heat.
2. Water.
3. Energy.
4. All of the above.

12. **How is a survival plan able to help survivors during a survival situation?**

1. It makes sure that all people are at the muster station before abandoning.
2. It gives the survivor a list of essential tasks to be performed and their priority.
3. It informs you exactly what to do in any situation.
4. It ensures that all survivors know who is in charge of the situation.

13. **During a survival situation in a survival craft, who needs to know how to use signaling devices?**

1. The person in charge.
2. The lookouts.
3. The Master.
4. Everyone

14. **Where should your arms be when being lifted by a rescue sling?**

1. Above your head.
2. Wrapped around the lifting wire.
3. Straight out at shoulder level.
4. Firmly down in front of you with hands clasped.

15. **What should you do if you discover your cabin is on fire?**

1. Run to the nearest washroom for a bucket of water?
2. Attempt to remove your personal belongings.
3. Sound the alarm, report the location, fight the fire.
4. Start to fight the fire.

16. **What are the four parts of the fire tetrahedron?**

1. Heat, water, chemical reaction, air.
2. Heat, water, oxygen, carbon dioxide.
3. Heat, fuel, oxygen, chemical reaction.
4. Heat, fuel, oxygen, vapor.

17. **What fuel is involved in a Class B fire?**

1. Wood, paper, or cloth material.
2. Energized electrical equipment
3. Flammable liquids.
4. Combustible metals.

18. **Who is responsible for safety onboard ships?**

1. The employee.
2. The employer.
3. The government.
4. All of the above.

19. **What should your first priority be after abandoning a vessel?**

1. Signaling for help.
2. Making yourself comfortable.
3. Protecting yourself from the environment.
4. Issuing rations.

20. **Why are emergency drills held onboard vessels?**

1. To ensure fast crew reaction in a real emergency.
2. To try and lessen the chance of panic in a real emergency.
3. To try and minimize injury and loss of life during a real emergency.
4. All of the above.

**Section IV: This section contains a series of questions about safety training courses. Please respond as appropriate:**

1. How did you learn about this safety course?

| | |
|---|---|
| Media/Advertisement | ( ) |
| Friends/Family | ( ) |
| Work recommendation | ( ) |

2. Have any of your friends/colleagues taken any safety training courses at OSSC?

| | |
|---|---|
| Some | ( ) |
| Most | ( ) |
| None | ( ) |

3. Have any of your family taken any safety training courses at OSSC?

| | |
|---|---|
| Some | ( ) |
| Most | ( ) |
| None | ( ) |

4. What is the one thing you wish to learn from this course?

_____

5. What major issue regarding safety do you think needs to be addressed in training?

_____

_____

_____

6. How important are the following factors in your decision to attend this class?

| **Factor** | **Not Important** | **Slightly Important** | **Important** | **Very Important** |
|---|---|---|---|---|
| a) Family or friend recommendations | ( ) | ( ) | ( ) | ( ) |
| b) Job requirement | ( ) | ( ) | ( ) | ( ) |
| c) Desire to improve safety knowledge | ( ) | ( ) | ( ) | ( ) |
| d) Regulatory requirement | ( ) | ( ) | ( ) | ( ) |
| e) Cost of training | ( ) | ( ) | ( ) | ( ) |

| Factor | Not Important | Slightly Important | Important | Very Important |
|---|---|---|---|---|
| f) Lack of time | ( ) | ( ) | ( ) | ( ) |
| g) Duration of training | ( ) | ( ) | ( ) | ( ) |
| h) Location | ( ) | ( ) | ( ) | ( ) |
| i) Personal interest | ( ) | ( ) | ( ) | ( ) |
| j) Fear | ( ) | ( ) | ( ) | ( ) |
| k) Level of literacy | ( ) | ( ) | ( ) | ( ) |

l) Other (please specify)_____

7. Have you previously attended any safety training courses? Yes ( ) No ( )

8. Do you feel you have sufficient knowledge to work safely aboard a vessel? Yes ( ) No ( )

9. Do you feel that your colleagues have sufficient knowledge to work safely aboard a vessel? Yes ( ) No ( )

10. Do you know of anyone else who could benefit from this course? Yes ( ) No ( )

11. If yes, do you know why they have not registered for this course?

_____

_____

12. Are you interested in further safety training? Yes ( ) No ( )

13. Are you willing to serve on a local safety committee? Yes ( ) No ( )

14. Do you have ideas that could improve safety in the fishery? Yes ( ) No ( )

15. If yes, have you ever been given the opportunity to voice your ideas? Yes ( )
No ( )

16. Do you think fish harvester/general seafarers should take a course in safety?
Yes ( )
No ( )

17. Do you think safety concern is a personal issue, a governmental issue or both?
Personal ( )
Governmental ( )
Both ( )

18. Do you think safety training helps in real situations? Yes ( )
No ( )

20. What element of the course would you find particularly helpful? (Please be specific)

_____

_____

21. What according to you would be the best part of this course? (Please be specific)

_____

_____

22. What according to you would be the worst part of this course? (Please be specific)

_____

_____

**********

Thank you very much for completing this questionnaire. Please check to see that you have answered **ALL** the questions. If you would like to add anything further, please write below. Please return your questionnaire to your instructor or to the researcher.

