



Seafarers Hospital Society & Yale University

Seafarer Health: Research to Date and Current Practices

Final Report

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Martin D. Slade, PhD, MPH

Yale



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Executive Summary

This Maritime Worker Health research project incorporates a review of the published literature on seafarer health and wellbeing, including recommendations to improve health and wellbeing among this population, practices implemented by the industry, as well barriers to full implementation. Additionally, the themes identified from a series of round table discussions aimed at preventing poor health among seafarers in the long term by identifying impactful, implementable action with representatives of shipping companies, policy makers, and maritime welfare organizations as well as the Seafarers Hospital Society, Lloyd's Register Foundation, and Yale University are reported.

The literature search resulted in 3,706 papers for which abstracts were used to determine relevancy. This led to 127 articles that were utilized for this study. Four round tables, designed to obtain viewpoints from the perspective of shipping companies, NGOs, trade unions, and regulatory bodies were held virtually, during the summer of 2021. Each of the four round tables incorporated a directed approach utilizing open ended questions, to delve into what was deemed possible and worth doing in terms of addressing the long-term risk factors affecting seafarers' psychological wellbeing. For these round tables, risk factors were grouped into four umbrella topics: (1) Interpersonal factors, (2) Training, (3) Living conditions, and (4) Work demands. The results of the literature search and the round table meetings were analyzed with a mixed methods approach so that a fuller picture could be developed regarding the wellbeing of maritime workers, the incorporation of recommendations from the academic community, the results of those interventions on the health and wellbeing of seafarers, as well as the barriers encountered implementing these recommendations.

Various stressors were identified from the literature review to be acting within the overall seafarer population.

It was found that these stressors could be grouped into five categories, namely, (1) Work environment, (2) Organizational, (3) Cultural, (4) Physical, and (5) Psychosocial. These stressors can act independently, or jointly, to decrease the health and wellbeing of seafarers which, unfortunately, was found to be worrisome, especially with regard to their mental health. Issues regarding seafarer wellbeing were able to be grouped into the following three categories: (1) Physical, (2) Psychological, and (3) Personal / Lifestyle. A myriad of recommendations to improve seafarer wellbeing were found to be included within the literature. These were grouped into six categories: (1) Physical, (2) Psychological, (3) Personal / Lifestyle, (4) Organizational, (5) Individual, and (6) Research.

The published papers described several different interventions that have been put into practice by shipping companies to increase the health and wellbeing of seafarers. The discussion regarding the interventions put into place, including the methods employed for their implementation, the willingness of seafarers to embrace the interventions, and the evaluation of the effects of the interventions, are limited. The various interventions tended to target different factors with regard to seafarer wellbeing. These included, work demand, mental health, lifestyle, stress management, and work satisfaction.

Numerous barriers to implementation of interventions were noted. Perhaps first and foremost was cost. Although some of the recommendations to improve the health and wellbeing of seafarers would require capital expenditure, many more of them would increase the operating costs. For example, increasing crew size would significantly reduce many of the stressors that seafarers face each day, but in a competitive industry, unilaterally increasing operating costs could have a serious impact on the financials of the business. Regulation could make

this more attainable, but there is currently little appetite to increase regulations to the industry, especially if it will raise the cost of operations. Corporate mindsets that look for profit in the short term hinder investments that would increase profits in the long term if they increase costs in the near term.

The four round table sessions were found to revolve around twelve different topics within the realm of methods to increase the wellbeing of seafarers. These twelve topics were: (1) Crew size, (2) Bureaucracy, (3) Culture of care, (4) Evidence and causation, (5) Training, (6) Food and water, (7) Accommodation, (8) Recreation, (9) Contract length and timely relief, (10) Bureaucracy and fatigue, (11) Ship-shore communication and relationship, and (12) Job satisfaction. Many of the round table participants believed that sharing of data and knowledge across the industry would be extremely helpful in quickly improving the wellbeing of seafarers.

In conclusion, there is great potential to increase the health and wellbeing of seafarers and, in particular, the mental health of this population. There is low hanging fruit such that some changes could be made quite quickly and with little expense or disruption to current practices and yet, be expected to substantially increase the life of the seafarer. It is recommended that a "culture of care" is embraced by the maritime industry. This "culture of care" is not only about caring for the seafarers, but extends to caring for the organization, caring for society and caring for the environment. A "culture of care" can be a core element leading to decent work wherein employment "respects the fundamental rights of the human person as well as the rights of workers in terms of conditions of work safety and remuneration...respect for the physical and mental integrity of the worker in the exercise of his/her employment"¹. As a "culture of care" is adopted, seafarer wellbeing and job satisfaction will improve and retention rates should

increase. This will allow for the corporate knowledge to be retained while reducing the high cost of training new employees and reduce learning curves during which there are high probabilities of accidents and injuries. Although it needs to be looked at as a long-term investment, a paradigm shift to a "culture of care" will ultimately improve the lives of seafarers and their families while reducing operating costs; a win-win opportunity.

It is also recommended that the work required to make this shift to a "culture of care" a reality, which is the ultimate goal, will require all stakeholders in the maritime industry to work as a partnership. With this in mind, I am personally asking these stakeholders including shipping companies, crewing agencies, chartering companies, P&I clubs, and charities to join with us in this endeavor. This will provide more than a window into research, but will include all as partners into the research and implementation of interventions to improve the health and wellbeing of seafarers; a truly noble goal.

Introduction:

Background:

There has been relatively limited literature on the health of maritime workers as compared to other occupations. Published studies regarding the health and wellbeing of seafarers have been increasing in recent years. Google Scholar returns 393 results when search terms of "seafarer", "maritime", "health", and "wellness" are utilized. Of note, 323 (82%) of these articles were published in the last ten years. A clearer understanding of the stressors affecting seafarers' wellbeing, the recommended approaches for improving the wellbeing of these workers, and the degree to which these recommendations have been put into practice, the barriers encountered and the resultant effect upon seafarer wellbeing would be of great benefit to the industry.

In May 2021, the Seafarers Hospital Society contracted with Yale University to determine the practices that have been put into place within the shipping industry to maintain seafarer health and to determine their perceived effectiveness. Three specific aims were defined:

- Aim 1. To ascertain practices put in place by the shipping industry regarding seafarer health and safety,
- Aim 2. To determine the coverage of these practices across the industry, and
- Aim 3. To assess the perceived effectiveness of these practices.

During the conduct of the study, it became clear that the published stressors affecting the wellbeing of seafarers should also be ascertained as these are the upstream, and possibly modifiable, causes of ill health among seafarers.

Methods, Data, and Analysis:

In this document, the Yale University reports conclusions of this Seafarer health research project incorporating a review of the published literature on seafarer health and wellbeing, including recommendations to improve health and wellbeing among this population, practices implemented by the industry, as well as barriers to full implementation. Additionally, the themes identified from a series of round table discussions aimed at preventing poor mental health among seafarers in the long term by identifying impactful, implementable action with representatives of shipping companies, policy makers, and maritime welfare organizations as well as the Seafarers Hospital

Society, Lloyd's Register Foundation, and Yale University are reported. The relevant literature for this review was sourced using PubMed and Google Scholar databases. The search criteria used the keywords "seafarer", "maritime", "wellness", "mental health", "physical health", "health", "interventions", "wellbeing", and "well-being". Additionally, a time frame covering the last fifteen years (2006 – 2021, inclusive) was specified. All relevant papers were available without need to contact the authors. Only primary peer-reviewed articles that were published in English were included. The search resulted in 3,706 papers for which abstracts were used to determine relevancy. This led to 127 articles being utilized for this study. Each of these articles were read to determine the stressors, wellbeing issues, recommendations, practices either studied or put into practice, results of these practices with regard to seafarer wellbeing, and the barriers to implementation of recommendations.

