

**WORK-RELATED STRESS AT SEA
SELF ESTIMATION
BY MARITIME STUDENTS AND OFFICERS**

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ABSTRACT

People working at sea experience stress connected with their specific work conditions, high job responsibility and psychosocial factors, which generate health and psychological problems.

The self- evaluation of mental strain related to the work at sea was arranged for Maritime Academy students and for merchant marine officers.

Two study groups were examined: 30 students of the Mechanical Faculty of the Maritime Academy (MA) in Gdynia, of the mean age 22,7 years, and 30 seamen, i.e.

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deck officers and ship's engineers, of the mean age 47,2 years, with a minimum 15-year period of service at sea.

For the assessment of work-related stress level, the „Work-Related Stress – Subjective Work Evaluation Questionnaire” was used.

Comparing to the officers with a long period of service at sea, the students were more vulnerable to stress at work, and this was attributed to: social relations, physical onerousness, the lack of control, and the lack of support.

The programme of psychological training, aimed at supporting the personal competence, was proposed as a preventive intervention.

OBJECTIVE

The objective of the study was the comparison of the self-evaluation of the work related stress in students of the Maritime Academy and in experienced merchant marine officers.

INTRODUCTION

The occupational activity accounts for about 25% of stress in adult life [1,4,12]. The work-related stress among seafarers is strongly connected to specific physical and psychosocial conditions of work on ships.

The attention devoted to this stress has markedly increased recently because of the following reasons:

- it is acknowledged as epidemiological phenomenon
- it is connected with negative attitudes and behaviour of workers
- the negative consequences of this stress are extremely expensive for the shipping industry [13,21]

According to data available, almost one half of workers regard their work environment as a source of stress factors, subjective and objective [21]. The objective ones belong not only to the physical, biological and chemical work conditions but also to the specific social and organizational factors: the employee's level of income, chances of promotion and relations with co-workers. The subjective ones are related to assessment of situation, attitude to ones duties or job satisfaction [15].

Another large group of factors affecting health and behaviour via stress mechanism also play a role [6,7,11,20]. The so-called psychosocial factors developing their potentially harmful effect depend on individual psychological assessment of the events

or their predictions [5,6].

The most frequently considered psychosocial stressors at work at sea are:

- excessive or insufficient work responsibilities; monotony, lack of stimulation or perspectives of development
- biorhythm disturbances resulting from the shift work
- related with migration: changing the environment, long separation from family, isolation.
- managerial duties: conflict situations, great responsibility for the safety of crew, difficult decisions [21].

The majority of researches indicate that being under stress results in worsening the general quality of life of a worker, his well-being, and negatively affects his health [1,5,6,11,20,22].

The most important factors which determine the work related stress are the level of requirements, degree of control of the work performed and receiving the social support.

R. Karasek [13] presented the four situations and distinguished models of stress:

- High requirements and small scope of control
- High requirements and large scope of control
- Low requirements and small scope of control
- Low requirements and large scope of control

The author pointed out that interaction of high requirements and low degree of control is particularly dangerous and highly stressogenic. High requirements and having no influence on the task performed cause a state of psychosomatic tension which leads to anxiety, depression and rises the risk of illness [13].

This is intensified by lack of social support. In contrast, the wide autonomy, lack of limits, the feeling of control over the process of work and social support lower the level of stress [2].

Frequent but moderate stress results in physiological activation and high mobilizing readiness. The prolonged stress can cause development or aggravation of somatic problems, as the ischemic heart disease, peptic ulcer, allergies, headache, back pain, and to a certain extent also malignant neoplasm and lowering of immunity [8,9].

The selected health effects may be classified as follows:

- Immediate effects
 - i.e.: rise of blood tension, cardiac rhythm disorders, muscle tension, sweating, acute peptic ulcer or bleeding from the gastro-intestinal tract
- Delayed effects
 - mental: burnout syndrome, depression, learned helplessness,

- behavioral disturbances: alcohol and nicotine abuse, pharmacomania, aggression, changes in dietary preferences, sleep disorders,
- psychiatric: changes of defense mechanisms and personality.

The intensity of stress may be described on different levels and modified. It may be lowered by certain features of temperament and personality, by adequate knowledge, job skills and support given by superiors or co-workers.

People belonging to the so-called risk groups are vulnerable to work related stress, their ability of meeting job requirements are low, the influencing factors may be the following:

- young or advanced age
- short work experience
- the workers abilities, profession or job experience are unsuitable for work done
- a type of behaviour: striving for achievements, high level of aspirations, need of control, impatience, haste and rivalry
- having problems not connected with work – divorce, illnesses in family.

This applies also to certain groups of seafarers and maritime students [3,18].

The world merchant fleet constantly being modernized and automated, creates high requirements set for the present-day seamen, in particular as regards to their psychological condition [10,14,16,17,18,19]. Among most demanding factors probably on the first place is the feeling of isolation while working on a ship and the lack of normal family life [16,17,18].

Other factors may include [3,4]:

- living and working for long periods of time with a randomly selected small group of other crew members – always the same group of people crowded in a restricted space of a ship
- progressively shorter stays in ports, and lack of recreation,
- adverse weather conditions, risk of drowning, terrorism attack etc.,
- casual sexual contacts in ports, involving risks of infections, including HIV.

All the stressors named above, together with lowered resistance to stress and inability to manage it may cause physiological and mental disturbances.

MATERIAL AND METHODS

Two groups of subjects were examined:

- 30 fourth-year students of the Mechanical Faculty of the Maritime Academy in Gdynia, their mean age was 22,7 years, with limited seafaring experience (participation in a 3 months training cruise on a merchant ship), and

- 30 seamen: deck officers and ship engineers, their mean age was 47, 2 years, with a minimum 15-year period of service at sea.

