

Research Article

# Psychological studies of stress experienced by seamen during a long-distance sea voyage<sup>#</sup>

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<sup>#</sup>This article summarized the analyses presented by author in his book: *Stres w izolacji morskiej: Psychospołeczne uwarunkowania* [Stress in Sea Isolation: Psychosocial Predictors]. University of Gdańsk Press, Gdańsk, 1966, 2005.

## Abstract

The issues investigated in the current study pertain to selected psychological aspects of human functioning in long-term stress conditions. Results of the analyses performed in this study have submitted evidence to confirm the hypothesis in which it is stated that staying on the sea for a long time is a difficult situation which contributes - to a greater or smaller extent - to starting the stress process in sailors. The role of *interpersonal competencies* that has been found most distinct; high level of this variable contributed to reducing both anxiety and the feeling of loneliness. It has been evidenced in the research that the skill of good functioning in varied social groups, which results from high level of development of several traits including: openness, spontaneity, responsibility, and sensitivity, becomes particularly important in long-term difficult situations in which there is little possibility of eliminating the real menace.

Another conclusion to be inferred from the research is the one confirming the theoretical suggestion in which the importance of *'ego strength'* in modifying the course of stress process is emphasised. This personality dimension has turned out to constitute the factor capable of protecting an individual against increase in both anxiety states and the feeling of loneliness during sea isolation.

Another issue considered in the current study pertains to defining the role of 'family variable' in mediating the course of stress process under conditions of long-term task isolation. The analyses have confirmed the hypothesis in which it was assumed that sailors functioning in family systems characterised by high level of integration and quality, experience lower emotional costs during a voyage. Generally, it may be claimed that - according to the research results of the study - 'family variables' may constitute a significant predictor of both the 'quality' of a man's functioning and personal costs he experiences in long-term stress conditions.

Stressors are a pervasive phenomenon in every man's life. For this reason, we could state that everyone has to deal with them from the day we are born, although with various intensity and frequency. Throughout the last three decades, we have observed an intensively increasing number of studies dedicated to stress itself as well as inevitably intertwined with it: individual well-being, health and efficiency of functioning in different areas of human life. Both empirical analyses and theoretical reflections clearly indicate that there is a strong connection between generally defined quality of human life and a visible rise in death rate in result of stress experienced.

One can more and more vividly notice the postulated relation of pure knowledge in tackling the problem of stress, somatic or psychosomatic inclination to stress with recent life experience of an individual, his/her psychological "resources" and a social environment of his/her functioning.

## More Information

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Submitted: 08 August 2020

Approved: 24 August 2020

Published: 25 August 2020

How to cite this article: Plopa M. Psychological studies of stress experienced by seamen during a long-distance sea voyage<sup>#</sup>. *Insights Depress Anxiety*. 2020; 4: 049-054.

DOI: 10.29328/journal.ida.1001019

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The subject matter of stress integrates the scientific work of experts in medicine, psychology, sociology and even philosophy. They all aim at understanding this pervasive phenomenon, mechanisms of its creation and development, but first and foremost they aim at obtaining knowledge on handling stress in different stages of life and in various conditions.

In a modern, fast pace, industrialized and urbanized society, there are individuals or groups of people, who are extremely exposed to strong stressors. Stress is connected with their work or professional mission with consequences of stress negatively (although not always assigned) experienced by themselves as well as by their families. Psychological work related risks could be connected with both the difficult conditions and "the separation stress" that stems from being far away from one's family members. There are more



and more professions, traditional as well as modern ones, which inextricably demand long absence from the basic developmental environment. Amongst them, there are geologists, diplomats, army experts, commercial agents, pilots. It is beyond question that “the men of the sea” – seamen or fishermen, who because of their difficult work are regularly separated from their families for long periods of time, do burden their families with all negative consequences of this separation.

A modern world cannot “escape” from the problems connected with individual functioning in various situations of isolation and deprivation. It is the reason why the interest of scientists in professional groups working in isolation conditions is followed by multidimensional examination with its explanatory and pragmatic consequences. On one hand, studies conducted allow for a better insight into the stress phenomenon, mechanisms of its creation and minimization. On the other hand, those analyses allow for the implementation of certain prevention or selection policies. Nowadays, there is a great demand for knowledge connected with human behaviour in various non-standard situations. From this trend several new psychological disciplines have already taken their origin: marine psychology, polar psychology, air or cosmic psychology just to name a few. Those disciplines concentrate on working out specific, good validity predictors of optimal individual functioning in difficult conditions, and in particular, on learning the psychological mechanisms of adaptive behaviours and ways of reducing deprivation and isolation effects.