Two round tables, designed to obtain viewpoints from the perspective of shipping companies were held virtually, the first on June 29, 2021 and the second on July 15, 2021. The round tables were hosted jointly by Lloyd's Register Foundation, Seafarers Hospital Society and Yale University and were conducted under Chatham House rules (Under the Chatham House Rule, anyone

who comes to a meeting is free to use information from the discussion, but is not allowed to reveal who made any particular comment. It is designed to increase openness of discussion). Each of the two round tables followed the same structure, namely, a directed approach utilizing open ended questions, to delve into what was deemed possible and worth doing in terms of addressing the long-term risk factors affecting seafarers' psychological wellbeing. Risk factors were grouped into four umbrella topics:

1. Interpersonal factors,
2. Training,
3. Living conditions, and
4. Work demands.

After a brief introduction, the members of each round table were placed into one of two breakout rooms. Members of the first breakout room discussed the first two categories of risk factors: interpersonal factors and training. Members of the second breakout room discussed the last two categories of risk factors: living conditions and work demands. Discussions within each breakout room lasted approximately one hour after which everyone was rejoined for a short synopsis of the discussions held in each group. The meetings were recorded with the permission of the attendees so that a transcription of the round tables could be created

for use in the qualitative analysis.

Ultimately, the results of the literature search and the round table meetings were analyzed with a mixed methods approach (A mixed methods research involves combining qualitative and quantitative approaches within a study. In all cases, it expands research in a way that any single approach cannot. As a result, the research is more comprehensive) so that a fuller picture could be developed regarding the health and wellbeing of seafarers, the incorporation of recommendations from the academic community, the results of those interventions on the health and wellbeing of seafarers, as well as the barriers encountered implementing these recommendations.

This report will describe the noted stressors for the health and wellbeing of seafarers. It will then note the current wellbeing issues among that population. Next, the published recommendations to improve seafarer health and wellbeing. The practices incorporated by industry, along with the observed result and barriers to implementation will then be discussed. Following that, the results of the qualitative portion of the study will be described. Lastly, the overall results based on both the quantitative and qualitative portions of the study will be presented.



Results and Discussion:

Stressors identified from literature review:

The following is a discussion of findings regarding stressors identified within the overall seafarer population. The stressors are grouped into five categories however it should be noted that these grouping are somewhat arbitrary in that certain stressors contain elements that would allow them to be classified into a different category. Nonetheless, the categorization scheme utilized appears useful to understanding the strains that seafarers encounter. The five stressor categories are: (1) Work environment, (2) Organizational, (3) Cultural, (4) Physical, and (5) Psychosocial. Work environment:

Stressors identified from the literature within the work environment include being away from home for extended periods. These periods vary by nationality whereby the average length of tour from Danish and UK seafarers was 3 months whereas it was reported as 8 months for Indonesian and Filipino seafarers. While on board, seafarers work long hours, typically seven days per week. As shipping is a 24 hour per day business, seafarers must also work at night which in and of itself can lead to increased levels of stress. They are also under time pressures so that they are required

to work at a rapid pace. Although there has been increased automation and mechanization of work as well as improvements in navigation technologies, seafarers note increased workload. This apparent contradiction is likely the result of a change in the work performed by some seafarers wherein they now need to integrate the demands of technology. Another possible reason for the noted increased workload is the increased commercial pressures that have led to shorter turnaround times at ports. Even with the improved navigation technologies, variable and harsh weather at sea can be quite stressful. Other work environment stressors discussed in the literature include concerns about piracy, exposure to violence or threats of violence on board, and a lack of leisure time physical activity opportunities.

Organizational:

Various stressors were documented that are a result of organizational philosophy and conduct. It has been reported that seafarers engage in dangerous work practices and that they lack adequate training and are ignorant of rules and instructions. At least in part due to current crewing levels, seafarers experience poor sleep quality as well as sleep deprivation. It was noted that there is a lack of rest periods and

relaxation on board ships as well as absence of social activities. Poor safety climates and poor safety cultures have been reported as well as an uncaring work environment. The shipping companies are responsible for providing food for the seafarers while they are on board, however concerns over not getting healthy food and clean water have surfaced. Poor healthcare access and concerns about confidentiality with regard to provided healthcare are other stressors that originate at the organizational level. It has been reported that seafarers lack information for daily needs. This could be lack of knowledge regarding work procedures as well as lack of being able to access information regarding their health. Other organizational stressors documented within the literature include seafarers having limited decision latitude, receiving low wages, being required to handle increased paperwork due to the Maritime Labour Convention, 2006. Additionally, female seafarers have noted gender discrimination regarding promotion. Maritime pilots have some additional organizational stressors including unpredictable work assignments, irregular deployment system, irregular meal times, and little advance warning of being required for duty.

Cultural:

With the globalization of the shipping industry, multicultural crewing has increased. It was noted back in 2002 that 65% of the world's merchant fleet was staffed with multinational crews. Without minimizing the positives of having multinational, multiethnic, and multicultural crews, they bring with them their own set of cultural stressors. Living and working with people that have differing cultural norms and beliefs, tied to the hierarchical structure of most ships, can lead to a sense of isolation among seafarers. A multilingual crew can add to this cultural stressor. Additionally, it takes time to acclimate to a multicultural environment and during this time seafarers may experience acculturative stress. Comparing the percent of ratings and the percent of officers by nationality reveals a disparity whereby European seafarers are more likely to hold officer positions. This discrepancy can result in stress for the underrepresented seafarers. Lastly, diverse ethnic groups can pose potential for conflict.

Physical:

Various physical stressors have been recorded in the published literature. Seafarers face harsh working conditions on board. They must contend with the stresses caused by ship noise, vibration, and motion. Additionally, they work in areas of high temperature and humidity. All of these physical stressors are not only present while they work, but while they are awake off-duty as well as their sleep periods. It has

been reported that there is a lack of physical activity among seafarers which is not good for their health and wellbeing. Lastly, among all seafarers, but especially among maritime pilots, the physical demands associated with boarding and departing vessels is another stressor.

Psychosocial:

The literature identifies many psychosocial stressors among the seafaring population. Seafarers live and work on board a ship with a limited number of other people. They have noted that they worry about ship safety as well as the families that they left at home. Published literature has noted their poor quality of life undoubtedly, at least in part, due to their feelings of loneliness and boredom as they live in relative social isolation. As the size of ships have increased necessitating docking at deeper water ports, the distance from the port to the city have increased. At the same time, there are shorter turnaround times at port. Since 2004, the initially free access to the port area has been restricted to authorized personnel as part of the International Ship and Port Facility Security Code. The seafarers, therefore, have difficulty leaving the ship area while friends and family are not allowed in that area. More recently, with the outbreak of the COVID-19 pandemic, many countries refuse to allow seafarers to go ashore. In fact, some countries refuse to let ships even dock. All of these psychosocial stressors increase job dissatisfaction. Effort-reward imbalance as well as overcommitment of officers likely

due to their high level of leadership responsibility, have also been documented. Published articles have noted that seafarers experience bullying on board the ship, harbor distrust, and have high perceived stress levels. Additionally, as they work in a hazardous industry, seafarers experience serious accidents with injuries, death and suicide on board, vain efforts to rescue crew members, all of which can lead to extreme strain. Due to the nature of the shipping business, most ratings are on short term contracts. Their lack of job security due to the uncertainty of work after the current contract expires is stressful. Finally, another psychosocial stressor is due to the tendency for seafarers to be criminally prosecuted for maritime accidents beyond their control.

Table 1 depicts these various stressors in tabular form.

Work environment	Organizational	Cultural	Physical	Psychosocial
Time away from home / Family separation	Lack of availability of information for daily needs	Ship culture matching	Heat in work places	Social insolation
Time pressures at work	Absence of social activities	Multinational crews / multiethnic crews	Harsh working conditions	Worries about family
Long working hours	Sleep deprivation / poor sleep quality	Acculturative stress	Lack of physical activity	Worries about family
Increased workload	Little advance warning of being required for duty [pilots]	Multilingual crew and hierarchical structure lead to sense of isolation	Noise	Worries about ship safety
Lack of leisure time physical activity opportunities	Irregular meal times	Diverse ethnic groups can pose potential for conflict	Vibration	Boredom
Increased commercial pressure (shorter turnaround)	Dangerous work practices	Disparity in percent officers by nationality	Temperature	Perceived stress
Working at night	Ignorance of rules and instructions		Humidity	Loneliness
Variable weather	Poor healthcare access		Ship motion	Bullying
High onboard biomechanical demands	Lack of rest period and relaxation		Physical demand boarding / departing vessels	Increased uncertainty of, and short-term, contracting
Rapid work pace	Limited decision latitude			Extreme strain and crisis intervention
Exposure to violence or threats of violence	Irregular development system			Experiencing serious accidents with injuries
Piracy	Unpredictable work assignments [pilots]			Death and suicide on board
Increased automation / mechanization of work	Increased paperwork due to MLC2006			Vain efforts to rescue crew members
Improvement in the navigation technologies	Low wages			Distrust
	Gender Discrimination regarding promotion			High level of leadership responsibilities
	Lack of confidentiality concerns			Lack of job security
	Poor safety climate and safety culture			Crew member hardly able to go ashore
	Lack of adequate training			Ports normally away from cities
	Uncaring work environment			Poor quality of life
	Healthy food clean water			Unsocial work hours
				Effort-reward imbalance / overcommitment
				criminalization

Table 1 depicts these various stressors in tabular form.

