

DROP-OUT - INADEQUATE RESPONSE OF SEAFARERS TO STRESS

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SUMMARY

Background: Seafarers are usually exposed to many stressors that are related to different duties on board. Several notable researchers have argued that stress is a transactional phenomenon between the individual and the environment that is largely dependent on the meaning given to the stimulus by the perceiver. One of the many causes of stress are poor communication skills.

Subjects and methods: The aim of the study was to explain why respondents drop out of research. The project was originally supposed to take place over a period of two years and involve a minimum of 30 respondents per group (30 skippers and 30 seafarers) who would take part in the research for at least four weeks while on board, or during the skipper season. Activity was to be measured with the Polar A370 fitness tracker, worn as a wrist-watch or bracelet and used for 24-hour heart rate, bodily activity and sleep pattern tracking for every respondent. The other device used is TANITA MC780MA, which is a segmental body composition analyser.

Results: We contacted overall 146 seafarers, of whom: 40 (27.4%) skippers, 43 (29.5%) deck officers and 63 (43.1%) engine officers. Participation was refused by 18 (12.3% of all contacted) individuals and 108 (74.0%) respondents dropped out during the research. Due to group dispersal and a low number of respondents who reached the end of the research, the project will have to be prolonged.

Conclusion: We believe that the reasons behind respondent dispersal can be found in their inability to recognize the state they are in and in poor communication skills, while at the same time being exposed to extreme and possibly precarious work conditions. This forms a closed loop that only continues to generate even higher stress levels. Further research is needed to look into this phenomenon.

Key words: seafarers - stress - drop-out

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INTRODUCTION

As technical improvements were made to ship propulsion, navigation and communications systems and with the ten-fold increase in displacement of seagoing vessels at the end of the 20th and the beginning of the 21st century, the living and working conditions on board ships improved significantly. The use of fax machines, mobile phones and emails has given crews direct communication with the ground and other vessels at affordable prices, making it easier for them to withstand separation from their families.

Reduced physical activity, an abundance of food, smoking often combined with stress due to fast living and shorter stops/turnaround times at ports are probably the leading causes of high incidence of obesity, diabetes, cardiovascular disease and various psychological disorders in seafarers.

Fast living and time-related pressures are leaving a toll on seafarers as well, sailing on all types of vessels. In principle, all seafarers on passenger and merchant ships as well as skippers are exposed to deadline-related stress. The navy is a different category as it has special rules of operation and different stressors, even though there are more similarities in the profession and work organization than differences. Numerous studies have been conducted focusing on work stress, fatigue and health risks of "traditional" seafarers (Bridger et al. 2010, Carotenuto et al. 2012, Hystad & Eid 2016).

Work on merchant navy ships takes place in so-called "guardias" – which means that work takes place in shifts and irrespective of the circadian rhythm. Sleep has the most important influence on the circadian rhythm (Grech et al. 2008). On merchant ships some personnel work a repeating "4 h on; 8 h off" watch at sea and normal daytime work hours when alongside (Bridger et al. 2010).

In the very dynamic sector of nautical tourism, skippers have one of the most work-intensive jobs. The Croatian Bureau of Statistics listed skippers as a profession in the National Classification of Economic Activities as early as 1998, but without a job description (Official Gazette 1998). A professional skipper works 16-20 weeks non-stop during high season, which is extremely demanding and stressful both psychologically and physically, considering the sleeping arrangements and lack of any type of routine. Unlike the relatively "new" skippers, nautical and engineer officers are well known professions with relatively well researched psychological and physical work conditions. We have not been able to find research on physical strain, psychological stress or the quality of sleep in skippers in the available literature. According to data from the media, there are around 200 skippers registered in Croatia, who earn between 800 and 1,000 euros per week, or 150 euros if hired by the day (Posao, url). We assume that this relatively high salary is one of the reasons why young people decide to work as skippers, as four

months of work will cover a year of their living costs. Before the COVID-19 pandemic, skippers were among the most sought-after professions. According to a study of the Institute for Tourism, Zagreb, there has been a spike in the rental of vessels with skipper/crew in comparison with 2012 (from 22% in 2012 to 44% in 2017). According to the same study, 34% boaters hired a skipper or a crew (51% charter and 10% on other vessels) (Marušić et al. 2018).

Considering the lack of research and the assumption that exposure to stress is relatively high, the Faculty of Maritime Studies in Split organized a research titled “Physical activity, sleep patterns and psychological stress in skippers and nautical officers”.

