

A STUDY ON THE FACTORS INFLUENCING THE SEAFARERS' STRESS

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Abstract

The study examines the factors that are influencing the seafarers' occupational stress based on the occupational stress indicators. The study investigates the work-related stress factors, physical stress factors and psychosocial stress factors in the process of assessing the stress levels of the seafarers who work on-board the ships. The occupational stress has been documented as one of the most important workplace health hazards for employees in developed and developing countries (Paul E. Spector, 2002^[18]; Danna & Griffin, 2002^[8]). Stress or Stressor refers to any environmental, social, or internal demand which requires the individual to readjust his/her usual behaviour patterns (Holmes & Rahe, 1967)^[10]. Stress rarely has a single source point, rather stress has been found to have many different sources. Stress can be caused by acute or chronic physical stressors, or by psychological and social stressors (Sapolsky, 1994)^[19]. The majority of stressors tend to be those associated with psychological and social issues that are related to both personal and work lives. The study had analysed the work-related stress using student's t-test and also had classified the stressors into five manageable factors by using Factor analysis. The stresses incurred by the seafarers were then compared by testing the hypotheses by using one way ANOVA.

Keywords: Stressors, Psychosocial stressors, Physical stressors, Work-related stressors.

Introduction

Stress is inevitable in today's complex life since right from the time of birth till death an individual is invariably exposed to various stressful situations. The threat of political and economic imbalances and uncertainties, unemployment, poverty, urbanisation and increased socio-economic complexities and innumerable other factors contribute to Stress (Aziz, 2004)^[3].

Stress is an important psychological concept that can affect health, well-being and job performance in negative dimensions, (Mojoyinola, 1984^[16]; and Olaleye, 2002^[17]). It is regarded as a force that pushes a physical or psychological factor beyond its range of stability, producing a strain within the individual.

Stress is the process by which environmental events (stressors or challenges) threaten us,

how these threats are interpreted, and how they make us feel (Baum et al, 1997)^[4].

Lazarus (1966)^[15], conceived stress to be a threat of anticipation of future harm, either physical or psychological events that lower an individual self-esteem. It is an affective behaviour and physical response to aversive stimuli in the environment.

According to Selye (1976)^[20], stress is a state within the organism characterized by general adaptation syndrome. In other words, it is the nonspecific response of the body to the demand made upon it.

Stress may be acute or chronic in nature. It exists in different forms. It may be psychological, emotional, social, occupational or job related. Stress experienced by workers at work is called job stress. It may be due to a number of factors such as poor working

condition, excessive work load, shift work, long hours of work, role ambiguity, role conflicts, poor relationships, with the boss, colleagues or subordinate officers, risk and danger, to mention a few. Certain responses indicate the presence of job stress in an individual, or group. It may manifest by the presence of headache, sleep disturbances, difficulty in concentration, short temper, upset stomach, job dissatisfaction and low morale.

Cartwright and Cooper (1997)^[5] further pointed out that in the short term, stress can lead the employees to stomach disorder, headaches, sleeplessness, emotional distress and loss of energy/motivation, and in the long term, it can give to serious illness and even early death, most likely due to cardiovascular disease (heart diseases).

There are a number of workplace factors, called job stressors that make jobs stressful and difficult for number of employees in services as well as manufacturing industries. Additional stressors concern interpersonal relationships at work, such as conflicts with the behaviour of supervisors, conflicts with colleagues, conflicts with subordinates and conflicts with management policies (Paul Spector, 2002)^[18]. Kahn and Byosiere, (1992)^[13] and Taylor, (1999)^[22] further pointed out that there are some other stressors in the organizational context, such as having insufficient resources to do the job (e.g., defective equipment or inadequate supplies), or low salaries structure. Research has clearly demonstrated that all of these job stressors are connected with employees' health and well-being.

