



Research Article

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# Evaluation of Effectiveness of Information, Education and Communication Package on Knowledge Regarding Occupational Health Hazards and their Prevention among Sailors

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## Abstract

**Introduction:** Working on ships has its perks, but it is a well known fact that working at the sea is one of the most hazardous occupations, in regards to personal health and safety concerns of sailors. Sailors are exceptional in their profession, having to spend a large part of their lives at sea. The main objectives of the study were to prepare IEC package on prevention of occupational health hazards, to evaluate the effectiveness of IEC package on knowledge regarding occupational health hazards among sailors, and to find out association between the knowledge scores of sailors regarding occupational health hazards and its management with selected demographic variables.

**Methods:** A quantitative (experimental) research approach was used with Solomon group four designs in the present study. The study was conducted at Anglo Eastern Maritime Training Centre, New Delhi, on 60 sailors. The tool developed and utilized for the data collection were structured knowledge questionnaire to assess the knowledge regarding occupational hazards and their prevention among sailors before and after administration of the IEC package.

**Findings:** The mean post knowledge scores were found to be higher than the mean pretest knowledge scores after administering IEC package. IEC package was found effective at 0.05 level of significance by using paired t test which showed increase in the knowledge to prevent occupational health hazards. Religion and work experience were found to be significantly related to knowledge regarding occupational health hazards and its management.

**Keywords:** Knowledge; IEC package; Sailors; Effectiveness; Occupational health hazards

of their self-identity.1:Occupational accident and 160 million work related illnesses occur annually. Approximately 2.3 million individuals lose their lives due to work-related accidents or diseases every year which is 6000 deaths every single day. While efforts are made to reduce hazards, these hazards remain present in the workplace by nature of the profession.2: Working on ships has its perks, but it is a well-known fact that working at the sea is one of the most hazardous occupations, in regard to personal health and safety concerns of sailors. Sailors are exceptional in their profession, having to spend a large part of their lives at sea. They are exposed to occupational risk factors as part of their normal, everyday activities.3: Shipping is one of the most dangerous industries in the world; between 2003-2012, the fatal accident rate in shipping was 21 times than that of the other workforce. 4: Maritime working environment comprises the physical, ergonomic, chemical, biological, psychological and social elements which could lead to occupational accidents, injuries and diseases. Seafarers face demanding working conditions, isolation, long hours of work, rigid organizational structures and high levels of stress and fatigue. Kristiansen (2005) found that shipping has a fatality frequency of 1.9-2.1 per thousand, against 0.15 for industry, 0.3 for construction and 0.9-1.4 for mining.

The environment in which a Sailor works and lives can be much difficult than those on land, Sailors both work and live in the same place for varying lengths of time, at times away from their usual place of residence. The time varies from hours in ferries to months in ships carrying cargoes to distant countries. Seafarers' stays being restricted more or less to port towns or cities, they are therefore, at the risk of contracting infectious diseases at ports of call in different countries. The ILO/WHO committee (ILO 1994) on the health of seafarers at their 1993 meeting identified Human Immunodeficiency Virus (HIV) infection/Acquired Immunodeficiency Syndrome (AIDS) and Hepatitis B infection as infectious diseases against which there should be provisions for guidance on prevention.

Although sailors go through a strict medical test before joining a vessel, it is evident that the life of sailors is constantly at risk while out at sea and what makes it more worse is the lack of professional medical attendance and lack of knowledge on board. This study attempted to create awareness about the occupational health hazards and their prevention among sailors. Occupational safety and health is good for business as well as being a legal and social obligation. IEC could be a valuable tool for improving the knowledge about occupational health hazards among sailors and will also enhance their skills to prevent complication and save life when the need arises.

From the various studies carried on the sailors it is clear that the knowledge of sailors going onboard should be assessed not only to prevent the various types of occupational hazards but also to broaden their vistas regarding any emergency situation. Literature review shows that a very few studies have been conducted in India to evaluate the effectiveness of IEC package on the knowledge regarding occupational health hazard among sailors. Investigator in her personal interaction with few sailors observed that not much is known about the various occupational hazards on ships and felt that assessing their knowledge regarding various health hazards would curb and help in preventing occupational hazards onboard. Hence, the investigator planned to prepare IEC package on prevention of occupational health hazards, to evaluate the effectiveness of IEC package on knowledge regarding occupational health hazards among sailors, and to find out association

## Introduction

Work is considered a basic part of life experience. Most adults spend approximately ¼ to 1/3 of their time at work and perceive work as part

between the knowledge scores of sailors regarding occupational health hazards and its management with selected demographic variables.