Stress and Stressors in Seafaring

The seafaring occupation is characterized by specific psychosocial, work-related, and environmental stressors, all of which have many potentially adverse effects on the seafarers’ health, safety, and well-being. From a review of the contemporary literature in the field arises the issue of implementation of occupational stress management programmes in the maritime sector. Occupational stress in seafaring is presented in a many papers (Slišković & Penezić 2018, Slišković 2017). The stressors in seafaring are numerous and may be quite different. On the very long list of stressors that seafarers are exposed to are: storms and adverse weather, extreme temperature variations, the inability to leave ship at free will, illnesses and injuries, inspections, noise and/or vibrations, motion sickness, fear of getting stranded or of colliding, criminalization of seafarers, piracy/hijacks or kidnapping ashore, conflict between crew members, work licence renewal (medical checks), separation from family, long working hours and work in shifts, irregular and poor-quality sleep, food quality, the quality of the ship and accommodation arrangements, insufficient training of some crew members, multinational crews, frequent crew turnarounds, lack of job and contract security, stress due to preparations for on-/off-loading. Furthermore, dynamic changes, crises, seasonality and increasing job insecurity or higher rates of precarious work are also characteristic of seafaring (Slišković & Penezić 2018, Slišković 2017, Standing 2011).

In his book “The Precariat: The New Dangerous Class”, Guy Standing warns that a new social class has emerged, made of people who live in a permanent state of uncertainty and insecurity, defined by unstable labour arrangements, part-time and temporary jobs, lack of identity, all of which contribute to instability not only in their lives but in the whole community and could lead to dangerous social phenomena such as social marginalization, political extremism, criminal and violence (Standing 2011).

Such employment generates high stress levels precisely due to the high degree of instability of working and living conditions, general insecurity, unpredictability,

and constant struggle to survive or make ends meet. Precarious work involves, for example, fixed-term work, undeclared work, temporary jobs (“gigs”) through agencies, work on projects, artists’ part-time work, and generally a constant insecurity in the marketplace. This is especially visible today in the maritime, nautical and tourism sectors, where seasonality of work is a primary characteristic, and global crises like pandemics or wars can threaten a whole area or sector and lead to social crises (Standing 2011). Skippers and those who earning a living as skippers are classic examples of precarious employment even though their wages are relatively high once they do find employment.

Seafarers’ working hours

Although labour rights have been well regulated (European Commission 1999), at least on board ships sailing under EU Member States’ flags, skippers will often race for profit working 16 hours per day, for days in a row. Fatigue accumulates due to psychophysical strains, lack of breaks, and sleep in inadequate conditions, as space is always lacking on ships. This means that skippers often sleep in the common area, which means they cannot get a good night’s rest.

Seafarers who work on passenger and merchant navy ships struggle with similar issues of overtime and chronic fatigue (Oldenburg et al. 2009, Oldenburg & Jensen 2019, Hystad & Eid 2016).

Skipper’s Characteristics and Duties

Skippers are by definition captains or masters of small boats. Shipmasters have absolute authority on the ships they navigate, but they also have great responsibility. The fact that the shipmaster is responsible for everything that happens on the ship and with the ship and its passengers should not be forgotten when guests insist on sailing out in bad weather or when accepting a job on a “party boat” where most of the crew/passengers spent days on end under the influence of alcohol and/or drugs.

Being a skipper is physically highly demanding, so skippers have to be healthy, fit, with good endurance capabilities, communicative, reconciliatory in work with others, able to take care of passenger safety and security, resourceful and must have a “love for the sea”.

In Croatia, the high season for skippers is usually between 16 and 20 weeks long, starting in late spring and spreading into the summer and early fall. Some skippers do work winters but for now that is not too common in Croatia, where in wintertime they usually find another job or go back to study.

Skippers are expected to be responsible, emotionally stable, patient and resourceful persons, able to create a positive atmosphere and to spark interest in their passengers – in short, they have to be psychologically fit. The job usually takes place on the deck of the boat or yacht, mostly during the day, but sometimes during

the night as well. They usually work standing and often have to reach up or bend down, which again requires fitness and strength. A good psychophysical condition is the main precondition for the intensive and challenging job of a skipper.

The aim of this article was to determine how the duties of a skipper, taking into account the inherent stressors and peculiarities, affect skippers' sleep and subjective respondents' feeling of stress and fatigue and to compare that with "traditional seafarers" who were used as a control group. In the context of this article, "traditional seafarers" are engine and deck officers. Other crew members have not been covered by this research due to low responsibility levels. During the research, we were faced with high drop-out rates of respondents who volunteered to join the research, thus the focus shifted on the reasons behind the drop-out.