As is characteristically found in various studies, higher levels of stressors (e.g., heavy workload and uncertainty about supervisors' expectations) were associated with physical symptoms, such as headaches, and poor job attitudes.

Job-related psychosocial stressors are often attributable to high job demands, shift work, external work controls and the limited scope for decision-making. The effort-reward model is increasingly used to assess job-related stress, mainly with regard to cardio-vascular diseases. Seafaring is associated with special mental, psychosocial and physical stressors and cannot be compared with jobs ashore. The working and living conditions in seafaring are characterized by long-time separation from family and home for months, growing economic pressure as well as considerable and partly extreme psychosocial problems.

Crimmins and Hayward^[6] observed that work disability was associated with stressful jobs, lack of job control, and environment hazards for humans. Seamen are often faced with time-pressure and hectic activity during their voyage. The likely stress level depends on the rank and the job tasks on board. It is assumed that officers have to endure high stress due to their comprehensive responsibilities for personnel and material.

Watch-keeping and acute operational failures require increased activities with long and irregular working hours. The International Labour Organization (ILO, 2006)^[11] determined the maximum working times of seafarers to be 14 hours per day. In seafaring, this time span is often considerably exceeded, especially on ships with frequent port clearances.

The working conditions on board cargo or passenger ships are different. The crew of cargo ships consists of about 10 to 20 seafarers. These crews have a physically stressful job, especially on container ships (i.e. lashing of containers in a storm).

Additionally, seafarers on cargo ships or tankers are possibly exposed to dangerous goods (i.e. toxic gases and fumes, explosive substances, chemicals). On passenger liners the physical

stress is less when compared with the stress on cargo ships.

Besides the type of ships, their size also influences the working situation: the stress increases in smaller vessels, with more reduced crews, shorter stays at ports and through insufficient recreation.

On the other hand, large container ships operating worldwide are regarded as stressful due to monotony and isolation during long-term voyage. Systematic investigations of the seafarers stress have as yet scarcely been performed.

Objectives

The objectives of the study were to analyze the factors (stressors) influencing the seafarers stress:

- To investigate the mean differences of the work-related stressors through the student's t-test.
- To examine the physical & psychosocial stressors of the seafarers through Factor analysis and ANOVA.

In order to achieve the objectives, this article is organized around the following working hypotheses:

- H_1 : There is a significant difference in the mean values of individual work-related stress factors of seafarers.
- H_2 : There is a significant difference in the mean values of the physical & Psychosocial stressors of the seafarers.

Methodology

The target population was considered as seafarers of Indian origin who were working at

various levels/job categories on the deck side and the engine side of foreign going merchant vessels. The total sample size considered for the study was 385.

The study consists of two parts. In the first part of the study, the work-related stressors of the seafarers such as Mental strain of accomplishing the set-task, Lack of rewards for accomplishment, Lack of self-confidence to work, Social relations, Feeling of threat, Physical oppressiveness, Unpleasant work conditions, Lack of support & Sense of responsibility, were measured on a five-point scale from 1 (strongly disagree) to 5 (strongly agree). The questionnaire designed for the evaluation of subjective perception of work and the individual feeling of work-related stress, allows the individual estimation of the feeling of stress.

In the second part of the study, the survey elicited the demographic and job-related data, usual shipping routes, shipboard working hours, type and size of the ships and average number of crew members on board. To assess the stress due to long continuous working days, the occurrence of extremely long working times was registered. Furthermore, the most stressful job activities such as watch-keeping at sea (officer on watch on the bridge), district route of a seagoing vessel (navigation through highly frequented routes), port clearance (loading and unloading, safety techniques and hygiene control measures), port manoeuvres (arrival and departure), administrative tasks, and routine activities during the voyage.

To assess the stress load, the seafarers were asked to respond based on a scale from 1 (very weak) to 5 (very strong), the individual relevance of each factor was recorded to determine the respective stress level. By means of a subsequent factor analysis, the loading of each stressor to the above mentioned stress categories were explored.