# APPENDIX B

# POST-TRAINING QUESTIONNAIRE: STANDARD GROUP

INDIVIDUAL CODE: MEDA1/__

# SAFETY AT SEA: PERCEPTION AND KNOWLEDGE

Please DO NOT write your name on this questionnaire. Please answer ALL questions to the best of your ability. There are no identifying questions. This survey is designed to find out what fish harvesters and general seafarers think and know about safety. It is divided into 3 sections.

**Section II: This section contains a series of statements about certain aspect of safety. There are no right or wrong answers. Please check ONE response as you believe.**

1. How important do **YOU** think the following factors are in causing accidents at sea?

| Accident cause | Not Important | Slightly Important | Important | Very Important |
|---|---|---|---|---|
| z. Rough seas | ( ) | ( ) | ( ) | ( ) |
| aa. Type of fish | ( ) | ( ) | ( ) | ( ) |
| bb. Tiredness | ( ) | ( ) | ( ) | ( ) |
| cc. Size of boat | ( ) | ( ) | ( ) | ( ) |
| dd. Carelessness | ( ) | ( ) | ( ) | ( ) |
| ee. Color of boat | ( ) | ( ) | ( ) | ( ) |
| ff. Experience of other (crew members) | ( ) | ( ) | ( ) | ( ) |
| gg. Time of day | ( ) | ( ) | ( ) | ( ) |
| hh. level of safety awareness (of crew members) | ( ) | ( ) | ( ) | ( ) |
| ii. Level of safety awareness (of self) | ( ) | ( ) | ( ) | ( ) |
| jj. Overworking | ( ) | ( ) | ( ) | ( ) |
| kk. Your height | ( ) | ( ) | ( ) | ( ) |
| ll. Rushing | ( ) | ( ) | ( ) | ( ) |
| mm. Slippery decks | ( ) | ( ) | ( ) | ( ) |
| nn. Untidy decks | ( ) | ( ) | ( ) | ( ) |
| oo. Water temperature | ( ) | ( ) | ( ) | ( ) |
| pp. Bad luck | ( ) | ( ) | ( ) | ( ) |
| qq. Sickness | ( ) | ( ) | ( ) | ( ) |
| rr. Overloading | ( ) | ( ) | ( ) | ( ) |

| | | | | |
|---|---|---|---|---|
| ss. Overpowering/speeding | ( ) | ( ) | ( ) | ( ) |
| tt. Stress | ( ) | ( ) | ( ) | ( ) |
| uu. Alcohol | ( ) | ( ) | ( ) | ( ) |
| vv. Lack of a safety culture | ( ) | ( ) | ( ) | ( ) |
| ww. Poor safety regulations | ( ) | ( ) | ( ) | ( ) |
| xx. Level of safety training | ( ) | ( ) | ( ) | ( ) |

2. Please indicate how much **YOU** agree or disagree with each statement. There are no right or wrong answers. Please check ONE response for each answer.

| **Statement** | **Strongly Agree** | **Agree** | **Don't Know** | **Disagree** | **Strongly Disagree** |
|---|---|---|---|---|---|
| 1. Personal floatation devices should be worn when working on deck | ( ) | ( ) | ( ) | ( ) | ( ) |
| 2. All boats should have safety inspections every year | ( ) | ( ) | ( ) | ( ) | ( ) |
| 3. Boat decks should be washed down after each working day/end of shift | ( ) | ( ) | ( ) | ( ) | ( ) |
| 4. When not in use all fishing or deck gear should be stored readily on the deck | ( ) | ( ) | ( ) | ( ) | ( ) |
| 5. All the safety equipment you are required to carry clutters up the boat | ( ) | ( ) | ( ) | ( ) | ( ) |
| 6. A fisherman/seafarer is less likely to have an accident if s/he takes safety courses | ( ) | ( ) | ( ) | ( ) | ( ) |