Wellbeing issues identified from literature review:

The following is a discussion of findings regarding wellbeing identified within the overall seafarer population. The issues are grouped into three categories however it should be noted that these grouping are somewhat arbitrary in that certain issues contain elements that would allow them to be classified into a different category. Nonetheless, the categorization scheme utilized appears useful to understanding the described wellbeing issues of seafarers. The three wellbeing issue categories are: (1) Physical, (2) Psychological, and (3) Personal / Lifestyle.

Physical:

There is a reported high prevalence of seafarers being overweight or obese. These conditions are associated with other wellbeing issues that have been identified from the literature that are physical in nature including high blood pressure, high cholesterol levels, metabolic syndrome, and cardiovascular disease. Peptic ulcers and gastritis have also been noted in the

literature. Joint and back pain have been reported, particularly among female seafarers. Rheumatological conditions as a result of accidents and other external causes have also been noted. Seafarers have a high prevalence of communicable diseases which is not surprising given that they live and work in close proximity to each other. The physical wellbeing issue that is likely the most prevalent and discussed the most in the literature is fatigue. Seafarers report having poor quality of sleep and sleepiness. Published articles have also noted cognitive dysfunction within seafarers due to fatigue.

Psychosocial:

Seafarers suffer from all the classic psychosocial wellbeing issues. There are reported high levels of anxiety and depression among this workforce. The literature notes that seafarers experience burnout as well as other general psychiatric disorders. And of great impact to the industry is the high rate of suicide which is likely underreported.

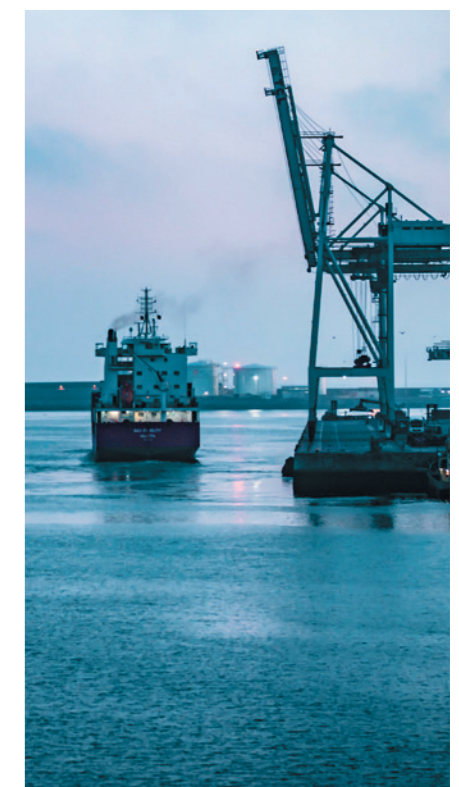
Personal / Lifestyle:

The literature identifies many personal or lifestyle wellbeing issues among the seafaring population. Published articles have described substantial rates of smoking, alcohol abuse and drug abuse among this population. It has been reported that approximately 30% of seafarers smoke tobacco, though others have reported up to 63.1%. Consumption of alcohol among seafarers has been estimated as low as 14.5% to 53.0%. One study found that cannabis was used by 3.4% of seafarers and that drug use was between 3 and 10%. All of these issues can not only have health impacts, but can also affect the ability of seafarers to perform the work safely. Unhealthy eating habits including poor dietary intake and malnutrition have also been noted in the published literature. Lastly, there is a reported reluctance among seafarers to obtain professional help for mental health issues. This may also be tied to organizational structures that may lead to alienation of the seafarer for seeking and/or receiving such services.

Table 2 depicts these various stressors in tabular form.

Physical	Psychological	Personal / lifestyle
Overweight / obesity	Burnout	Smoking
High blood pressure	Anxiety	Alcohol abuse
High cholesterol	General psychiatric disorders	Drug abuse
Metabolic syndrome	Suicide	Unhealthy eating habits / poor dietary intake / malnutrition
Peptic ulcers	Depression	Reluctance to obtain professional help for mental health problems
Gastritis		
Joint/back pain		
Cardiovascular disease		
Rheumatological conditions due to accidents / external causes		
High prevalence of communicable diseases		
Sleepiness		
Poor quality of sleep		
Fatigue		
Cognitive dysfunction (form fatigue)		

Table 2. Wellbeing issues identified from the literature



Recommendations identified from literature review:

The following is a discussion of the recommendations to improve seafarer health and wellbeing identified within the published literature. The recommendations are grouped into six categories however it should be noted that these grouping are somewhat arbitrary in that certain recommendations contain elements that would allow them to be classified into a different category. Nonetheless, the categorization scheme utilized appears useful to understanding the recommendations from literature with regard to seafarer wellbeing. The six recommendation categories are: (1) Physical, (2) Psychological, (3) Personal / Lifestyle, (4) Organizational, (5) Individual, and (6) Research.

Physical:

The published literature repeatedly recommended that shipping companies encourage regular physical activity. The promotion of sporting activities was recommended for seafarers while they are on board the ship and when they are at home. The creation of an exercise center as an area in which seafarers could work out was also suggested. A non-specific recommendation was to focus on methods to prevent musculoskeletal disorders as these not only have short term implications but and lead to long term issues, including incapacitation for the seafarer to work. It was also recommended that maritime companies prioritize the replacement of safety shoes based upon the condition of the outsole to reduce injuries due to slipping.

Psychological Health:

There were several recommendations with regard to maintaining the psychological wellbeing of seafarers. Some of these were relatively non-specific which would make them more difficult to operationalize. These included the recommendation to improve the work environment and the quality of life on board. One specific recommendation was to introduce anti-bullying and anti-harassment policies. The provision of mental health education and the creation, or strengthening, of prevention programs for psychological wellbeing were suggested. It was recommended that shipping companies provide professional counseling to resolve seafarer psychological difficulties. It was thought that seafarers should be provided training in coping methods for interpersonal contact/conflict to increase psychological wellbeing. One published article suggested the use of social media to disseminate health information to, and promote wellbeing of, seafarers.

Stressors that were noted earlier in this report included the relative isolation that seafarers undergo. One article included the recommendation that seafarers be screened for propensity for boredom and depression prior to embarkation. It also suggested that there be enhanced monitoring of these personnel while on board. The promotion of work arrangements that incorporate social support was also mentioned. Another suggestion within the psychological category was to increase the degree of decision making and latitude of crew members as this would change the job demand

and control relationship, which has been shown by Robert Karasek to be associated with stress. It was also recommended that a crisis intervention procedure be developed and put into place to help seafarers after experiencing extremely stressful situations.

The development and implementation of a maritime industry Employee Assistance Program (EAP) was recommended in one published article as the promotion of well-being including the provision of mental health counselling for seafarers should be an aim of all maritime stakeholders. No seafarer should struggle to get needed support for personal and work-related issues. In a competitive industry such as maritime, excessive cost has been cited as a reason that these types of programs are infeasible. Albeit some years ago, in 1990 the U.S. Department of Labor noted that for every dollar invested in an EAP, employers saved between \$5 and \$16. This large return on investment makes these programs extremely cost effective and raises the quality of life for the employees.