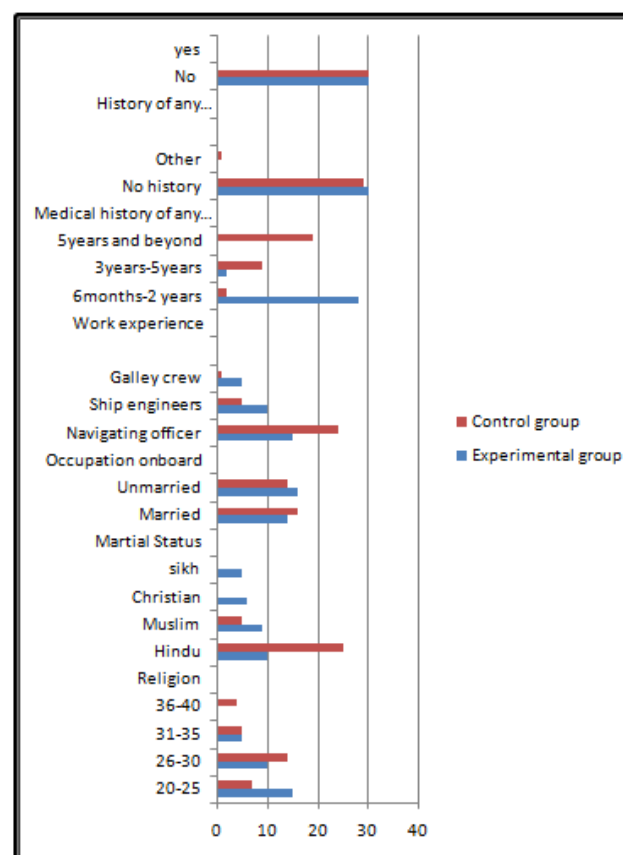
## Materials and Methods

Keeping in view the nature of the study selected and objectives to be accomplished, the quantitative approach was considered appropriate for the present study. The research design was Solomon Four Group Design. Researcher used this design to examine both the main effects of testing and interaction of testing and treatment. The study was conducted in Anglo Eastern Training Centre, Lajpat Nagar, New Delhi. The sample for the study comprised of 60 sailors doing various naval courses in Anglo Eastern Training Centre, Lajpat Nagar, New Delhi and were selected by total Enumeration Sampling (consecutive sampling). IEC was developed for sailors regarding occupational health hazards and their prevention. The steps included were: Identification and clarification of instructional goals and objectives, Selection of learning activities to accomplish these goals and Placement of the material in proper sequence. Validation of IEC was done by 7 experts from the field of nursing and medical sciences. It was prepared by extensive review of research and non research articles. The tool developed and utilized for the data collection was structured knowledge questionnaire to assess the knowledge regarding occupational hazards and their prevention among sailors before and after administration of the IEC package. The content validity of tool was established by 11 experts from the field of nursing and medical sciences. The reliability coefficient of the tool was established using Kuder-Richardson-20, and found to be 0.80. Informed consent was taken from the study subjects. Ethical permission was sought from Institutional Ethical Committee (IEC) of Jamia Hamdard, and formal administrative permission from the Centre Head, Anglo Eastern Maritime Academy. On the basis of random assignment, the study subjects (sailors) were divided into 4 groups; Experimental group 1, control group 1, experimental group 2 and control group 2. Experimental group 1 was given pretest intervention and then posttest, control group 1 was given pretest and post test but no treatment. Experimental group 2 was given only treatment and then post test was taken, control group 2 was given neither pretest nor intervention only post test was taken. The time taken for post test was 30 minutes. The data was analyzed using both descriptive and inferential statistics [1-7].

## Results

The results are divided into following sections:

**Section 1:** Demographic Characteristics of Sailors: Frequency and percentage were obtained of the demographic characteristics of sailors Figures 1-3).