| Statement | Strongly Agree | Agree | Don't Know | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| 7. Fisherman/seafarer should never put to sea in bad weather | ( ) | ( ) | ( ) | ( ) | ( ) |
| 8. The reason I carry the required safety equipment is so that I won't receive a fine. | ( ) | ( ) | ( ) | ( ) | ( ) |
| 9. All too often, strict adherence to the safety rules and regulations cause more trouble than it's worth. | ( ) | ( ) | ( ) | ( ) | ( ) |
| 10. The required safety equipment is too expensive | ( ) | ( ) | ( ) | ( ) | ( ) |
| 11. Many of the present safety regulations are unrealistic and should be changed | ( ) | ( ) | ( ) | ( ) | ( ) |
| 12. Recommended safety procedures work until you become busy | ( ) | ( ) | ( ) | ( ) | ( ) |
| 13. If you are worried about safety you wouldn't get your job done | ( ) | ( ) | ( ) | ( ) | ( ) |
| 14. The government spends too much time and resources on safety at sea | ( ) | ( ) | ( ) | ( ) | ( ) |
| 15. The union should be more concerned with safety issues | ( ) | ( ) | ( ) | ( ) | ( ) |
| 16. The RCMP/Coast Guard have no business boarding a fishing or other vessel | ( ) | ( ) | ( ) | ( ) | ( ) |
| 17. Fishing vessels should be limited as to how far they can travel from shore | ( ) | ( ) | ( ) | ( ) | ( ) |

| Statement | Strongly Agree | Agree | Don't Know | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| 18. Fishing vessels should be limited as to how much fishing gear they carry | ( ) | ( ) | ( ) | ( ) | ( ) |
| 19. Fishing vessels should be limited as to how much fish they carry in one trip | ( ) | ( ) | ( ) | ( ) | ( ) |
| 20. If you follow safety regulations you are less likely to have an accident | ( ) | ( ) | ( ) | ( ) | ( ) |
| 21. I have gone to sea in bad weather in spite of advice from others | ( ) | ( ) | ( ) | ( ) | ( ) |
| 22. I am the type of person who takes risks | ( ) | ( ) | ( ) | ( ) | ( ) |
| 23. Fishing would not be as enjoyable without the risks that are involved | ( ) | ( ) | ( ) | ( ) | ( ) |

**Section II: This section contains a series of questions about safety knowledge. Please circle ONE response:**

1. **What is the most common cause of shipboard accidents?**

    1. The vessels' condition.
    2. Equipment failure.
    3. Environmental conditions.
    4. Human error.

2. **What is the most effective means of preventing accidents?**

    1. Training.
    2. The buddy system.
    3. To only use new equipment.
    4. To make sure all personnel are wearing safety equipment at all times.

3. **What is the purpose of the Muster List?**

    1. To inform individuals of their place of work.
    2. To inform individuals of their responsibilities during a shipboard emergency.
    3. To inform the ship's officers of the cargo onboard.
    4. To inform the owners of defects onboard.

4. **When donning a life jacket, you should ensure that,**

    1. You have the correct size.
    2. The straps are secured correctly.
    3. Attachments are stowed.
    4. All of the above.

5. **On a vessel you may find life jackets stored.**

    1. In crew member cabins.
    2. In the engine room.
    3. In deck storage boxes.
    4. All of the above.

6. **Which of the following may be used as a survival craft?**

1. Liferafts.
2. Approved/suitable boats.
3. Lifeboats.
4. All of the above.

7. **What device is used to launch lifeboats?**

1. Travel lift.
2. Bosun chair.
3. Davit.
4. Shuttle launcher.

8. **What must you ensure before you launch a liferaft?**

1. The anti-wicking device is removed.
2. The painter is tied securely to a strong point on the vessel.
3. The gripe is secured to the vessel.
4. The painter is pulled all the way out and given a sharp tug.

9. **When do life raft pressure relief valves operate?**

1. On inflation.
2. During decreases in temperature.
3. Before the raft is inflated.
4. All of the above.

10. **Why is the floor of a liferaft designed to be inflated?**

1. To make the raft more buoyant.
2. To make the raft less resistance to the sea.
3. To make the raft drift faster.
4. To provide insulation from the water.

11. **What losses does the body suffer during survival situations?**

1. Heat.
2. Water.
3. Energy.
4. All of the above.

12. **How is a survival plan able to help survivors during a survival situation?**

5. It makes sure that all people are at the muster station before abandoning.
6. It gives the survivor a list of essential tasks to be performed and their priority.
7. It informs you exactly what to do in any situation.
8. It ensures that all survivors know who is in charge of the situation.

**14. During a survival situation in a survival craft, who needs to know how to use signaling devices?**

5. The person in charge.
6. The lookouts.
7. The Master.
8. Everyone

14. **Where should your arms be when being lifted by a rescue sling?**

1. Above your head.
2. Wrapped around the lifting wire.
3. Straight out at shoulder level.
4. Firmly down in front of you with hands clasped.

15. **What should you do if you discover your cabin is on fire?**

5. Run to the nearest washroom for a bucket of water?
6. Attempt to remove your personal belongings.
7. Sound the alarm, report the location, fight the fire.
8. Start to fight the fire.