Personal / Lifestyle:

As with the psychological recommendations, the personal / lifestyle recommendations also included some relatively non-specific items. These included the recommendations to promote health and to reduce addiction, both worthy goals but without specifics. Other recommendations in this category were to reduce smoking, to reduce alcohol use, and to create interventions to reduce body mass index (BMI). A bit more specific were the suggestions

to run anti-smoking and anti-alcohol campaigns among seafarers. It was recommended that health promoting conditions on board be optimized with regard to behavior patterns including focusing on a balanced healthy diet and motivating seafarers to exercise. It was also suggested that the promotion of a diet containing less fat, sugar, and salt could be assisted through the incorporation of dietary assessment methods that perform menu analysis with new technologies such as a mobile based platform. Another recommendation was that shipping companies promote sleep hygiene, that is, minimize negative external stimuli. One other personal / lifestyle recommendation was that shipping companies advise seafarers on reducing exposure to UV-light. It should be noted that overexposure to ultraviolet radiation is associated with increased risk of skin cancer, premature aging and other skin damage, cataracts, and immune system suppression.

Communication:

It was recommended that shipping companies ensure all seafarers on board have a high level of fluency in the working language of the vessel. Furthermore, it was suggested that the companies have a system in place to ensure, and if necessary, improve, superiors' communication and leadership skills. The inclusion of a telecommunication system on board ships was recommended. As the purpose of this investment would be to allow seafarers to communicate with their families back home, it was also suggested that shipping companies support the home-based needs of the seafarer family for this type of communication.

Healthcare:

The literature recommended improving the medical services available to seafarers. More optimized medical treatment procedures on board are required. The use of telemedicine to access healthcare professionals, including physicians, is recommended as is improved access to land-based medical facilities. Telepsychiatry should be included within the telemedicine realm. It was also suggested that seafarers be provided access to health information while on board the ship. This could be provided through printed materials that are kept on board or, more desirably, through the internet. In any case, it is stressed that this information would need to be kept confidential to protect the seafarer's privacy.

The establishment of health surveillance programs for seafarers was recommended. One benefit of a surveillance program would be the identification of seafarers at increased risk of a significant health event such as a myocardial infarction. As an example, seafarers identified with high blood pressure could obtain onboard treatment thereby reducing the risk of a bad outcome for the seafarer as well as the risk of a costly diversion of the ship. An additional recommendation was to appropriately vaccinate the crew against disease.

Culture:

The overarching recommendation is that a culture of care needs to be developed within the maritime industry. As part of this paradigm shift to a more caring setting, the

work environment and the quality of life on board need to be improved. It was recommended that sympathetic management and intercultural leadership need to be put in place. This culture should include policies to encourage seafarers to obey safety rules and instructions and to be able to speak up without fear if they have concerns. Causes of perceived injustice at organizational and industry levels must be addressed, alongside supporting the capacity of individuals to cope with challenging situations. There needs to be a clear and effective complaint procedure with consequences for those who partake in bullying, harassment and workplace violence. Developing and implementing policies that encourage stable crewing are also recommended.

It was also recommended that shipping companies promote work arrangements that incorporate social support for the crew and their families. Social activities consistent with the culture of the seafarers on board should be promoted via masters and senior officers. Shipping companies should also help seafarers access welfare facilities, pastoral care, and health counseling while the ship is at port. There was also a recommendation in the literature that the circulation among crew members of materials reinforcing cultural and national stereotypes be minimized to the extent possible. It was suggested that shipping companies have an employee assistance program in place for seafarers that develop difficulties. Lastly, shipping companies should consider adopting a mentoring program for new cadets to help with their transition to the industry.

Work Demand:

There were various recommendations in the literature regarding reducing the work demand of the seafarer. Two of the more simplistic suggestions were to check staffing levels and, more specifically, to increase the number of crew. This would achieve the goals of another recommendation, namely, to mitigate the mental and physical burden of work on board the ship. It was also suggested to shorten the duration of stay on vessels, both in terms of duration of individual voyages as well as the total number of days per year. It is worth noting that total separation duration per year has been shown to be more important with regard to psychological issues than the duration of individual voyages. Another recommendation was to promote work arrangements that incorporate a high degree of decision making and latitude as a way of engaging the seafarer.

There were also recommendations that were more targeted at the work demand of seafarers in and around the port. It was suggested to reduce the number of terminals requiring cargo handling through improved scheduling. Targeted ergonomic and organizational measures to facilitate handling, porting loads, and the movement and transfer performed by crew members was also recommended, though these were not specific with regard to operationalizing the recommendations. Either simplifying administrative work performed on board during stays at port or transferring such duties to the land organization was also suggested.

Nutrition:

It was recommended that a healthy diet policy be encouraged at the shipping management level and include specifically designed programs to promote a healthy diet at sea. Proper water and food sanitation is required. The promotion of a balanced diet, containing less fat, salt, and sugar was also suggested. Lastly, there was a recommendation to incorporate subjective dietary assessment methods combining menu analysis with new, possibly mobile-based, technologies to assist in maintaining a healthy diet while on board the ship.

Fatigue:

There were two overarching topics regarding recommendations to reduce fatigue among seafarers. The first of these was to increase effective sleep. More specific recommendations included extending sleeping hours, promoting sleep hygiene, the creation of periods for unbroken sleep and rest. One article stated that measures should be taken to ensure that seafarers have adequate, uninterrupted sleep for avoidance of fatigue and depression. The use of Limited Wake Shift Work (LWSW) schedules was also recommended. LWSW schedules redistribute time-at-work into smaller aliquots that are spaced equally across the 24-hour period. One working definition of LWSW schedules are that they are fixed shift work schedules that occur for two or more consecutive days where individuals work for periods not exceeding 8 hours on rosters that allow for an average of more than one sleep period per day. It should

be noted that a 6 hours-on/6 hours-off schedule meets this definition but does not allow for a seafarer to be able to sleep for 7 consecutive hours which may be problematic. It has been reported that dividing sleep into periods scattered throughout the day and night, especially on a chronic basis, may have significant cognitive effects, in part due to a breakdown of the natural sleep architecture. Along the lines of adequate sleep, it was recommended that the availability of comfortable mattresses be prioritized.

The second overarching topic regarding recommendations to reduce fatigue among seafarers involved reducing stimuli that interfere with rest. It was recommended that accommodation and recreation areas be designed to reduce noise and vibration. Another published article included the suggestion that cabins be cool, protected from noise and vibration to the extent possible, and have an option to shield the cabin from daylight. Another included the recommendation to reduce noise in catering facilities on board the ship. Lastly, it was noted that seafarers should get enough recreational time and rest time to combat fatigue. The falsification of recorded work hours was an issue noted in the literature. There was a recommendation that there be a formal review of the methodology utilized including any checks and balances. With regard to contracts, it was recommended that work contracts be designed such that the ratio of work to leave time is no greater than 2:1. Other recommendations focused on continuous training of seafarers as their work environment is continually changing due to technological



advances. It was suggested that there be an intensification of education in the official onboard language as this has the potential to increase communication, reduce seafarer isolation, and reduce the likelihood of accidents.

Training:

The literature included a few recommendations regarding the training of crew members. These recommendations included that shipping companies ensure that there is appropriate training overall as well as for seafarer job-specific tasks. It was suggested that stress management and diversity training be integrated into the education of future seafarer masters and officers. Lastly, it was recommended that seafarers be informed about the adverse effects of exposure to excessive noise to their hearing and that they be instructed in the proper use of hearing protection devices.

A number of recommendations regarding training centered on health

care and health behaviors. Prevention messaging should be included during medical training courses for ship officers. The first aid education of crew members should be improved. Seafarers should also be educated regarding sexually transmitted diseases, HIV, and other health issues as there remains a lack of knowledge despite general availability of informational materials. An awareness campaign needs to be implemented to educate seafarers regarding the implications of misuse and overuse of antimicrobial medicines. Lastly, oral hygiene education and care need to be improved. Seafarers should be given complete information about correct oral hygiene protocols as well as the advantages to their wellbeing of maintaining a healthy mouth.

It was recommended that seafarers be trained in the handling of hazardous substances as well as in the proper use of personal protection devices. It was also recommended that food service staff be adequately trained so that they understand basic food hygiene, related pathogens, and

proper sanitation. This training for food service staff is especially important as lack of proper procedures can result in the entire crew becoming ill.