Seamen’s families certainly are amongst those social groups, which are mostly either permanently or frequently exposed to lasting stress. What is specific to “the men of the sea” is that they are constantly separated from their families. Dynamics of seamen’s families are specific due to the (husband’s, father’s) on going stay at sea, his absence from home and his arrivals. The generated separation stress causes a need for implementing various adaptive mechanisms and for applying different – in terms of efficiency – strategies of dealing with it. Practice indicates that despite “protests” of seamen, institutions hiring them ignore the problem of psychological and health costs burdening employees and their families. Short presence at home allows seamen to “regenerate” their psychological powers but, by the same token, it can make it difficult or even impossible to “reactivate” basic marital and family roles. Husbands, by delegating their power to wives, having no rudimentary knowledge about everyday problems and, consequently, a highly reduced influence on the decision processes in families, can suffer a serious blow to their self-esteem, experience a sense of alienation and, as a result, develop the mechanism of “running away to sea” – which is a developed strategy of dealing with stress. Frequent absence of seamen from home is one of the two main causes for the onset and unfolding of the stress process. Another cause is

connected with the living and working conditions at sea. A ship constitutes a specific working and living environment, different to that on land. This is because, seamen become participants of a restricted social group with paramilitary authority structure for long periods of time, being on duty and spending their leisure time on a ship. Working conditions entail particular stress generating ambience. Just to name a few disturbances: rolling, excessive noise and vibration, frequent changes of weather conditions, limited living space, a dearth of basic sources of emotional, sexual and cultural gratification, restriction of psychological freedom as well as intimacy area, and, in particular, problems or impossibility of communicating with family members.

In view of the arguments presented above, one has to ask the question about “psychological costs” borne by seamen due to their difficult profession. We can analyze both, short term and long term (distant) costs resulting from repeated periods of living in isolation. We have to underline that recent studies have not put proper emphasis on the psychological aspect of this problem. Scientists usually concentrate on problems of adaptability or work efficiency. In other words, they try to answer the question about individual, social or organizational factors enhancing efficiency, omitting the psychological costs of such work. We can deal with the situation where a seaman is functioning well in his professional role (which is confirmed by e.g. his boss’ assessment), but “pays” a high price for it in terms of personal stress (negative emotions experienced), which is beyond his superior’s interest. Former analyses, if ever dealing with this problem, very rarely concentrated on personal differences. This subject literature gives examples of studies describing general dynamics of specific psychological states (for example neuroticism, anxiety, perception of time) of people experiencing long lasting isolation, without however analysing their individual determinants. This is partly due to the small number of participants of the isolated working group. So, the question on predisposition to sustain stress in conditions of long isolation connected with work is still open. Psychological predictors of adaptability in difficult situations discovered in experimental (laboratory) isolation have low prognostic validity of predicting work efficiency, and in particular, psychological costs borne by people living in conditions of long lasting, real isolation.

All these remarks define as well as direct the subject matter of empirical analyses and theoretical reflections presented in this article. Generally speaking, the main goal of these studies, financed by Polish Academy of Sciences, was to search for an answer to the question of multidimensional (*demographic, personal, social*) factors affecting dynamics of stress processes in a long distance sea voyage. The key problem defined in such a way had to be examined in studies conducted in real isolation. The author of this presentation decided to participate in the whole voyage along with seamen, who were the participants of his studies. The undertaken



project was based on (with references to analyses of existing literature) an essential assumption that “personal costs” borne by an individual living for a long time in objectively stress generating conditions depends mainly on the subject’s personal and social (particularly connected with family) competencies. *In other words, the character of studies was determined by the thesis that a person equipped with abundant psychological resources (including personal values, personality structure, family support) is more resistant to stress stemming from the experience of long lasting, voluntary working isolation.*

Theoretical background of analyses presented here was the general concept that stress processes are a result of interactions (transactions) between an individual and a situation. The author of this article places an emphasis not on how a situation is “perceived” by a person but rather on psychological resources (the basis) determining quality of these interactions. In these terms an individual can experience “stress” showed by various “indicators” both physiological and psychological. For example, a person could perceive objectively stress generating conditions as non threatening, but may indirectly experience it on a physiological, interpersonal or intrapsychological level.