16. **What are the four parts of the fire tetrahedron?**

1. Heat, water, chemical reaction, air.
2. Heat, water, oxygen, carbon dioxide.
3. Heat, fuel, oxygen, chemical reaction.
4. Heat, fuel, oxygen, vapor.

17. **What fuel is involved in a Class B fire?**

5. Wood, paper, or cloth material.
6. Energized electrical equipment
7. Flammable liquids.
8. Combustible metals.

18. **Who is responsible for safety onboard ships?**

1. The employee.
2. The employer.
3. The government.
4. All of the above.

19. **What should your first priority be after abandoning a vessel?**

5. Signaling for help.
6. Making yourself comfortable.
7. Protecting yourself from the environment.
8. Issuing rations.

20. **Why are emergency drills held onboard vessels?**

5. To ensure fast crew reaction in a real emergency.
6. To try and lessen the chance of panic in a real emergency.
7. To try and minimize injury and loss of life during a real emergency.
8. All of the above.

**Section III: This section contains a series of questions about safety training courses. Please respond as appropriate:**

19. What was a new lesson for you in this course? Please be specific.

---

20. What major issue regarding safety do you think needs to be addressed in training?

---

---

---

21. Do you feel you have sufficient knowledge to work safely aboard a vessel?
    Yes ( )
    No ( )

22. Do you feel that your colleagues have sufficient knowledge to work safely aboard a vessel?
    Yes ( )
    No ( )

23. Do you know of anyone else who could benefit from this course? Yes ( )
    No ( )

24. If yes, do you know why they have not registered for this course?

---

---

25. Are you interested in further safety training? Yes ( )
    No ( )

26. Do you think fish harvester/general seafarers should take a course in safety?
    Yes ( )
    No ( )

27. Do you think safety training helps in real situations? Yes ( )
    No ( )

10. What element of the course did you find particularly helpful? (Please be specific)

---

---

11. What according to you would be the best part of this course? (Please be specific)

_____

_____

12. What according to you would be the worst part of this course? (Please be specific)

_____

_____

13. What did you think of the following aspect of the course?
a) Classroom
Discussions_____

_____

b) Classroom
Pressentations_____

_____

c) Practical
Exercises_____

_____

**********

Thank you very much for completing this questionnaire. Please check to see that you have answered **ALL** the questions. If you would like to add anything further, please write below. Please return your questionnaire to your instructor or to the researcher.

# APPENDIX C

# POST-TRAINING QUESTIONNAIRE: ENHANCED GROUP

INDIVIDUAL CODE: MEDA1/__

# SAFETY AT SEA: PERCEPTION AND KNOWLEDGE

Please DO NOT write your name on this questionnaire. Please answer ALL questions to the best of your ability. There are no identifying questions. This survey is designed to find out what fish harvesters and general seafarers think and know about safety. It is divided into 3 sections.

**Section II: This section contains a series of statements about certain aspect of safety. There are no right or wrong answers. Please check ONE response as you believe.**

1. How important do **YOU** think the following factors are in causing accidents at sea?

| Accident cause | Not Important | Slightly Important | Important | Very Important |
|---|---|---|---|---|
| yy. Rough seas | ( ) | ( ) | ( ) | ( ) |
| zz. Type of fish | ( ) | ( ) | ( ) | ( ) |
| aaa. Tiredness | ( ) | ( ) | ( ) | ( ) |
| bbb. Size of boat | ( ) | ( ) | ( ) | ( ) |
| ccc. Carelessness | ( ) | ( ) | ( ) | ( ) |
| ddd. Color of boat | ( ) | ( ) | ( ) | ( ) |
| eee. Other crew members | ( ) | ( ) | ( ) | ( ) |
| fff. Time of day | ( ) | ( ) | ( ) | ( ) |
| ggg. level of safety awareness (of crew members) | ( ) | ( ) | ( ) | ( ) |
| hhh. Level of safety awareness (of self) | ( ) | ( ) | ( ) | ( ) |
| iii. Overworking | ( ) | ( ) | ( ) | ( ) |
| jjj. Your height | ( ) | ( ) | ( ) | ( ) |
| kkk. Rushing | ( ) | ( ) | ( ) | ( ) |
| lll. Slippery decks | ( ) | ( ) | ( ) | ( ) |
| mmm. Untidy decks | ( ) | ( ) | ( ) | ( ) |
| nnn. Water temperature | ( ) | ( ) | ( ) | ( ) |
| ooo. Bad luck | ( ) | ( ) | ( ) | ( ) |
| ppp. Sickness | ( ) | ( ) | ( ) | ( ) |
| qqq. Overloading | ( ) | ( ) | ( ) | ( ) |

| | | | | | |
|---|---|---|---|---|---|
| rrr. Overpowering/speeding | ( ) | ( ) | ( ) | ( ) | |
| sss. Stress | ( ) | ( ) | ( ) | ( ) | |
| ttt. Alcohol | ( ) | ( ) | ( ) | ( ) | |
| uuu. Lack of a safety culture | ( ) | ( ) | ( ) | ( ) | |
| vvv. Poor safety regulations | ( ) | ( ) | ( ) | ( ) | |
| www. Level of safety training | ( ) | ( ) | ( ) | ( ) | |