Individual:

The published literature also included recommendations specific to the individual seafarer as opposed to organizational level interventions. It was recommended that the seafarer be physically and mentally active during their awake hours. Additionally, seafarers should spend time in daylight, take breaks from work, nap, and stay hydrated. They should ensure that their schedule of duties is realistic. It was recommended that seafarers calm down as well as avoid caffeine and alcohol prior to sleep. Additionally, to the extent possible, they should follow their individual circadian rhythm. It was also suggested that seafarers adjust their mentality and look for happiness and satisfaction in their careers. Should they need it, seafarers should seek professional psychological counselling and help.

Other:

A few of the published recommendations did not fall neatly into one of the above listed categories. It was suggested that seafarers be allocated to single cabins. There was a recommendation to produce and distribute gender-specific information to all women seafarers regarding back pain, mental health, nutrition, and gynecological complaints. One published article suggested that leading international organizations concerned with the welfare of seafarers produce booklets and leaflets modelled on those produced by the Rotary Club of Melbourne South and the International Committee on Seafarers Welfare in languages used by most seafarers, for distribution on board all ships.

It was recommended that exposure assessments be performed, particularly for onboard chemical agents. This should dovetail with performing a risk assessment to identify hazards and the subsequent creation of a risk management plan. Along these lines, it was recommended that ship construction be enhanced to create safer work environments. One particular recommendation was to incorporate sufficient roughness in deck surfaces to reduce the risk of injury.

Other recommendations from the literature including ensuring that there is adequate ventilation of toxic fumes, instituting preventive measures targeted at reducing fatal injuries during mooring and towing operations, and adopting policies to ensure stable crewing,

One published paper recommended that awareness of wellbeing be considered in the next amendments of regulatory instruments. Lastly, as the number of medications required to be stocked onboard keeps increasing, it was recommended that a software system such as Pharmacy Ship be incorporated to help manage the ship pharmacy.

Research:

It should be noted that the literature noted that there was a lack of knowledge with regard to maintaining the health and wellbeing of seafarers. As such, many of the published papers recommended that research be conducted to fill in these gaps. It was suggested that research be utilized to better understand the psychosocial and cultural issues that exist in the industry. The effect of long-term demands associated with monitoring dynamic displays and maintaining situational awareness for extended periods of time on seafarer health and wellbeing should be studied. It was also recommended that the efficacy of the current legislative framework and industry's compliance be evaluated with regard to seafarer fatigue. Rest techniques, including power napping, should be studied to determine if they are appropriate and, if so, the most effective practices. The use of fatigue prediction tools and individual fatigue management systems should be evaluated. It is recommended that research into the optimal use of telemedicine as well as the most effective methods to train staff to safely and effectively provide care on board be undertaken. As far as nutrition, the food patterns of seafarers need to be studied and

potential interventions evaluated. The effects on seafarer wellbeing with regard to their family support and obligations needs to be better understood. With regard to maritime pilots, research regarding the impact of shift work on pilotage health and wellbeing should be undertaken as there are unique organizational and physical stressors among this population.

It is recommended that this research incorporate randomized controlled trials and longitudinal research methods as they are more able to determine causality than the cross-sectional studies that have generally been used to study seafarer health and wellbeing to date. Additionally, more qualitative research is recommended to better understand the concepts, opinions, and experiences of the seafaring industry.

Tables 3a, 3b, 3c, 3d, and 3e depict these recommendations in tabular form.

Table 3a.

Physical	Mental Health	Personal / Lifestyle
Onboard workers exercise center	Prevention programs should be strengthened to improve psychological wellbeing	Advise on reducing exposure to UV-light
Promotion of sporting activities on board and at home	Provide professional counseling to resolve seafarer psychological difficulties	Reduce smoking
Encourage regular physical activity	Provide training for: interpersonal contact, psychological quality	Reduce alcohol use
Encourage physical engagement	Screen seafarers for being prone to boredom and depression prior to embarkation and have enhanced monitoring of these personnel while onboard	Reduce addiction
Seafarers should be encouraged to take frequent, regular exercise	Mental health education	Anti-smoking and anti-alcohol campaigns among seafarers
Cruise companies should prioritize replacement safety shoes based on the condition of the shoe's outsole	Promote health	Interventions to reduce body mass index (BMI)
Prevention methods need to be focused on musculoskeletal disorders to reduce short and long term health issues	Establish measures for crisis intervention following extremely straining events	
	Provide timely psychosocial distress well-being services	
	Monitoring psychosocial distress status	
	Psychological health education	
	Health promotion on board program should be developed	
	Promotion of awareness around mental health in the workplace	
	Utilize social media to disseminate health information and promote mental well-being	
	Greater attention to psychological aspects of candidates during recruitment	
	Introduce and enforce anti-bullying and harassment policies	
	Develop and implement a maritime industry Employee Assistance Program (EAP)	
	Maritime organizations should invest in peer support programs	

Table 3a. Physical, psychological, and personal/lifestyle recommendations to improve the wellbeing of seafarers identified from the literature

Table 3b. Part 1

Communication	Healthcare	Culture
Electronic network equipment	Better medical services	Improve the work environment and quality of life on board
Support low-price telecommunications possibilities at home	Access to medical care in port	Broaden social interactions
Improve the superiors' communication and leadership skills	Provide controlled online materials to answer the health information needs of seafarers and their relatives	Obtain social support
Installation of shipboard telecommunication system to allow seafarers to contact their families and friends at home	Improve care for seafarers	Cultural entertainment activities
Private and inexpensive information technology and telecommunication	Better access to healthcare including more optimized medical treatment procedures on board and access to physicians via telemedicine	Promote work arrangements that incorporate social support
Improve to-shore telecommunications; reasonable cost and guaranteed privacy	Enhance onboard equipment to allow for high level of telemedicine	Develop policies to encourage seafarers to obey safety rules and instructions
Ensure high levels of fluency in the working language of the ship among officers and ratings	Establish health surveillance programs for seafarers	Underlying culture must be in place
Installation of shipboard telecommunication systems to contact family and friends	Identify seafarers at high risk of cardiovascular events during medical surveillance examinations	Causes of perceived injustice at organizational and industry levels must be addressed, alongside supporting the capacity of individuals to cope with challenging situations
	Onboard treatment of high blood pressure	Sympathetic management
	Vaccination of crew	Intercultural leadership

Table 3b. Communication, healthcare, and culture recommendations to improve the wellbeing of seafarers identified from the literature

Table 3b. Part 2

Communication	Healthcare	Culture
	Prevention measures directed towards the identification of specific groups of seafarers at high-risk of illness or injury	Promote social contacts on board at ports including shipboard sport events, accessible welfare facilities, pastoral care, health counselling
	Early treatment of isolation of seafarers with infectious respiratory diseases	Policies encouraging stable crewing
	Repeated bio-monitoring examinations during seafarer medical fitness tests	Promotion of social activities onboard via masters and senior officers
	Incorporate telepsychiatry for onboard use	Minimize the circulation of materials reinforcing cultural and national stereotypes
		Ensure availability of leisure activities
		Families of should be offered social support during seafarers' absence
		Employee assistance programs
		Clear and effective complaints procedures and measures against bullying, harassment and workplace violence
		Creation of a caring workplace environment
		Consider mentoring scheme for new cadets
		Health-promoting conditions on board should be optimized in terms of situation and behavior preventing.. balanced healthy diet, motivation to exercise
		Break down barriers associated with stigma of mental illness
		Employers need to dispel concerns about reporting mental illness
		A culture of safety needs to be established
		Creation of a team environment

Table 3b. Communication, healthcare, and culture recommendations to improve the wellbeing of seafarers identified from the literature

Table 3c. Part 1

Work Demand	Nutrition	Fatigue
Promote work arrangements that incorporate high degree of decision-making and latitude	Promote balanced diet	Extend sleeping hours
Favorable ratio of working to free periods (total separation duration per year is more important than the duration of individual voyages)	Diet containing less fat, salt and sugar	Avoid long working hours
Diminish the superiors' stress load caused by organizational duties	Incorporate subjective dietary assessment methods combining menu analysis with new technologies (eg., mobile-based)	Use of Limited Wake Shift Work (LWSW) schedules
Increase number of crew	Provide proper water and food sanitation	promote sleep hygiene
Targeted ergonomic and organizational measures to facilitate handling, porting loads and the movement and transfer done by crew members	Specifically designed programs to promote healthy diet at sea	reduce long working hours
Simplifying administrative work on board during stays at port or transferring such duties to the land organization	Healthy diet policy encouraged at the management level	Create periods of unbroken rest and sleep
Check manning levels		Watch system should be reviewed and possibly changed to give the crew member a longer continued period of sleep