The studies presented here were conducted by the author on a group of 81 seamen working on a ship during a seven month long fishing voyage in the Falkland fishing zone. The crew consisted of 90 people including a psychologist and a doctor. However, not all of the staff agreed to take part in the studies. Moreover, it is worth emphasizing that a psychologist did not have any influence on the crew’s selection before the beginning of the voyage, it was the management of the enterprise that decided about everything. Consent of the seaman to the participate in the studies was not a factor determining their engagement in the voyage. For that reason, it was difficult to predict, before the outset or during the voyage, the number of seamen who would agree to be study subjects ready to participate to the completion of those studies. One can easily assume, considering the methods applied in organising voyages, that the crew was selected in a random manner. However, of course, members of the crew were chosen from among the “sailing” employees of PPDiR “Dalmor” in Gdynia.

Data analyses concerning the age of participants showed that the seamen were aged from 21 to 53. The best represented age group was that between 31 and 45 (53.1%), followed by those below 30 (27.1%).

As for the social origin of the participants, the most numerous group consisted of seamen from blue collar worker families (76.5%), followed by those with highly educated parents (13.6%) and farmers (9.9%).

Furthermore, places of upbringing as well as current places of residence of the seamen were analyzed. The majority

of them were brought up in medium sized (28.4%) or big (29.6%) cities, 25.9% in the countryside and 16.1% in small cities. A similar tendency was observed with reference to place of residence. 42% of the seamen lived in a big city, 32.1% - in medium sized ones, 12.3% - in the countryside and 13.6% - in small cities.

The time spent at sea by particular participants varied. As demographic analyses show, 12.3% were beginners, others spend varied length of time at sea. Those with the longest experience in working at sea (more than 16 years) constituted the equivalent of 32.4% of the crew.

An interesting distribution of the results was connected with the seamen’s educational background. The majority of them graduated from vocational schools (34.1%) and secondary schools (32.9%). The minorities were: a group who received primary education (24.4%) and highly educated people (8.5%). Seamen represented a broad variety of professions. Additional analyses showed that only 11% of the crew had specialist education preparing for work on ships (in particular: for their service). The rest of the group were representatives of “land” professions, in particular: mechanics, locksmiths, turners, painters, drivers, electricians, cooks. The majority of voyage participants obtained the qualifications required for the work on board a ship directly after the first boarding.

We would like to emphasize that the biggest professional diversity was among people engaged as fisherman specialized in food processing. Work in the food processing industry does not require special professional qualifications, but proper training. The most important factor during the recruitment process was the financial aspect of this work.

What is more, marital status of participants was included in the analyses. The majority of the crew consisted of married people (87.7%). The length of marriage varied. Amongst 71 married seamen – 28.2% were married for more than twenty years, 14.1% were married for less than five years with 57.8% of the seamen married for (6 to 20 years) Wives of seamen were in majority high school graduates (53.5%) and vocational schools graduates (21.1%). 27 wives – that is 38% of them – were better educated than their husbands. It is also worth emphasizing that 49.3% of them worked professionally – they were mostly women who graduated from at least high schools.

The latest demographic data analysed here was connected with the participants’ family structure. The majority of families included two children (40.8%). Families with an only child constituted the equivalent of 31.1% of all analyzed. 22.5% of the seamen had three or more children. Only 5.6% of the participants did not have any children.