**Figure 1:** Bar diagram showing the Percentage Distribution of the Demographic Characteristics of Sailors.

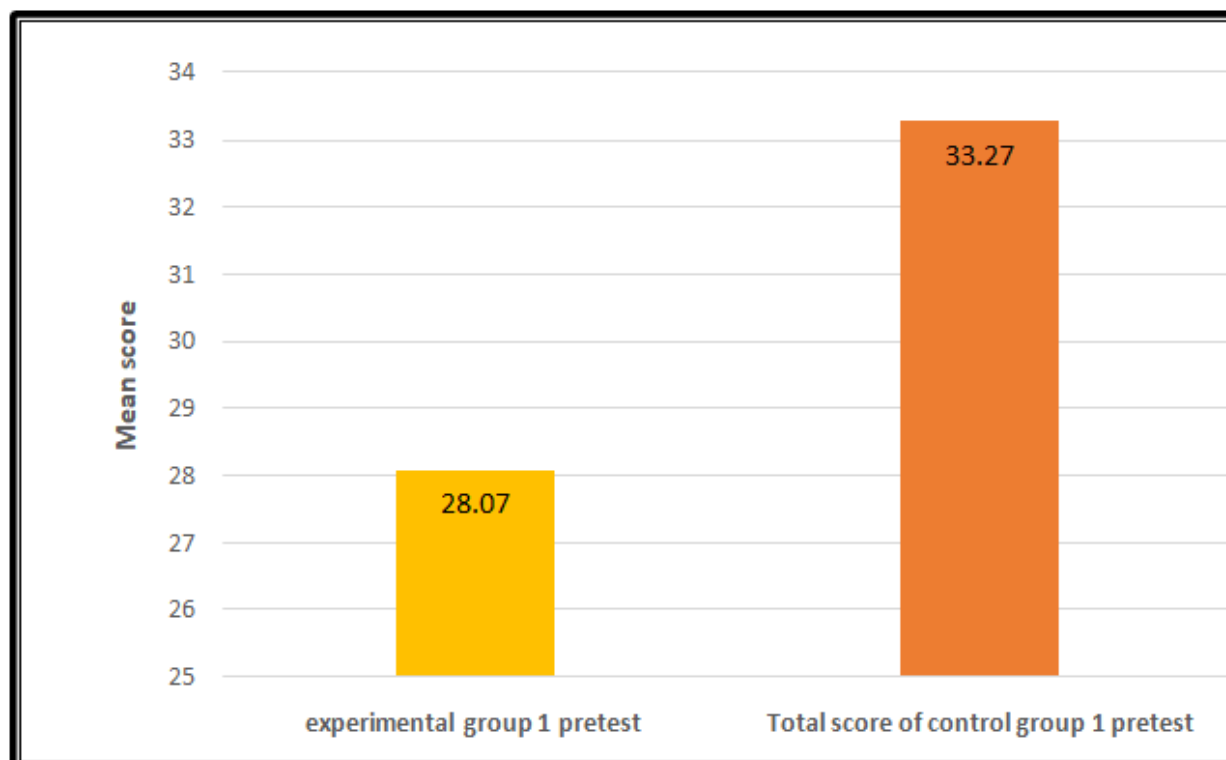
### Section 2: Frequency and Percentage of Knowledge Scores of Experimental and Control Group

Frequency and percentage of the knowledge scores regarding occupational health hazards and its prevention were computed in the experimental and control group, (Table 1).

Category	Pretest scores		Post test scores	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Experimental Group 1				
Very good	0	0	12	80
Good	9	60	3	20
Average	6	40	0	0

Poor	0	0	0	0
Experimental Group 2				
Very good			2	13.3
Good			12	80
Average			1	6.6
Poor			0	0
Control Group 1				
Very good	0	0	0	0
Good	14	93.3	3	20
Average	1	6.6	12	80
Poor	0	0	0	0
Control Group 2				
Very good			2	13.3
Good			12	80
Average			1	6.6
Poor			0	0

**Table 1:** Frequency and Percentage of Knowledge Scores of Experimental and Control Group where N = 60.



**Figure 2:** Bar Diagram showing the Mean Score of the Experimental Group 1 pretest and control group 1 pretest.

**Section 3:** Mean, Standard Error Mean, Standard Deviation and Paired 't' Test Values of Total Knowledge Scores

Mean, Standard Error Mean, Standard Deviation was calculated. In order to assess the difference in the mean knowledge score between experimental and control group, paired 't' was used, (Tables 2 and 3).