The questionnaire which included both the parts of the study was administered to 550 seafarer respondents and the completed responses were obtained from 416 respondents, of which 385 respondents were considered for further study after scrutiny.

Measure of Seafarers' Stress

In the first part of the study, it is evident from Table-1 that the cronbach's^[7] alpha values are reasonably high and hence it can be inferred that the scales are consistent and reliable.

Table 1: Cronbach's Alpha Values

Factors	Cronbach's Alpha
Mental strain of accomplishing the set-task	0.72
Lack of rewards for accomplishment	0.71
Lack of self-confidence to work	0.78
Social relations	0.71
Feeling of threat	0.73
Physical oppressiveness	0.82
Unpleasant work conditions	0.81
Lack of support	0.77
Sense of responsibility	0.81

The result of the Questionnaire survey regarding the work-related stress of the seafarers shows that the p-values of all the stress factors (stressors) are less than 0.05 (Refer Table-2). This clearly indicates that the seafarers, irrespective of the deck-side seafarers or the engine-side seafarers, have a sort of mental strain while accomplishing their tasks and they are also incurred to the high levels of physical oppressiveness.

In addition, the seafarers have strong feeling towards the factors such as lack of rewards for

accomplishment, lack of self-confidence to work, feeling of threat, unpleasant working conditions and the lack of support from their peers or superiors. The stress level on ships travelling worldwide was considered higher due to the separation from their family. This is probably caused by the long distance from home as well as by missing social contacts due to the fact that these ships only stop a few times in ports.

In spite of the levels of stress incurred by the seafarers on-board, the seafarers with long period of service at sea subjectively estimated their work as less burdening and stressing as compared to the new entrants.

The seafarers were aware of their own abilities of meeting job requirements, the seafarers work experience at sea reduced uncertainty while solving problems, the seafarers were aware of the safety and health related rules of work on vessels, the seafarers had gained and consolidated theoretical and practical knowledge and skills of coping with difficult situations.

Table 2: Significance of mean values of individual stress factors examined by Student's t-test (significance level = 0.05)

Stress factors	t	p
Mental strain of accomplishing the set-task	2.04	0.015
Lack of rewards for accomplishment	2.05	0.012
Lack of self-confidence to work	2.02	0.019
Social relations	1.94	0.009
Feeling of threat	1.98	0.019
Physical oppressiveness	2.02	0.022
Unpleasant work conditions	2.04	0.016
Lack of support	2.06	0.014
Sense of responsibility	2.02	0.023

Factor Analysis

In the second part of the study, the individual stress load of 22 known seafaring stressors was asked. Table-3 shows the factor loadings of principle component analysis through varimax rotation. The analysis was developed in three steps. First, an exploratory analysis using a correlation matrix for all of the 22 variables was computed. In the second step, a principal component method was used to extract the factors. A rotation varimax (orthogonal) was conducted to make the factors more interpretable. Factors loading values were considered indicators of significant factorial contribution. The extracted factors are Physical stressors, Psychosocial stressors, Social stressors, High work demand, High management tasks.

The physical stressors comprised six attributes: heat in workplaces, noise, ship movement / sea sickness, hard physical work / lifting and carrying, lack of exercise, and climatic changes during the voyage.

The psychosocial stress was summarized in four stress categories: shift, long working days, irregular working hours, lack of sleep.

The social stressors due to migration were classified as separation from their family, long stay on board, conflicts between crew members, isolation.

The high work demand factors were classified as time pressure / hectic activities, high volume of work, high responsibility for their own activities, pressure due to decision-making, monotony, lack of independence.

The high management tasks comprised of insufficient qualification of subordinate crew members & high responsibility for the work of other crew members.