Table 3c. Work demand, nutrition, and fatigue recommendations to improve the wellbeing of seafarers identified from the literature

Table 3c. Part 2

Work Demand	Nutrition	Fatigue
Shorten duration of stay on vessels		Designing accommodation and recreation areas to meet the needs particularly with regard to reducing noise and vibration
Reduce the number of terminals called at for the cargo handling through better scheduling		Reduce exposure levels to noise in all accommodation, recreational and catering facilities
Mitigate the mental and physical burden of work		Cabins need to be cool, protected from noise and vibration (to the extent possible), have option to shield daylight.
Cruise ship companies should hire shoreside labor to assist crew ship employees in dealing with portside luggage operations		Keep watch schedules fixed
Reduce length of contracts. Long contracts should be made shorter		Measures should be taken to ensure that seafarers have adequate, uninterrupted sleep for avoidance of fatigue and depression
		Better organization of working hours and work shifts for longer sleep periods
		Seafarers should get enough recreational time and rest time
		Review methodology utilized to record working hours
		Comfortable mattresses should be prioritized
		Contracts should be designed such that the ratio of work to leave time is no greater than 2:1. Additionally, there should be an upper work limit of 6 continuous months on board.

Table 3c. Work demand, nutrition, and fatigue recommendations to improve the wellbeing of seafarers identified from the literature

Table 3d. Part 1

Training	Individual	Other
Training of seafarers for job-specific tasks	Seek professional psychological counselling and help	Allocation of seafarers to single cabins
Inform seafarers regarding the adverse effects of exposure to excessive noise on hearing	Calm down and avoid caffeine and alcohol prior to sleep	Leading international organizations that are concerned with the welfare of seafarers produce booklets and leaflets modelled on those produced by the Rotary Club of Melbourne South and the International Committee on Seafarers Welfare in languages used by most seafarers, for distribution on board all ships
Instruct in the proper use of hearing protection devices	Spend time in daylight	Produce and distribute gender-specific information to all women seafarers regarding back pain, mental health, nutrition, gynecological complaints
Integrate stress management and diversity training in intercultural communication in the higher education of future superiors on board	Be physically and mentally active during the day, but not close to bedtime	Perform risk assessment to identify hazards and then prepare a risk management plan
Ensure appropriate training	Attempt to follow their individual circadian rhythm	Ensure adequate ventilation of toxic fumes
Continuous training as work continually changes due to technology advances	Take a break	Perform exposure assessment of onboard chemical agents
Instruct seafarers in safe behavior onboard	nap	Enhance ship construction to create safer work environments. Incorporate sufficient roughness in deck surfaces
Intensify education in the official onboard language	drink (water preferred)	Integrate ergonomic information and organization aspects with that on health and impairment
Include prevention messaging during medical training courses for ship officers	eat (something light)	Better registration of both ship and crew member near accidents
Incorporate ongoing training on safe handling of hazardous substances and proper use of personal protection devices	Ensure schedule of their duties is realistic	Facilitate access of seafarers to port welfare facilities

Table 3d. Training, individual, and other recommendations to improve the wellbeing of seafarers identified from the literature

Table 3d. Part 2

Training	Individual	Other
Improve first aid education of crew members	Adjust mentality, look for happiness and satisfaction in their careers	Create policies that encourage stable crewing
Incorporate fatigue management training and information campaigns		Shore leave should be provided at every opportunity and for all ranks
Improve oral hygiene education and care. Seafarers should be given complete information about correct oral hygiene protocols and dental hygiene as well as the advantages for their health of keeping a healthy mouth		Awareness of the concept of wellbeing need to be considered in the next amendments of regulatory instruments
Implement an awareness campaign to educate seafarers regarding the implications of misuse and overuse of antimicrobial medicines		To reduce occupational injuries, the working environment and the quality of life on board need to be improved, mental and physical burden of work need to be mitigated, and policies developed to encourage the seafarer to obey safety rules and instructions
Food service staff should be adequately trained and should understand food hygiene, related pathologies, and sanitation		Preventive measures should target fatalities during mooring and towing operations
Officers should undergo diversity training to reduce the level of stress onboard		Incorporate a software system such as Pharmacy Ship (acronym: PARSI) to manage the ship pharmacy
Educate seafarers regarding sexually transmitted diseases, HIV, and other health issues as, despite the general availability of information materials, there remains a lack of knowledge		

Table 3d. Training, individual, and other recommendations to improve the wellbeing of seafarers identified from the literature

Table 3e. Part 1

Research		
Effect of long-term demands associated with monitoring dynamic displays and maintaining situational awareness for extended periods of time impairs health and well-being	Determine the most effective ways in which a just, inclusive, and supportive work environment can provide a good platform upon which more individually focused positive psychology interventions at sea can reap benefits	Determine the Return on Investment of Employee Assistance Programs in the maritime sector
Randomized controlled trials	Shift ergonomic research from physical to organizational factors	Develop evidence based methods to assess the occupational risks to dental health and to then develop interventions
Longitudinal studies	Determine the role of working conditions on psychological well-being, quality of life, and burn-out syndrome	Determine if most of the musculoskeletal disorders, accidents, injuries, and mood disorders at the origin of unfitness for work at sea are truly work-related
More qualitative research	Determine the most effective way to incorporate self-report measures of fatigue	Determine prevalence of self-medication among seafarers of antibiotics
Addressing the context for non-European seafarers	Standardization of fatigue measurement tool	
Seafarer spouses and family supports and obligations	Effect of social support on maritime pilot well-being	
Psychosocial and cultural issues	Standardization of perceived stress measurement tool	
Telehealth	Longitudinal analysis of shift work on seafarers health and well-being	
Most effective way of training staff to safely and effectively provide care on board	Focus research on mariners from current seafaring countries	
Evaluate efficacy of current legislative framework and industry's compliance with regard to fatigue	Identify differences in approach to safety between South East Asian and European seafarers. Determine methods to implement the positive attitudes in accident prevention programs	

Table 3e. Research recommendations to improve the wellbeing of seafarers identified from the literature

Table 3e. Part 2

Research		
Assess potentials for fatigue prediction tools and individual fatigue management systems	Evaluate the exact role of weather conditions, hours of sleep/standby/duty, and correct functioning of safety equipment on the occurrence of accidents among marine pilots	
Test rest techniques such as power napping	Explore effectiveness of stress-prevention strategies	
Study eating patterns of seafarers and determine its impact on physical requirements	Implementation of an ecologically valid and theoretically rich translational perspective to determine the sources of stress and the consequences of stressors for the individual and the organization. Determine the mediating/moderating effect of individual personality and behavior on these consequences	
Investigate plausibility and subsequent benefits of napping while on-shift	Develop and validate an instrument to measure stressors	
Assist in examination of workplace policy on the impact of shift work on pilotage health and well-being	Conduct longitudinal research on effects of stressors on physical health and well-being of seafarers	
Longitudinal analysis of shift-cycle on pilot health and well-being	Measure changes in basic physiological parameters while onboard	
Conduct multidisciplinary studies	Evaluate the effect of different coping strategies for occupational stressors	
Conduct research on the use of communication technologies and medical applications to improve telemedicine services at sea	Evaluate effectiveness of psychoneurobics training on physical and mental health	

Table 3e. Research recommendations to improve the wellbeing of seafarers identified from the literature

Practices employed and/or studied:

Several different interventions have been put into practice by shipping companies to increase the health and wellbeing of seafarers. The amount of discussion regarding the interventions put into place including the methods employed for their implementation, the willingness of seafarers to embrace the interventions, and the evaluation of the effects of the interventions are limited. The various interventions tended to target different factors with regard to seafarer wellbeing. These included, work demand, mental health, lifestyle, stress management, and work satisfaction.