2. Please indicate how much **YOU** agree or disagree with each statement. There are no right or wrong answers. Please check ONE response for each answer.

| **Statement** | **Strongly Agree** | **Agree** | **Don't Know** | **Disagree** | **Strongly Disagree** |
|---|---|---|---|---|---|
| 1. Personal floatation devices should be worn when working on deck | ( ) | ( ) | ( ) | ( ) | ( ) |
| 2. All boats should have safety inspections every year | ( ) | ( ) | ( ) | ( ) | ( ) |
| 3. Boat decks should be washed down after each working day/end of shift | ( ) | ( ) | ( ) | ( ) | ( ) |
| 4. When not in use all fishing or deck gear should be stored readily on the deck | ( ) | ( ) | ( ) | ( ) | ( ) |
| 5. All the safety equipment you are required to carry clutters up the boat | ( ) | ( ) | ( ) | ( ) | ( ) |
| 6. A fisherman/seafarer is less likely to have an accident if s/he takes safety courses | ( ) | ( ) | ( ) | ( ) | ( ) |

| Statement | Strongly Agree | Agree | Don't Know | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| 7. Fisherman/seafarer should never put to sea in bad weather | ( ) | ( ) | ( ) | ( ) | ( ) |
| 8. The reason I carry the required safety equipment is so that I won't receive a fine. | ( ) | ( ) | ( ) | ( ) | ( ) |
| 9. All too often, strict adherence to the safety rules and regulations cause more trouble than it's worth. | ( ) | ( ) | ( ) | ( ) | ( ) |
| 10. The required safety equipment is too expensive | ( ) | ( ) | ( ) | ( ) | ( ) |
| 11. Many of the present safety regulations are unrealistic and should be changed | ( ) | ( ) | ( ) | ( ) | ( ) |
| 12. Recommended safety procedures work until you become busy | ( ) | ( ) | ( ) | ( ) | ( ) |
| 13. If you are worried about safety you wouldn't get your job done | ( ) | ( ) | ( ) | ( ) | ( ) |
| 14. The government spends too much time and resources on safety at sea | ( ) | ( ) | ( ) | ( ) | ( ) |
| 15. The union should be more concerned with safety issues | ( ) | ( ) | ( ) | ( ) | ( ) |
| 16. The RCMP/Coast Guard have no business boarding a fishing or other vessel | ( ) | ( ) | ( ) | ( ) | ( ) |
| 17. Fishing vessels should be limited as to how far they can travel from shore | ( ) | ( ) | ( ) | ( ) | ( ) |

| Statement | Strongly Agree | Agree | Don't Know | Disagree | Strongly Disagree |
|---|---|---|---|---|---|
| 18. Fishing vessels should be limited as to how much fishing gear they carry | ( ) | ( ) | ( ) | ( ) | ( ) |
| 19. Fishing vessels should be limited as to how much fish they carry in one trip | ( ) | ( ) | ( ) | ( ) | ( ) |
| 20. If you follow safety regulations you are less likely to have an accident | ( ) | ( ) | ( ) | ( ) | ( ) |
| 21. I have gone to sea in bad weather in spite of advice from others | ( ) | ( ) | ( ) | ( ) | ( ) |
| 22. I am the type of person who takes risks | ( ) | ( ) | ( ) | ( ) | ( ) |
| 23. Fishing would not be as enjoyable without the risks that are involved | ( ) | ( ) | ( ) | ( ) | ( ) |

**Section II: This section contains a series of questions about safety knowledge. Please circle ONE response:**

1. **What is the most common cause of shipboard accidents?**

    1. The vessels' condition.
    2. Equipment failure.
    3. Environmental conditions.
    4. Human error.

2. **What is the most effective means of preventing accidents?**

    1. Training.
    2. The buddy system.
    3. To only use new equipment.
    4. To make sure all personnel are wearing safety equipment at all times.

3. **What is the purpose of the Muster List?**

    1. To inform individuals of their place of work.
    2. To inform individuals of their responsibilities during a shipboard emergency.
    3. To inform the ship's officers of the cargo onboard.
    4. To inform the owners of defects onboard.

4. **When donning a life jacket, you should ensure that,**

    1. You have the correct size.
    2. The straps are secured correctly.
    3. Attachments are stowed.
    4. All of the above.