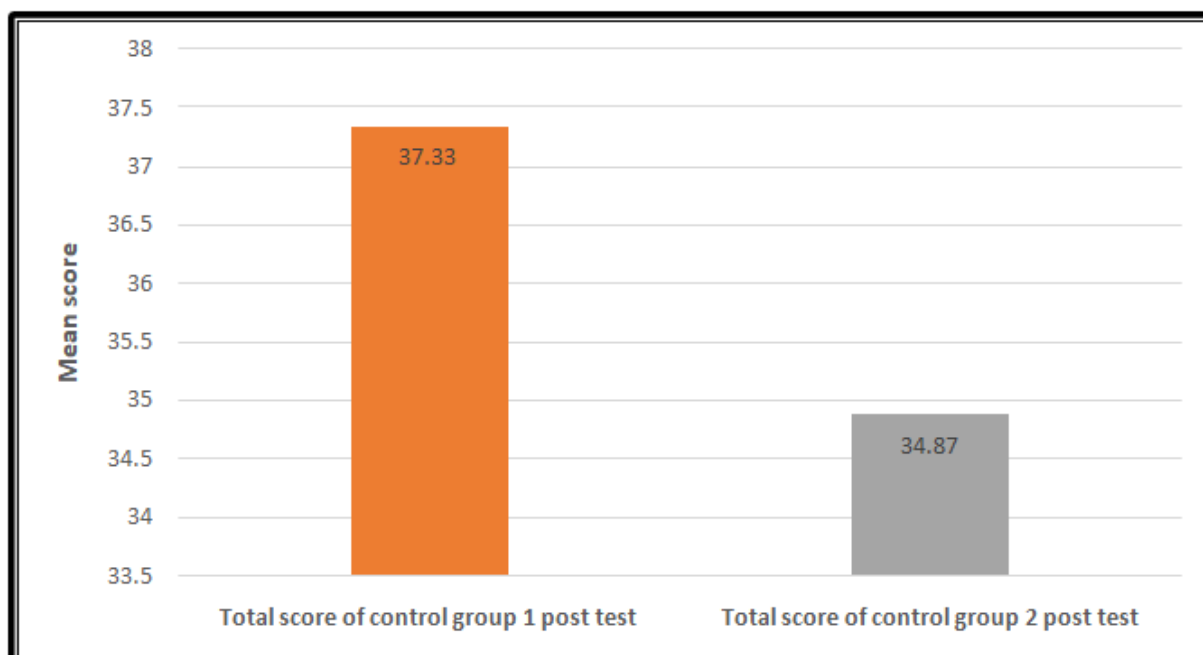
Practice test	Mean	n	Standard deviation	Mean difference	Standard error mean	t value	Df	p value
Experimental Group 1 Post Test	42.13	15	2.800	8.800	0.723	6.091*	28	.000
Experimental Group 2 Post Test	33.33	15	5.136		1.326			

**Table 2:** Mean, Standard Error Mean, Standard Deviation and Paired't' Test Values of Total Knowledge Scores of Experimental Group 1 Post Test and Experimental Group 2 Post Test.

n=30

\*significant at 0.05 level of significance

From the above paired t-test, we find that there was a significant difference between experimental group 1 post-test and experimental group 1 post-test score of the sailors as the p-value is less than 0.05.



**Figure 3:** Bar Diagram showing the Mean Score of the Control Group 1 Post Test and Control Group 2 Post Test.

Practice test	Mean	n	Standard deviation	Standard Error mean	Mean difference	t value	Df	P value
Experimental Group 1 and Experimental Group 2 post test	105.53	30	10.993	2.838	33.33	25.135*	58	.000
Control Group 1 and Control Group 2 post test	72.20	30	9.237	2.385				

**Table 3:** Mean, Standard Error Mean, Standard Deviation and Paired't' Test Values of Total Knowledge Scores of Experimental Group 1 and Experimental Group 2 Post Test and Control Group 1 and Control Group 2 Post Test.

n=60

\*significant at 0.05 level of significance

From the above paired t-test, we find that there is a significant difference between the total score of experimental group 1 and experimental group 2 post-test score and control group 1 score and control group 2 total post-test score of respondent because the p value is less than 0.05. Hence the null hypothesis H01 is rejected and alternative hypothesis H1 is accepted, that there will be a rise in the

mean post test knowledge scores of sailors after the administration of IEC package on occupational health hazards and their prevention.

**Section 4:** Association of Post Test Knowledge Scores of the Experimental Group and Control Group with the Demographic Variables

In order to assess the association of post test knowledge scores of the experimental and control group with the demographic variables, chi – square test was used, (Tables 4 and 5).