Various measures were used:



a) the dynamics of stress during a distant sea voyage was assessed by (a study was repeated few times);

*the Spielberger State – Trait Anxiety Inventory;*

*the Kmiecik\_baran Feeling of Alienation Scale.*

b) marines' personality was assessed by:

*the California Psychological Inventory (CPI);*

*the Minnesota Multiphasic Personality Inventory (MMPI);*

*The Rokeach Value Survey;*

*The Eysenck Personality Questionnaire (EPQ); the Purpose in Life Test (Croumbaugh, J.C. & Maholick, L.T.).*

c) the quality of marines' family relations was assessed by:

*the Parental Attitudes Questionnaire (Ziemska, M);*

*the Family Communication Questionnaire (Roelofse, R. & Middleton, M.) in the Polish adaptation by M. Plopa;*

*the Marital Adjustment Questionnaire (Rostowski, J.).*

The demographic data presented above indicate a vivid diversity among seamen as regards the analysed variables. This is palpable evidence of diversified life experience as well as family and professional experience, which in turn, may influence general functioning during a long distance sea voyage.

The analysis conducted here encourage to formulate a few general thoughts, irrespective of more detailed results obtained from these studies. First and foremost, a thesis that the "psychological quality" of an individual's life spent in difficult conditions is closely connected with "the level" of his/her development is justified. This level is determined by the person's former life experience, which influences personal resources ready to be used in various, including particularly tough situations.

Those studies showed that an objectively difficult situation "releases" the individual's whole potential in order to reduce the impact of negative effects. In particular, this mechanism appears in the most difficult phase of isolation – that is approximately between day 80 and 100 of this period. As results suggest, in the first stage of isolation, all seamen handled this problem in a similar way, later in the following phases we noted evident diversification. Part of the group maintained a similar level of stress whereas others experienced intensification of this particular feeling. This is in accordance with literature, which indicates that the most difficult period of isolation for seamen, in terms of psychological burden, is the medium stage of the voyage.

These analyses are, as it seems, particularly valuable as they include the determinants of different tendencies in dealing

with stress and indicate where to search and find answers to such a phenomenon. A person in even a very difficult but short term situation probably relies on different psychological resources (e.g. cognitive, decisional competencies) than during long lasting isolation of a sea voyage. Therefore, it is very hard to predict human behaviour in such a voyage on the grounds of laboratory conditions. Due to this fact, studies presented here are so significant – it is their indisputable asset that they were conducted in conditions of real isolation, high and multidimensional deprivation. Additionally, it is worth emphasizing that almost the whole crew (nearly 90 people) participated in the studies. Earlier studies presented in literature, also conducted in the conditions of isolation, usually included much smaller working groups, which of course limited the possibilities of analyses concerning individual differences. Moreover, what is worth mentioning is the fact that studies presented here were concentrated on "personal costs" borne by seamen during the time of isolation instead of the usually analysed work efficiency.

The results of studies conducted by the author confirm that long lasting isolation at sea is a difficult situation determining the onset of stress among seamen. As far as *demographic variables* are concerned, it appeared that older seamen are much more predisposed to anxiety stress, whereas younger ones to stress stemming from the feeling of loneliness. Analyses also indicated a certain relation between dynamics of stress processes and such variables as: a level of education, experience of working at sea, place of upbringing and level of satisfaction connected with working at sea. The general rule observed here indicated that the most psychologically burdened with anxiety and a feeling of loneliness were seamen who graduated from primary schools and the beginners. Furthermore, participants with officer training and those satisfied with their work were more resistant to anxiety stress. Those results confirm that diversity of human behaviours in long lasting, stress generating situations is determined by life experience, formed and amended by various developmental stages and different social contexts.

The studies conducted by the author lead to many interesting conclusions connected with *resources of personality* as mediators of stress processes. It appeared that some of them help a person to tackle the problem of isolation stress more effectively, but on the other hand, others have a detrimental impact reflected in negative experiences of stress.

The role of *interpersonal competencies* was particularly noticeable, with high level of competencies bringing beneficial reduction of both, anxiety and loneliness related stress. It was shown that the ability of functioning well in various social groups plays a powerful role in those difficult situations, in which the possibility of removing the real danger is not high. Social competencies, as these analyses indicate, may make it easier for a person to perceive a difficult situation more optimistically, as reasonable and acceptable. People with the





need of “contact”, who express pro social values, probably do not concentrate on the perception of danger or on their emotions, and as a consequence, they do not experience the “hopelessness of their existence”. They are able to be “other oriented” (which is determined by values’ hierarchy), which in turn does not lead to a decline of individual well-being, but enriches the group with the feelings of calmness and optimism enhancing individual resistance to stress as well.