The hypothesis was that cooperation would be good, and drop-out rates low, since respondents volunteered to take part in the research.

SUBJECTS AND METHODS

The project was originally supposed to span two years and involve a minimum of 30 respondents per group (30 skippers and 30 "traditional" seafarers per year) who would take part in the research during the four weeks they are sailing, or during the high season for skippers. The Polar A370 tracker would be used as a measuring device, worn as a wristwatch/bracelet. The Polar A370 is used for 24-hour tracking of heart rate, bodily activity and sleep patterns for every respondent. The other device used is a TANITA MC780MA, which is a segmental body composition analyser, crucial for determining the initial, interim and end condition of respondents during the implementation of the project. Data thus collected would be processed using GMON software – a computer programme used for analysing data obtained from TANITA device measurements. In order to determine respondents' psychological condition, we used a general forms and questionnaires on the perception of stress and bodily activity. Inclusion criteria are active seafarers/skippers who accept to be included in the research. Exclusion criteria refer to those (skippers) who have been on board for less than a month or who do not agree to wear the watch or do not want to answer questionnaires. We deliberately used volunteer-based sampling methods hoping there would be little drop-out.

RESULTS

During the first year of the research, of the total 146 contacted seafarers (40 skippers (27.4%), 43 deck officers (29.5%) and 63 (43.2%) engine officers – see Table 1) who had so far been presented (in groups or individually) the project, the majority of those who adamantly refused to take part in the research fell within the skippers group. Of the 40 skippers contacted, 10 refused to take part in the research, followed by deck officer, where 8 of the total 43 contacted refused participation. Not a single engine officer declined participation at the beginning, but during the research as many as 56 or 88.9% dropped out for different reasons. However, at the end of the first year the best participation rates were recorded among the skippers group: of the 30 who agreed to take part, 11 (36.7%) finalized the research. Deck officers were among the fewest at the end – only two or 4.7% of the initially contacted remained. Engine officers were somewhat more numerous: they were the biggest group, no one categorically refused to take part, while 7 (11.1%) of the total contacted finalized the research (Table 1).

Initially, our aim was to compare stress levels, sleep disorders and changes in bodily structures in skippers with those recorded in "traditional seafarers" after a period of time spent working on board. In this research the "traditional seafarers" were the control group consisting of engine and deck officers. However, the study must be prolonged since only few respondents stayed till the end: of the 146 initially contacted, 128 agreed to take part, but by the end of the research the overall drop-out rate was 84.3% (108/128). Engine officers were the most numerous – both in the number of those contacted and in the drop-out rate (88.9%).

The hypothesis that cooperation rates would be high, and drop-out rates low, because the respondents volunteered to take part in the research, was not confirmed.

DISCUSSION

There are many factors that affect work stress in the maritime industry (IMO 2019, Grech et al. 2008). There is no doubt that work at sea involves multiple risk factors for fatigue, which in addition to acute effects (e.g., impaired cognition, accidents) contributes through autonomic, immunologic and metabolic pathways to the development of chronic diseases that are particularly prevalent in seafarers. Most adults need between 7 and 9 h of

Table 1. Number and structure of seafarers during the first year of the research

Contacted seafarers	Skippers	Deck officers	Engine officers	Total
N (%)	40 (27.4%)	43 (29.5%)	63 (43.1%)	146
Refused participation	10 (25%)	8 (18.6%)	0	18 (12.3%)
Dropped out	19 (47.5%)	33 (76.7%)	56 (88.9%)	108 (74.0%)
Completed the research	11 (27.5%)	2 (4.7%)	7 (11.1%)	20 (13.7%)
Overall	40 (100%)	43 (100%)	63 (100%)	146 (100%)

sleep per day, preferably during a single major sleep period at night, but this may be difficult to obtain at sea - in particular with work in shifts (Jepsen et al. 2015, Kocalevent et al. 2011).

Fatigue has been defined in many ways, one of which is 'a subjective, unpleasant symptom which incorporates total body feelings ranging from tiredness to exhaustion, creating an unrelenting overall condition which interferes with an individual's ability to function in their normal capacity' (Ream & Richardson 1996). Fatigue can be triggered by previous perceived stress which may lead to impairment of performance and function. Stress, including psychological stress, can also have a biopsychosocial influence on fatigue (Kocalevent et al. 2011). The International Maritime Organisation (IMO) defines fatigue as "a state of physical and/or mental impairment resulting from factors such as inadequate sleep, extended wakefulness, work/rest requirements out of sync with circadian rhythms and physical, mental or emotional exertion that can impair alertness and the ability to safely operate a ship or perform safety-related duties" (IMO 2019). Gradually, the growth of the study of psychology has led to a proliferation of definitions, which has not necessarily helped to clarify the meaning of the term (Baqtayan 2015).