5. **On a vessel you may find life jackets stored.**

    1. In crew member cabins.
    2. In the engine room.
    3. In deck storage boxes.
    4. All of the above.

6. **Which of the following may be used as a survival craft?**

1. Liferafts.
2. Approved/suitable boats.
3. Lifeboats.
4. All of the above.

7. **What device is used to launch lifeboats?**

1. Travel lift.
2. Bosun chair.
3. Davit.
4. Shuttle launcher.

8. **What must you ensure before you launch a liferaft?**

1. The anti-wicking device is removed.
2. The painter is tied securely to a strong point on the vessel.
3. The gripe is secured to the vessel.
4. The painter is pulled all the way out and given a sharp tug.

9. **When do life raft pressure relief valves operate?**

1. On inflation.
2. During decreases in temperature.
3. Before the raft is inflated.
4. All of the above.

10. **Why is the floor of a liferaft designed to be inflated?**

1. To make the raft more buoyant.
2. To make the raft less resistance to the sea.
3. To make the raft drift faster.
4. To provide insulation from the water.

11. **What losses does the body suffer during survival situations?**

1. Heat.
2. Water.
3. Energy.
4. All of the above.

12. **How is a survival plan able to help survivors during a survival situation?**

9. It makes sure that all people are at the muster station before abandoning.
10. It gives the survivor a list of essential tasks to be performed and their priority.
11. It informs you exactly what to do in any situation.
12. It ensures that all survivors know who is in charge of the situation.

**15. During a survival situation in a survival craft, who needs to know how to use signaling devices?**

9. The person in charge.
10. The lookouts.
11. The Master.
12. Everyone

14. **Where should your arms be when being lifted by a rescue sling?**

1. Above your head.
2. Wrapped around the lifting wire.
3. Straight out at shoulder level.
4. Firmly down in front of you with hands clasped.

15. **What should you do if you discover your cabin is on fire?**

9. Run to the nearest washroom for a bucket of water?
10. Attempt to remove your personal belongings.
11. Sound the alarm, report the location, fight the fire.
12. Start to fight the fire.

16. **What are the four parts of the fire tetrahedron?**

1. Heat, water, chemical reaction, air.
2. Heat, water, oxygen, carbon dioxide.
3. Heat, fuel, oxygen, chemical reaction.
4. Heat, fuel, oxygen, vapor.

17. **What fuel is involved in a Class B fire?**

9. Wood, paper, or cloth material.
10. Energized electrical equipment
11. Flammable liquids.
12. Combustible metals.

18. **Who is responsible for safety onboard ships?**

1. The employee.
2. The employer.
3. The government.
4. All of the above.

19. **What should your first priority be after abandoning a vessel?**

9. Signaling for help.
10. Making yourself comfortable.
11. Protecting yourself from the environment.
12. Issuing rations.

20. **Why are emergency drills held onboard vessels?**

9. To ensure fast crew reaction in a real emergency.
10. To try and lessen the chance of panic in a real emergency.
11. To try and minimize injury and loss of life during a real emergency.
12. All of the above.

**Section III: This section contains a series of questions about safety training courses. Please respond as appropriate:**

28. What was a new lesson for you in this course? Please be specific.

_____

29. What major issue regarding safety do you think needs to be addressed in training?

_____

_____

_____

30. Do you feel you have sufficient knowledge to work safely aboard a vessel?
Yes ( )
No ( )

31. Do you feel that your colleagues have sufficient knowledge to work safely aboard a vessel?
Yes ( )
No ( )

32. Do you know of anyone else who could benefit from this course? Yes ( )
No ( )

33. If yes, do you know why they have not registered for this course?

_____

_____

34. Are you interested in further safety training? Yes ( )
No ( )

35. Do you think fish harvester/general seafarers should take a course in safety?
Yes ( )
No ( )

36. Do you think safety training helps in real situations? Yes ( )
No ( )

10. What element of the course did you find particularly helpful? (Please be specific)

_____

_____

11. What according to you would be the best part of this course? (Please be specific)

_____

_____

12. What according to you would be the worst part of this course? (Please be specific)

_____

_____

13. What did you think of the following aspect of the course?
a) Classroom
Discussions_____

_____

b) Classroom
Pressentations_____

_____

c) Practical
Exercises_____

_____

d) Video Clips on
Safety_____

_____

**********

Thank you very much for completing this questionnaire. Please check to see that you have answered **ALL** the questions. If you would like to add anything further, please write below. Please return your questionnaire to your instructor or to the researcher.