For the self - assessment of work-related stress level „Work-Related Stress – Subjective. Work Evaluation Questionnaire” was used in both groups [5,6].

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, as well as distinguishing factors regarded as particularly oppressive and stressogenic [5,6]. The test form contained 55 questions. Ten factors defined the conditions of work:

1. Mental strain related to the complexity of work
2. Lack of rewards for service
3. Lack of self-confidence related to the organization of work
4. Social relations
5. Feeling of threat
6. Physical onerousness
7. Unpleasant work conditions
8. Lack of control
9. Lack of support
10. Sense of responsibility

The survey was carried out between January and November 2005.

The statistical module of MS Excel 2003 was used for calculations.

RESULTS

The following test results were obtained for 10 stress factors in both study groups; mean values and standard deviations are given in Table 1.

Table 1. Self estimation of work related stress by students (N=30) and ship officers (N=30).

Mean values and standard deviations indicated for the two groups.

Stress factors	Students		Officers	
	Mean	Deviation	Mean	Deviation
1. Mental strain due to the complexity of work	19.9	5.3	17.8	3.5
2. Lack of rewards for service	17.1	5.5	17.0	6.1
3. Lack of self-confidence related to organiz. of work	17.3	3.8	16.2	3.7
4. Social relations	10.5	2.6	9.0	2.4
5. Feeling of threat	12.7	2.7	11.3	4.9
6. Physical onerousness	10.6	2.6	8.4	3.6
7. Unpleasant work conditions	7.7	3.0	6.9	6.4
8. Lack of control	9.0	2.3	7.7	1.9
9. Lack of support	6.2	2.2	5.4	1.5
10. Sense of responsibility	9.3	2.8	8.4	2.1
Global stress result	120,3 – 8 sten		108,1 – 7 sten	

In general, in all 10 scales of the Subjective Work Evaluation Questionnaire students were in a higher degree burdened, as compared to officers. The total stress reached the level of 8 sten, indicating that students regarded their future occupation as highly stressogenic, already at the beginning of their work at sea.

Officers also recognize their work at sea as highly burdening, except in the „lack of control” aspect, when they assessed their work as less burdening than other occupations on land. This means that they achieved certain freedom in organizing and performing their work. The total officers' stress assessment result reached 7 sten, also indicating strong feeling of stress during their work on ships.

In the next step, differences between mean values were calculated for individual stress factors what is shown in Table 2.

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

Stress factors	Mean values		Variances		t	Boundary t value
	Students	Officers	Students	Officers		
1. Mental strain due to the complexity of work	19.9	17.8	28.5	12.4	-1.922	2.045
2. Lack of rewards for service	17.1	17.0	30.5	37.1	-0.028	2.045
3. Lack of self-confidence related to organization of work	17.3	16.2	14.2	13.4	-1.111	2.045
4. Social relations	10.5	9.0	6.8	5.6	-2.137	2.045
5. Feeling of threat	12.7	11.3	7.1	23.9	-1.398	2.045
6. Physical onerousness	10.6	8.4	7.0	13.1	-2.800	2.045
7. Unpleasant work conditions	7.7	6.9	8.7	41.1	-0.724	2.045
8. Lack of control	9.0	7.7	5.1	3.5	-2.635	2.045
9. Lack of support	6.2	5.4	4.9	2.4	-2.188	2.045
10. Sense of responsibility	9.3	8.4	7.9	4.5	-1.398	2.045

As compared with officers, students were, according to their subjective estimation, more burdened by the following work-related stress factors: social relations, physical onerousness, lack of control, lack of support.

DISCUSSION

The Maritime Academy students regard their future profession as highly burdening and stressing already at the beginning of their career. They anticipate that being a seaman requires: the necessity to collaborate with others, to perform complex mental tasks, to support co-workers. They also feel that it involves elements of competition and problems related to interpersonal conflicts, and expect that their work will have to be performed under hard psychophysical conditions.

In their opinion, the work at sea is based on the repetition of the same activities, under strict time discipline and continuous vigilance.

The MA students are afraid that their colleagues will not support them and that they would have problems at work due to the lack of collaboration.

The general result of the Questionnaire survey shows that students, compared to officers who had long period of service at sea, are more vulnerable to work-related stress because they:

- belong to a risk group of young men, with no maritime experience, characterized by low ability to cope with job requirements,
- are afraid of new situations and have doubts whether their knowledge and skills will be satisfactory when they will be faced with real problems at sea,
- have no sufficient knowledge of the range and kind of threat they may face while working at sea.

The merchant marine officers with long period of service at sea subjectively estimated their work as less burdening and stressing, comparing to MA students. Their assessment showed that:

- they were aware of their own abilities of meeting job requirements,
- their general and work experience at sea reduced uncertainty while solving problems,
- they knew better the safety and health rules of work on ships,
- they gained and consolidated theoretical and practical knowledge and skills of coping with difficult situations.

They were better prepared for the work at sea. [10].

CONCLUSIONS

- MA students preparing themselves for work at sea anticipate it - objectively and subjectively - as a highly stressing job comparing to the group of merchant marine officers.
- Their first experience during the training period on merchant ships confirms them in this conviction.
- Only longer experience of work at sea can partly change their opinion.
- The training in psychological skills is suggested for MA students, as well as for ship officers.
- Especially profitable are psychological sensitizing trainings, aimed at developing interpersonal competence; in particular to the capacity of solving interpersonal conflicts on board, as well as providing and receiving support.

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