A literature review on psychological stress in seafarers concluded that seafaring is associated with mental, psychological and physical stressors with the most important stressors being separation from family, loneliness on board, fatigue, multi-nationality, limited recreation activity and sleep deprivation (Jepsen et al. 2015). Taking into account the frequency of seafarer fatigue and the severity of its consequences, the effectiveness of the existing legislative framework and the coherence of industry, international merchant fleet staff and optimized working, living and sleeping conditions at sea should be considered, although everything seems well regulated.

Seafarers in the merchant fleet are the most studied among maritime workers (Carotenuto 2012, Oldenburg et al. 2009, Hystad & Eid 2016).

There were, however, no studies concerning skippers in the available literature. Although skippers are a seafaring occupation, we believe that the risk and stress exposure levels are higher for skippers than for seafarers sailing merchant navy ships. Well-developed senses, perception, situation awareness, decision making, physical strength and motor skills are abilities needed for a skipper job. These abilities are not constant; they are modified by many factors such as age, gender, personality, and level of maritime experience. These abilities can be modified by transient forms of impairment induced by fatigue, alcohol or drugs and by more permanent conditions of impairment brought by neuropsychological, musculoskeletal and other medical disorders also (Grech et al. 2008).

We found the number of seafarers who agreed to and then dropped out of the research to be surprising. Such

results indicate that emotional factors could have an impact on the ability to clearly refuse cooperation and verbalize one's attitude, which could be linked to latent feelings such as fear, insecurity, awkwardness and inability to directly oppose authority, i.e. high anxiety levels. This phenomenon was far more present in engine than in deck officers and further research is needed to explain it.

Our experience implementing research at the Faculty of Maritime Studies in Split since 2019, titled "Physical activity, sleep patterns and psychological stress in skippers and nautical officers", shows that it is difficult to motivate seafarers to stay with the research team until the end. Looking at the communication skills of seafarers who refused participation, we see a lack of basic communication skills since their resistance to participation was not verbalized but instead expressed through avoidance, which is a defence mechanism. Another defence mechanism was negation, applied when talking about ways to objectivize and face stress and potentially stressing situations that seafarers have to cope with.

The lack of communication skills, especially those related to anxiety, fears and negative thoughts generate and elevate stress levels. Wanting to say something, to complain or seek help, and not being able to do so due to one's own communication limitations, are today more than ever characteristic of seafarers, who are usually highly individualistic.

Failure to recognize one's own psycho-physical condition can be related to refusals to take part in research, as persons who are aware of the state they are in would normally talk about their problem, instead of hiding or avoiding to clearly state their minds.

Research in some cultures has shown that organizational culture has the greatest impact on the quality of work life (Kim & Jang 2018). In terms of lifestyle, Croatian seafarers are of the Mediterranean type – and they have their own specificities. In any case, ways to reduce job stress should be investigated in line with our specific organizational culture.

There are several limitations to this study. At first sight, the respondent sample may seem small, but Croatia is a country with few inhabitants but relatively many seafarers. Another problem is the high drop-out rate from a sample that is already limited. The authors admit that there may have been better ways to motivate respondents, but at the same time high drop-out rates can be a consequence of an inability to recognize a mental state that might have symptoms similar to those of depressive disorders.

CONCLUSION

The authors describe the problem of high drop-out rates among respondents/seafarers. Although the respondents volunteered to take part in the study after hearing a detailed explanation of how it would be undertaken and after learning about the possible benefits for their health, after the research began most seafarers simply

stopped getting back in touch. Bearing in mind the clearly adverse working conditions and possibly precarious employment, we assume that the reasons for that lie in their inability to recognize one's own condition and in inadequate communication skills. This closes the loop, generating even more stress. Further research is needed as excessive stress that goes unrecognized could be linked to depressive disorders.

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Contribution of individual authors:

Andrea Russo participated in the design of the study, analyzed the data results and interpretation of data.

Nikola Mandić & Merica Slišković participated in patient enrollment and questionnaire distribution, in literature searches, and interpretation of data.

Rosanda Mulić participated in the design of the study, literature searches and analyses, in statistical analyses and interpretation of data and writing the article.

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