S.No	Items	Knowledge score			p-value
		Very good	Good	Average	
1	Age	7	7	1	1.00 NS
	20-25 years	5	5	0	
	26-30 years	2	3	0	
	31-35 years	0	0	0	
	36-40 years				
2	Religion	6	3	1	0.769 NS
	Hindu	4	5	0	
	Muslim	2	4	0	
	Christian	2	3	0	
	Sikh				
3	Marital status	6	8	0	0.848 NS
	Married	8	7	1	
	Unmarried				
4	Occupation onboard	6	4	0	0.095NS
	Ship engineers	0	5	0	
	Galley crew	8	6	1	
	Navigating officer				
5	Experience on ship	14	15	0	0.03*
	6 months-2 years	0	0	0	
	3 years-5 years	0	0	1	
	5 years and beyond				
6	Medical history	0	1	1	0.06 NS
	Other	14	14	0	
	No history				
7	Occupational hazards in past	14	15	1	1.00 NS
	No	0	0	0	
	Yes				

**Table 4:** Association of Knowledge Scores of Post Test Scores of Experimental Group with the Demographic Variables.

n=30

\*=significant at 0.05 level, NS= not significant

S.No	Items	Knowledge score			p-value
		Very good	Good	Average	
1	Age	2	7	5	0.977 NS
	20-25 years	0	4	3	
	26-30 years	0	2	2	

	31-35 years 36-40 years	0	2	3	
2	Religion Hindu Muslim Christian Sikh	2 0 0 0	5 0 5 5	2 10 1 0	<0.001*
3	Marital status Married Unmarried	0 2	14 1	7 6	0.005*
4	Occupation onboard Ship engineers Galley crew Navigating officer	0 0 2	5 6 4	0 12 1	0.002*
5	Experience on ship 6 months-2 years 3 years-5 years 5 years and beyond	2 0 0	2 9 6	6 5 2	0.065 NS
6	Medical history Other No history	0 2	0 15	7 6	0.001*
7	Occupational hazards in past No Yes	2 0	15 0	13 0	1.00 NS

**Table 5:** Association of Knowledge Scores of Post Test Scores of Control Group with the Demographic Variables.

n=30

\*=significant at 0.05 level, NS=not significant.

The data presented in Table 5 shows that, the computed p value of age by chi square was 0.977 which was not significant at 0.05 level of significance, the religion p value was < 0.0013, which was significant at 0.05 level of significance, the p value for marital status was 0.005 which was also significant, the p value for occupational onboard was 0.002 which was significant, the p value for experience which was 0.001 significant and p value for occupational hazard in past was 1.00 which was not significant.

## Discussion

The findings of the study were similar to a study conducted by Sehgal 10 et al.(2010) who conducted an experimental research to determine the impact of Information, Education and Communication (IEC) amongst adolescent girls in the age group of 13-19 years in the Mandi district of Himachal Pradesh (HP). Data were analyzed using an inferential analysis. The research revealed that adolescents lack complete knowledge and awareness on vital life processes and several aspects of reproductive health. The knowledge increased after the IEC package. Adolescent girls strongly desire uninhibited information which would extricate their fears and apprehensions, as the impact of IEC in the present study also increased the post test knowledge scores of sailors.

The findings of the present study were also similar to the study conducted by Khin11, 2005 with the aim of reducing acute respiratory infection (ARI) is under - five children through the use of information, education and communication (IEC) materials focusing on indoor air pollution, and to assess the impact of intervention. Sample consisted of 669 under-five children. A total of 311 in intervention and 338 in control areas were recruited for the study. Baseline data on the incidence of ARI; knowledge and attitude of mothers and practices enhancing indoor air pollution were recorded in both areas. The IEC materials were developed and distributed in an intervention area. Three months after the intervention, the study populations were followed once a month for 6 consecutive months. At post intervention assessment ARI incidence was lower in the intervention area. Maternal knowledge on cause of ARI and attitude towards indoor air pollution and ill health were significantly improved in the intervention area but not the change in practice. Study recommends that further studies with the use of IEC materials coupled with other behavioral impact approaches may enhance the change in practice and reduction of ARI incidence [8-11].

## Conclusion

The IEC package developed on the occupational health hazards and their prevention among sailors lead to increase in the post test knowledge scores of sailors as compared to the pretest knowledge scores as found out during this study. The subjects found the IEC

Package effective on increasing their knowledge regarding occupational health hazards and their prevention.

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## Conflict of Interest

None

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