With regard to work demand, a total of 12 different interventional studies of maritime workers evaluated the effect of shift work on fatigue and performance. These interventions evaluated different limited wake shift work (LWSW) schedules. Overall, the results revealed that a 4 hours-on / 8 hours-off schedule was the most promising with regard to maximizing sleep. They suggested likely benefits to reducing seafarer sleepiness as well as improving their performance. It should be noted that a 4 hours-on / 8 hours-off schedule is problematic as it would likely require additional crew which is financially problematic.

Several lifestyle interventions were reported in the literature. One intervention was entitled the Cooking Course. A two-day cooking course on healthy diet was targeted to all chefs and crew members with cooking responsibilities from two shipping companies. The first day of the intervention consisted of

an introduction to a healthy diet, methods to improve nutritional value in everyday dishes, and a practical task of preparing recipes from the "Food at Sea" cook book. The second day of the intervention consisted of imparting motivation and communication skills. After one year, a significant change in eating behavior was reported. The self-reporting noted that, on average, the seafarers ate healthily on more days of the week than they had prior to the intervention.

Another lifestyle intervention was conducted among four Finnish shipping companies. The participants included 730 seafarers from four cargo ship and two passenger-cruise ferries. The intervention consisted of informational lectures concerning healthier eating habits at which time meals were given. Courses on shore were arranged to improve seafarer physical fitness and to increase their resting benefit between periods at sea. The health promoting activities were targeted to those seafarers at need. Additionally, anti-smoking and anti-alcohol drinking information was given to the seafarers. After one year, the seafarers were reported to have increased their exercise frequency both on board the ship and on shore. The seafarers that increased their physical exercise more often reported their health and working ability to have improved than those seafarers that did not change their exercise habits.

A third intervention regarding the lifestyle of seafarers was conducted in concert with two Danish shipping companies during the 2008 and 2009. It utilized a one-year pre-

post research design. The lifestyle intervention included healthy cooking courses for ship cooks, improvement of fitness facilities on board, and health education interventions. The health education interventions included smoking cessation courses, individual exercise guidance, and extra health checkups for the seafarers. After one-year, there was a reported increase in seafarer level of fitness. Additionally, there was a reported decrease in daily sugar intake and metabolic syndrome.

As mentioned above, this same study included interventions to reduce the number of seafarers that smoked tobacco. The results of this study as well as four other studies that included interventions to try and reduce tobacco and alcohol consumption among seafarers showed minimal to no effect. Pharmacotherapy revealed no improvement over that of a control group. In total, interventions to reduce tobacco and alcohol use were not effective.

Two projects were undertaken to try and improve the mental health of seafarers. The Rotary sponsored the first entitled "The Mental Health of Seafarers" created print material containing information on depression. No other mental health issue was included in the printed media. The material was distributed to Masters and non-rated officers. The printed material contained a hotline telephone number that was staffed 24 hours a day, seven days a week by call centers. Other information included in the printed media was: (1) a checklist to identify someone who is depressed, (2) a section to help

understand depression, (3) how someone with depression can be helped, and (4) methods to reduce stress. It has been reported that the project has been successful however it is unclear as to what that actually means.

A second project was sponsored by International Committee on Seafarers Welfare in which they created booklets entitled "Guidelines for the Mental Care of Seafarer's Onboard Merchant Ships". The material included in the booklets covered a variety of topics. These included: (1) Risks for seafarers, (2) Stress, (3) Harassment and bullying, (4) Anxiety, (5) Depression, (6), Fatigue, (7) Disruptive thinking and behavior, (8) Addiction to alcohol and drugs, (9) Mental care onboard, (10) Tips for the successful implementation of a mental care campaign, and (11) Where to find advice. Like the project sponsored by the Rotary, it has been reported that this campaign was successful but it is unclear as to what that actually means.

Shell Health professionals created the Shell Health psychosocial program which is a resilience program with a goal to support the thriving of employees both on- and off-shore. The voluntary program was piloted in 2014 with an intervention group consisting of 21 vessels, half of its fleet. The intervention consisted of the following twelve psychosocial program modules: (1) Introduction: What is resilience?, (2) Take care of yourself, (3) Make connections, (4) Avoid seeing crises as insurmountable problems, (5) Accept that change is part of living, (6) Move towards your goals, (7) Take decisive

actions, (8) Look for opportunities for self-discovery, (9) Being grateful can accomplish more, (10) Nurture a positive point of view of yourself, (11) Keep things in perspective, and (12) Maintain a hopeful outlook. Officers acted as facilitators of the modules, each of which are 40-60 minutes in duration. It was determined that the on-board psychosocial program may have provided a psychological buffer that countered the impact of duration on board on perceived stress. A challenge of incorporating this type of program onboard is the staggering changeover of crew. To alleviate this issue, a peer-to-peer training scheme was utilized whereby officers trained other officers onboard so that if a trained facilitator disembarked, the program would still be able to continue.

In 2010, a partnership between South Africa, ITF Seafarers Trust and the Cape Peninsula University of Technology (CPUT) developed the Seafarers' Wellness Programme as a multi-dimensional, holistic, and person-centered approach to training in the maritime industry. In 2014, Sailors' Society adopted the program and entitled it Wellness at Sea. Although the program has been introduced over a decade ago, no published literature on implementation issues, effectiveness, nor return on investment was located.

Metabolic syndrome is a cluster of co-occurring conditions that increase the risk of heart disease, stroke and type 2 diabetes. These conditions include increased blood pressure, high blood sugar, excess body fat around the waist, and abnormal cholesterol or triglyceride levels. A

decade ago, a study by Pedersen and Jepsen (2013) revealed that 24.2% of Danish seafarers had the presence of metabolic syndrome. These seafarers underwent an intervention that consisted of three parts:

1. Through flyers and posters, the participating seafarers were informed about metabolic syndrome, the related risk factors and its health effects,
2. Individuals with metabolic syndrome were given advice relating to treatment of e.g., hyperlipidemia, hypertension and diabetes when need, and
3. Individuals with metabolic syndrome were advised about preventive measures (10% weight-reduction, physical activity greater than a half an hour per day, reduced intake of saturated fat, increased content of fibers, smoking cessation, and controlled intake of alcohol).

The intervention was only given at baseline. Two years later, 26.5 % of participants were diagnosed as having metabolic syndrome. Therefore, in spite of the intervention, the prevalence of metabolic syndrome increased within this group of seafarers. This implies that an individual health promotion program may be inadequate and there appears to be a role for corporate systemic actions.

Human factors rather than mechanical factors are the cause of most fatal accidents. Major antecedents include unsafe working practices, negligence, flawed perception of risk, and inadequate training. Important measures include training

and combining new crew members with more experienced seafarers. Maintenance of sensors and controls including oxygen and hazardous atmosphere sensors for entry into enclosed spaces and, for navigation, electronic chart display information systems in combination with global positioning systems, and bridge navigational watch alarms.

Barriers to implementation:

Numerous barriers to implementation of interventions to improve the health and wellbeing of seafarers have been described in the literature. First and foremost is cost. Limited Wake Shift Work schedules redistribute time-at-work into smaller aliquots which are evenly spaced across a 24-hour period. Commonly used Limited Wake Shift Work schedules include 4 hours-on/8 hours-off and 6 hours-on/6 hours-off. These shift schedules minimize consecutive hours at work, promote opportunities for rest between working shifts, and allow all workers at least some opportunity to sleep during nighttime. The use of Limited Wake Shift Work schedules, however, would increase the number of crew per ship. Thus, there would be increased cost for salaries as well as all the other costs associated with feeding and caring for a seafarer. As the shipping industry is very competitive, unless all shipping companies were to increase crew sizes, those that did would be a competitive disadvantage. The only likely method to have all shipping companies increase crew sizes would be to mandate it through regulation, something that appears to be very unlikely.

The ability to reduce noise and vibration in cabins, as well as in recreational and catering facilities on the ship would require design changes in the ship building process. It would, therefore, require additional design and construction costs. Although not a reason to pass on redesigning ships, it would be years until these improvements would reach the maritime workers. It is also likely that to try and redesign or retrofit current ships to reduce the noise and vibration would be cost prohibitive. Along this same line of thought, the creation of an exercise center on board the ship would have similar barriers, though possibly to a lesser degree.