# APPENDIX D

# HIC APPROVAL

# APPENDIX E

# CONSENT FORM: STANDARD GROUP

*October 2003*

**Faculty of Medicine, Schools of Nursing and Pharmacy of Memorial University of Newfoundland; Health Care Corporation, St. John's; Newfoundland Cancer Treatment and Research Foundation**

## Consent to Take Part in Health Research

**TITLE**: Impact of Safety Training on Fish Harvesters' and General Seafarers' Knowledge and Perception of Safety

**INVESTIGATOR(S)**: Sophia Jasmin Shaikh

**SPONSOR**: SafetyNet

**You have been invited to take part in a research study. It is up to you to decide whether to be in the study or not. Before you decide, you need to understand what the study is for, what risks you might take and what benefits you might receive. This consent form explains the study.**

**The researchers will:**

- **discuss the study with you**
- **answer your questions**
- **keep confidential any information which could identify you personally**
- **be available during the study to deal with problems and answer questions**

**If you decide not to take part or to leave the study this will not affect your student status or work status**

**1. Introduction/Background:**

As you may already be aware, commercial fishing is known as one of the most dangerous occupations in Canada. A survey of fish harvester in Newfoundland in the early 90's found that all those who were surveyed had incurred some form of injury in the fishing industry. Research in other industries shows that safety training is beneficial and that a lack of safety training or even inadequate training can lead to injury and death of workers. There is, however, no published literature evaluating the effectiveness of safety training programs in the Newfoundland fishery. As training courses are now mandatory for all seafarers (including fish harvesters) and it is a cost and time investment for both the individual and the government, it is essential to investigate the effectiveness of these programs.

**2. Purpose of study:**
The purpose of this study is to evaluate the impact of safety training.

**3. Description of the study procedures and tests:**
As a participant of safety training, you are asked to complete questionnaires and participate in group discussions regarding safety issues before and after your lesson. The group discussions will be audio taped.

**4. Length of time:**
Questionnaires and group discussions will be integrated as part of the course and will last approximately 1 hour.

**5. Possible risks and discomforts:**
Time involved may be a discomfort. There are no anticipated risks. If you feel discomfort as a result of the research, you may withdraw at any time.

**6. Benefits:**
No direct benefits will accrue to participants other than the knowledge and satisfaction of potentially contributing to safety training.

**7. Liability statement:**

**Signing this form gives us your consent to be in this study. It tells us that you understand the information about the research study. When you sign this form, you do not give up your legal rights. Researchers or agencies involved in this research study still have their legal and professional responsibilities.**

**8. Confidentiality:**
All information regarding this study will be kept confidential. We will destroy any identifying information and only data pertaining to the study will be kept in password protected computer files.

**9. Questions:**

**If you have any questions about taking part in this study, you can meet with the investigator who is in charge of the study at this institution. That person is:**

**Sophia J. Shaikh. Email: u65sjs@mun.ca**

**Or you can talk to someone who is not involved with the study at all, but can advise you on your rights as a participant in a research study. This person can be reached through:**

**Office of the Human Investigation Committee (HIC) at 709-777-6974**
**Email: hic@mun.ca**

**Signature Page**

**Study title**: Impact of Safety Training on Fish Harvesters Knowledge and Perception of Safety

**Name of principal investigator**: Sophia Jasmin Shaikh

**To be filled out and signed by the participant:**

| | Please check as appropriate: | |
|---|---|---|
| I have read the consent [and information sheet]. | Yes { } | No { } |
| I have had the opportunity to ask questions/to discuss this study. | Yes { } | No { } |
| I have received satisfactory answers to all of my questions. | Yes { } | No { } |
| I have received enough information about the study. | Yes { } | No { } |
| I have spoken to Sophia Shaikh and she has answered my questions | Yes { } | No { } |
| I understand that I am free to withdraw from the study | Yes { } | No { } |

- at any time
- without having to give a reason
- without affecting my future student status

I understand that it is my choice to be in the study and that I may not benefit. Yes { } No { }

I agree to take part in this study. Yes { } No { }

_____ _____
Signature of participant Date

_____ _____
Signature of witness Date

**To be signed by the investigator:**

I have explained this study to the best of my ability. I invited questions and gave answers. I believe that the participant fully understands what is involved in being in the study, any potential risks of the study and that he or she has freely chosen to be in the study.

_____ _____
Signature of investigator Date

Telephone number: _____

**Assent of minor participant (if appropriate):**

_____ _____
Signature of minor participant Date

_____ _____
Relationship to participant named above Age

# APPENDIX F

# CONSENT FORM: ENHANCED GROUP

*October 2003*

**Faculty of Medicine, Schools of Nursing and Pharmacy of Memorial University of Newfoundland; Health Care Corporation, St. John's; Newfoundland Cancer Treatment and Research Foundation**

## Consent to Take Part in Health Research

**TITLE**: Impact of Safety Training on Fish Harvesters' and General Seafarers' Knowledge and Perception of Safety

**INVESTIGATOR(S)**: Sophia Jasmin Shaikh

**SPONSOR**: SafetyNet

**You have been invited to take part in a research study. It is up to you to decide whether to be in the study or not. Before you decide, you need to understand what the study is for, what risks you might take and what benefits you might receive. This consent form explains the study.**