TABLE 3—Factor Analysis of the Stressors (Varimax Rotation)	
Factor-1: Physical stressors	
Heat in workplaces	.91
Noise	.93
Ship movement, sea sickness	.82
Hard physical work, lifting, carrying	.84
Lack of exercise	.71
Climatic changes during the voyage	.73
Factor-2: Psychosocial stressors	
Shift	.88
Long working times per day	.84
Irregular working times	.79
Lack of sleep	.75
Factor-3: Social stressors	
Separation from the family	.81
Long stay on board	.74
Conflicts between crew members	.72
Isolation	.78
Factor-4: High work demand	
Time pressure, hectic activities	.89
High volume of work	.86
High responsibility for the own activities	.78
Pressure due to decision-making	.72
Monotony	.79
Lack of independence	.69
Factor-5: High management tasks	
Insufficient qualification of subordinate crew members	.79
High responsibility for the work of other crew members	.71

The scales of the factors such as physical stressors, psychosocial stressors, social stressors, high work demand & high management tasks have good internal consistency & reliability with the Cronbachs^[7] Alpha values of 0.93, 0.86, 0.89, 0.78 and 0.81 respectively.

TABLE 4—One way ANOVA of the factors of Stress

Stressors	F-ratio	p
Physical stressors	3.021	0.018
Psychosocial stressors	3.014	0.026
Social stressors	2.129	0.015
High work demand	3.189	0.001
High management tasks	3.136	0.024

One way ANOVA was conducted on the selected factors of stress. The comprehensive results of one way ANOVA are given in Table-4. It is evident that the p-values for all the stressors are less than 0.05. To study in detail, the stressors are considered individually:

The Physical stressors such as heat in workplaces, noise, ship movement, sea sickness, hard physical work, lifting, carrying, lack of exercise and climatic changes during the voyage are considered as the most vital factors in influencing the seafarers stress when they are on-board.

The Psychosocial stressors such as irregular shift, long working times per day, irregular working times & the lack of sleep would actually put the seafarers in great stress. The psychosocial stressors of the seafarers may even lead to accidents.

The Social stressors / problems due to migration such as separation from the family, long stay on board, conflicts between crew members &

isolation will enable the seafarers to completely delink from the social life.

The High work demand such as time pressure, hectic activities, high volume of work, high responsibility for the own activities, pressure due to decision-making, monotony & lack of independence are considered as the most important factors of stress.

The High management tasks such as insufficient qualification of subordinate crew members & high responsibility for the work of other crew members will affect the morale of the seafarers.

Conclusion

This study reveals that the long working days, heat in work places, separation from their family, time pressure/ hectic activities, and insufficient qualifications of subordinate crew members are the most important stressors on board. The seafarers with higher stress due to heat in shipboard operations had shorter job duration at sea. The stressors of heat and noise show that physical stressors on ships currently are still very important in spite of the increasing mechanization in seafaring.

In the study, the separation from the family is regarded as a further important stressor on ships. The associations between professional group and shipboard stressors were not significant except for heat in workplaces. Especially the engine room personnel, permanently being close to the heat-producing engines, stated a higher stress level due to heat in their workplaces.

Additionally, the time pressure aboard was regarded as more stressful by less-than one third of the engine personnel, but by half of the deck-side seafarers. A higher stress level due to insufficient qualification of subordinate crew members was slightly more frequently complained about by deck than by engine room

seafarers. The stressor separation from their family also depended on the age of the seafarer and was more predominant in younger seafarers, particularly when having children.

The deck-side officers stated a higher stress level due to time pressure and hectic activities on board. This can be attributed to their frequently extremely long working days due to unexpected situations and to the increasing amount of administrative duties.

Extremely high number of working hours over a lengthier period of time combined with a lack of sleep can elicit chronic fatigue, health problems and safety risks on the vessels.

The study showed that engine room seafarers had a lower stress level than deck side seafarers due to long working days and time pressure or hectic activities. This indicates regular working hours and routine procedures in the engine room, whereas especially the deck personnel has to react to permanently changing job demands such as port clearance, district routes and watch-keeping at sea.

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