Another conclusion drawn from the presented studies is the confirmation of a thesis that a particular personality dimension - “*the strength of ego*” - is essential in modifying stress processes. This factor serves as protection against increasing anxiety and a feeling of loneliness during the isolation at sea. The mechanism of its influence probably boils down to applying, suitable for a particular situation, strategies of dealing with stress, which enables better, more “flexible” functioning. It is connected with an individual belief that one can control a situation, and has the possibility to predict future events and to accept them in the right way. Low self-consciousness may block access to potential personal resources, which is followed by the application of less flexible protection strategies based on immature forms of behaviour, directed mainly towards reducing the tension.

These studies allow us to emphasize the role played in stress regulation processes by those dispositional competencies defined as “*tough-mindedness*”. Seamen resistant to stress were characterised by a positive belief in the possibility of controlling a situation or events and were more emotionally well-balanced and could regulate their emotions. One can assume that they had a tendency to interpret stressors in a more positive way, better tolerated danger factors or they interpreted them as less endangering to their emotional homeostasis. In consequence, when dangers are not being perceived as particularly disturbing, they do not lead to the experience of negative emotional states like fear or anxiety.

Moreover, a personality dimension, indirectly “measured” in those studies, was *the sense of coherence* reflected by such indicators as: a hierarchy of values, a sense of life and a sense of control. This variable happened to be an important regulator of seamen’s inclination reflected in the resistance to anxiety and loneliness related stresses, although in various aspects and intensity. The results obtained show that the world perceived by seamen resistant to stress in isolation conditions is more reasonable, controlled and predictable. The meaning of life is not enhanced by strictly personal, that is self-oriented values, to the same extent as by pro social ones (mainly family values). This complex feeling of coherence in stress generating situations may trigger, adequately to the psychological burden, resistance resources and energy to tackle the difficulties, adding greater sense to one’s work, and allows for better functioning in an isolated social group, supporting others and, in turn, being socially supported.

Analyses clearly indicate that particular dispositional traits which are a part of individual resources may both facilitate the onset of stress and protect against it in the conditions of long lasting isolation. The psychological price “paid” for a stay in such a stressful environment is determined by a particular set of dispositional competencies. They are strongly connected with perception and assessment of ones own “situation” at sea by seamen, with implementing remedial measures in conditions of a long lasting separation and as a consequence, with both short and long term effects.

Another problem analyzed in the studies was the role of the “family variable” in mediating the stress processes in conditions of long lasting isolation required by the type of work done. Predictions emphasizing the essential function of *family support* as “the strength” helping to endure the difficulties of a voyage were confirmed. It is worth noticing that according to the seamen (examined in the medium phase of the voyage) the lack of contact with family members was the most frustrating during the voyage, even more than storms, missed ports, monotony or lack of entertainment. Psychological observations conducted on the ship as well as hundreds of conversations with participants corroborated this “family-orientation”. The analyses also confirm that seamen originating from highly integrated quality family systems bear lower emotional costs of a voyage. Family support may provide seamen with “protection powers” used against inner and outer stress and can serve as a key “buffer factor” reducing proneness to stress.

In the light of these studies, it appeared that difficulties of a voyage are easier to bear by seamen who have a strong relationship with their partners. A decision about working at sea is probably a mutual one, stemming from the realisation of shared marital or family values. This bond with someone very close to us leads to frequent “returning thoughts” about that person, which is a way of alleviating upsetting emotional experiences caused by isolation conditions. In land conditions, there is a real possibility to improve ones psychological well-being by direct contact with family members at home. At sea, this form of communication with them is, of course, unattainable. Realizing the fact that work at sea has not only a “personal context”, but mainly a pro family one, probably boosts the self-esteem of seamen that enables them to maintain the level of stress in “acceptable boundaries”.

It is probable that yet another argument may have an explanatory value in this context – people who “are able” to achieve a sense fulfilment in a family system have higher personal competencies. A strong bond with family members may facilitate trust in oneself and in other people, which in turn plays a beneficial role for individual well-being. Furthermore, it is a well-founded belief that people able to maintain mature interpersonal relations thanks to their satisfactory marital and family experiences, are also capable of implementing a mechanism giving emotional support to others. Moreover,



being an attractive partner of interpersonal relations in a isolated working group, they get a lot of boosters to their well-being in the form of feedback protecting them from upsetting emotional states, like the feeling of loneliness. Summarising, positive experiences connected with social relations in the family system may “exceed” limits of family structures and modify particular behaviours in isolation conditions.