**The researchers will:**

- **discuss the study with you**
- **answer your questions**
- **keep confidential any information which could identify you personally**
- **be available during the study to deal with problems and answer questions**

**If you decide not to take part or to leave the study this will not affect your student status or work status**

**2. Introduction/Background:**

As you may already be aware, commercial fishing is known as one of the most dangerous occupations in Canada. A survey of fish harvester in Newfoundland in the early 90's found that all those who were surveyed had incurred some form of injury in the fishing industry. Research in other industries shows that safety training is beneficial and that a lack of safety training or even inadequate training can lead to injury and death of workers. There is, however, no published literature evaluating the effectiveness of safety training programs in the Newfoundland fishery. As training courses are now mandatory for all seafarers (including fish harvesters) and it is a cost and time investment for both the individual and the government, it is essential to investigate the effectiveness of these programs.

**2. Purpose of study:**
The purpose of this study is to evaluate the impact of safety training.

**3. Description of the study procedures and tests:**
As a participant of safety training, you are asked to complete questionnaires and participate in group discussions regarding safety issues before and after your lesson. Your lesson will include video clips on safety. The group discussions will be audio taped.

**4. Length of time:**
Questionnaires and group discussions will be integrated as part of the course and will last approximately 1 hour.

**5. Possible risks and discomforts:**
Time involved may be a discomfort. There are no anticipated risks. If you feel discomfort as a result of the research, you may withdraw at any time.

**6. Benefits:**
No direct benefits will accrue to participants other than the knowledge and satisfaction of potentially contributing to safety training.

**7. Liability statement:**

**Signing this form gives us your consent to be in this study. It tells us that you understand the information about the research study. When you sign this form, you do not give up your legal rights. Researchers or agencies involved in this research study still have their legal and professional responsibilities.**

**8. Confidentiality:**
All information regarding this study will be kept confidential. We will destroy any identifying information and only data pertaining to the study will be kept in password protected computer files.

**9. Questions:**
**If you have any questions about taking part in this study, you can meet with the investigator who is in charge of the study at this institution. That person is:**

**Sophia J. Shaikh. Email: u65sjs@mun.ca**

**Or you can talk to someone who is not involved with the study at all, but can advise you on your rights as a participant in a research study. This person can be reached through:**

**Office of the Human Investigation Committee (HIC) at 709-777-6974**
**Email: hic@mun.ca**

**Signature Page**

**Study title**: Impact of Safety Training on Fish Harvesters Knowledge and Perception of Safety

**Name of principal investigator**: Sophia Jasmin Shaikh

**To be filled out and signed by the participant:**

| | Please check as appropriate: | |
|---|---|---|
| I have read the consent [and information sheet]. | Yes { } | No { } |
| I have had the opportunity to ask questions/to discuss this study. | Yes { } | No { } |
| I have received satisfactory answers to all of my questions. | Yes { } | No { } |
| I have received enough information about the study. | Yes { } | No { } |
| I have spoken to Sophia Shaikh and she has answered my questions | Yes { } | No { } |
| I understand that I am free to withdraw from the study | Yes { } | No { } |

- at any time
- without having to give a reason
- without affecting my future student status

I understand that it is my choice to be in the study and that I may not benefit. Yes { } No { }

I agree to take part in this study. Yes { } No { }

_____ _____

Signature of participant Date

_____ _____

Signature of witness Date

**To be signed by the investigator:**

I have explained this study to the best of my ability. I invited questions and gave answers. I believe that the participant fully understands what is involved in being in the study, any potential risks of the study and that he or she has freely chosen to be in the study.

_____ _____

Signature of investigator Date

Telephone number: _____

**Assent of minor participant (if appropriate):**

_____ _____

Signature of minor participant Date

_____ _____

Relationship to participant named above Age

# APPENDIX G

# FOCUS GROUP QUESTIONS

## GROUP DISCUSSION GUIDELINES (BEFORE)

1. How did you hear about this safety training course?
2. Have you previously attended this safety training course? Have you attended any other safety training courses?
2. Do you know anyone who has taken this safety training course?
3. Why did you choose to register for this course? What encouraged you to come?
4. Do you know anything about this course?
5. Are there any specific lessons you are interested to learn from this course?
6. Are safety training courses of any use in real life?

## GROUP DISCUSSION GUIDELINES (AFTER)

1. What are some of the lessons that were new to you? Can you state at least one new lesson?
2. Did you achieve what you came for? Do you think this added to your knowledge of safety?
3. Do you think there should be more safety training?
4. Did any of the lessons change your perception of safety?
5. Would you encourage others to attend?
6. Can anyone remember any video clips? (ONLY FOR THE EXPERIMENTAL GROUP)
6. What did you think of the video clips on safety? (ONLY FOR THE EXPERIMENTAL GROUP)