The studies corroborated that having children as well as properly developed parental attitudes may increase the sense of responsibility for others, add greater value to one’s life and work, with the family bond as the most important reference group. Probably, seamen – fathers expressing proper parental attitudes are able to create a positive psychological ambience around them also in an environment different from a family one – therefore, also on a ship. It seems to be well-founded that fathers who respect their children, have greater personal resources, including interpersonal, on which they can rely in difficult situations. On the other hand, people who are “cold”, “rigid” in their attitude towards their children may cause interpersonal conflicts in conditions of social isolation, and as a consequence, antagonize other participants of a voyage, which in turn leads to loneliness or rejection. Generally speaking, on the ground of these studies, “family variables” may serve as an essential predictor of the “quality” of human functioning as well as the amount of psychological costs borne in long lasting, stress generating conditions. They display sufficient predictive value in order to interest not only theorists of stress but also institutions responsible for organising work in conditions of long lasting isolation.

In the last segment of this presentation, we would like to concentrate on practical implications stemming from aforementioned analyses. It can be assumed that the development of civilisation will lead to a greater demand for living in separation from one’s basic environment (scientific expeditions, military, cosmic or sea voyages/missions, trip/managerial work etc.). Therefore, taking under consideration work efficiency as well as personal price paid by people living in isolation, it is justified or even required, to optimize psychological conditions of their functioning. First and foremost, there is a need for greater “humanization” of social relations in the situation of isolation, which is connected with a proper policy of selection. To begin with, adequate selection of management staff is required - they should create a special climate of interpersonal relations. People responsible for recruitment should concentrate not only on managerial, professional knowledge but also on “psychological competencies”. The style of management characterized by respectful attitude towards workers may to great extent reduce their emotional burden. We cannot forget that, in the situation of a sea voyage, seamen are not able to deal with particular emotions by leaving the ship and meeting with family members at home, as it usually happens “on land”. Their work environment serves them also as a place of living

– for that reason they “deserve” to live in “decent” conditions. Policies of selection should therefore set high requirements, as regards psychological criteria (at least those analyzed in this presentation) to be met by potential employees working in long lasting isolation conditions, and by officer staff in particular.

It also seems to be justified to create possibilities of giving psychological support to seamen. The idea to have a psychologist on board may be an utopian one, but neither seamen nor their families are supported in that way even on land. On the other hand, it seems that a doctor working usually on bigger ships could be properly prepared in order to fulfil in a way the role of “a therapist”.

Taking into consideration psychological needs of seamen, and their demand for communication with family members in particular, possibilities should be created (in various forms) for frequent contact with the family. Studies conducted as well as psychological observations on board a ship indicate the great importance of any form of contact for seamen with their families (by mail, telephone etc.). It seems to be the most effective form of alleviating separation stress as well as a factor protecting against it.

It is also beyond question that the duration of a voyage generates another problem substantiating the need for shortening this period of isolation. It may be of lesser importance in incidental expeditions, but it has a detrimental influence on professional seamen who frequently live in difficult conditions. Analyses presented above showed that long lasting separation generates particular psychological costs, which, as the theory of stress indicates, may lead to long term consequences in the future, e.g. deceases.

It seems that another aspect connected with separation stress should be considered, i.e. the functioning of seamen’s families. Going of a seamen (a father, a husband) to sea constitutes a particular stressor also for his family. For that reason, probably, the costs of separation are borne by the whole family system, not only by the man himself. However, this problem requires further, wide-ranging, scientific analyses (psychological and medical), which the author of this presentation is partly involved in. Former studies suggest that in particular areas of psychological functioning, a burden is also placed on wives and children. From the social policy’s broader perspective, it is justified to analyze the relation between incomes of sea enterprises and “effects” of frequent separation afflicting seamen’s families. It is certainly “an argument” for conducting further interdisciplinary analyses.

The author expresses his belief that the studies presented above allow for better understanding of stress processes and certainly justify “investment” in individual and family psychological resources.