Without the ability to increase the crew size, combatting fatigue will remain a challenge. Currently, the focus is on prescriptive hours of work and rest as described by the International Maritime Organization and the International Labour Organization. There is an expectation that seafarers are responsible to manage and tolerate fatigue as part of their working life at sea. It is, as such, an individualistic approach to managing fatigue. This approach will continue to have difficulties as some seafarers, due to the work schedules, will not be able to consistently get at least seven hours of continuous sleep. Additionally, circadian rhythms are often not embraced due to the 24-hour, seven day a week operation of the ship. Another issue that has some negative effect upon fatigue is the crossing of time zones, a fact of life in shipping that is unchangeable.

Proper nutrition has its own barriers. Fruits and vegetables are relatively expensive and therefore, increasing them in the diet would have a resultant increase in the cost of feeding the crew. Another issue is that many seafarers like the current high fat, high sugar, high salt diet as ascertained from the Seafarer Nutrition Study. The Seafarer Nutrition Study conducted in 2014 and published in 2018 ("Food offerings on board and dietary intake of European and Kiribati seafarers – cross-sectional data from the seafarer nutrition study", Zyriax et al. In fact, large portions of food is considered by some to be one of the benefits of working on a ship. Thus, not only is there an organizational barrier, there is also an individualistic barrier.

Round tables:

Two round table discussions were held virtually, the first on June 29, 2021 and the second on July 15, 2021, with the goal of having shipping company representatives discuss interventions that they deemed to be both possible and worth doing in terms of addressing the long-term risk factors affecting the psychological wellbeing of seafarers. These round tables were the coordinated effort of Lloyd's Register Foundation, Seafarers Hospital Society, and Yale University. Risk factors were grouped in four general topics, namely, interpersonal factors, training, living conditions, and work demands. The ultimate goal of the round table discussion was to produce a prioritized list of interventions that would allow recommendations from research regarding seafarer wellbeing to be translated into action.

An additional two virtual round table discussions were held, the first on September 1, 2021 and the second on September 2, 2021. These round table discussions were also a coordinated effort between Lloyds Register Foundation, Seafarers Hospital Society, and Yale University. The conduct of these sessions mimicked those of the initial two round table discussions however this time the participants were representatives from NGOs, trade unions, and regulatory bodies.

The results of these four round table discussions are discussed below. The sessions were found to revolve around twelve different topics within the realm of methods to increase the wellbeing of seafarers. These twelve topics were:

1. Crew size,
2. Bureaucracy,
3. Culture of care,
4. Evidence and causation,
5. Training,
6. Food and water,
7. Accommodation,
8. Recreation,
9. Contract length and timely relief,
10. Bureaucracy and fatigue,
11. Ship-shore communication and relationship, and
12. Job satisfaction.

Crew size:

Crew sizes on comparable vessels were reported to be similar among different shipping companies. Although increasing crew size could help alleviate some of the work demand and psychosocial stressors on seafarers, the financial burden of increasing crew size

makes this option unrealistic without regulation. Several flag states block votes relating to safe staffing when such issues arise at the International Maritime Organization, the United Nations specialized agency responsible for the safety and security of shipping. Thus, it is unlikely crew sizes will be increased.

Bureaucracy:

Bureaucracy has led to increasing demands upon the crew as additional responsibilities are added without removing any of the previous requirements. One source of this increased work demand is the incomplete transition to digitalization. Another is the huge increase in the documented requirements for Masters as there are now approximately 20,000 pages of written requirements. Despite this increased work demand, ship accidents have been decreasing over the past two decades, likely a result of seafarer resilience. It was noted, with some dread, that the day is coming where the seafarers' cognitive limits would be reached. The group did not believe that this trend of increasing regulation was going to change.

Culture of care:

The participants in the round table discussion felt that a "culture of care" overlaps with that of "just culture" which had been implemented by companies to replace "no blame culture". A "culture of care" needs to incorporate the notion of psychological safety which generally refers to an environment where employees feel safe to ask

questions, bring up concerns, and just be themselves without fear of humiliation or punishment. "Culture of care" is a holistic approach to the work environment that goes beyond occupational health and safety by incorporating the whole package of benefits and support to seafarers and their families. Employees are looked at as an important part of the organization and their health and wellbeing when they are onshore is just as important as when they are onboard the ship. After all, if they get sick or ill at home, or if they get sick or ill onboard the ship, they still will not be able to work.

A paradigm shift is required in the maritime industry to view seafarers as an integral part of the organization and not just a route to profit. It was acknowledged by the group that "not caring could cost billions". It was also believed that care can not be regulated. Rather, it must be developed and nurtured by the organization. Care has to be a long-term, authentic and consistent practice at all levels of the organization. This includes top management, shoreside staff, as well as the crews onboard. The training of employees to understand the benefits of diversity and how to recognize when a crew member needs support is fundamental.

A "culture of care" will yield social interactions and crew cohesion. It will lead to trust among all, not just among the crew but between the crew and the shoreside personnel as well. It will lead to a sense that others care for you and have your back.

Evidence and causation:

It was deemed important by the group that crew wellbeing needed to be measured in order to identify and address onboard issues. Measurements should not be a one-time activity, but rather continuous to monitor temporal changes. Some of the meeting participants expressed a desire to share information including best practices with other companies. There were also some expressed wishes to be able to combine anonymized data from various companies to understand industry trends regarding seafarer wellbeing. It was discussed that data could be compiled and analyzed by a third party such as an academic institution.

Training:

The group agreed that mental health training was important, but acknowledged that due to the potentially sensitive nature of such training, prior to taking part in the training, each employee must first give their consent. The represented companies that provided mental health training reported positive feedback. It was suggested that existing first-aid courses could add a brief section on mental health terminology and signposting as an awareness exercise. It was noted that mental health training is not a one-time exercise but, rather, an ongoing practice built into the culture of the company. There was a belief that although "Safety First" is spoken, it is not practiced. There was concern regarding the training of ship safety officers in that there appears to be a lack of understanding as to how health and safety is incorporated.

Another concern was expressed that seafarers are already fatigued from the training they receive when they start. Thus, if additional training is to be implemented, it will be necessary to either increase the efficiency of the training exercises or prioritize those found to be most useful and effective.

Food and water:

There was consensus among the participants that drinking water should be made accessible where needed onboard the ship and that providing high-quality and varied food that was culturally appropriate for the crew was important and easy to implement. Crews should be pro-actively encouraged to drink more water. The nutritional value of the food onboard ships should be reviewed by catering managers.

Accommodation:

There was much agreement that accommodation standards for the crew have declined over time and that cabins were less inviting. It was suggested that this lack of prioritization of living space was due to increasing commercial pressures. It was noted that there is a mismatch in standards between officer and rating accommodation. It was also noted that there has been a tendency in the large container ships to have the officer accommodations forward and the ratings accommodations aft, thus creating a physical separation. This is counterproductive to ship cohesion. The question as to whether cabins should be shared or not was discussed with some believing privacy was important while others saw sharing as a way

of increasing social support. The sharing of bathrooms, however, was deemed undesirable.

As cabins are where seafarers sleep and get rest, it was noted that good ship design can reduce levels of noise and vibration. Both of these are stressors that result in poor sleep quality and increased fatigue. There was uncertainty as to the degree of control that the crew have with regard to the heating/cooling of cabins as well as the level of light.

Recreation:

The group believed that with proper design, ships can have facilities that allow for exercise and communal activities, both of which are considered to be of value by seafarers. It was noted that some companies provide gyms, basketball nets, karaoke machines and DVD's. It was noted that even among ships equipped with excellent recreational facilities that seafarers do not make use of them. As a result, the crew no longer has to get to know each other. The "togetherness" of the crew is lost. Managing internet access was also mentioned as a vital fostering of social interaction onboard though it should be noted that internet access was consciously not a focus of these round table sessions.

Contract length and timely relief: There was much discussion regarding contract length. It was acknowledged that length of service varies by vessel type as well as other factors. It was discussed that some seafarers would like shorter contracts while others prefer longer ones as that allows them to maximize earnings. Research

has shown that seafarers' wellbeing declines with increased contract length. That led to some participants suggesting that contracts be no more than nine months in length, down from the 11-month maximum set by the Maritime Labour Convention. The group discussed that ship owners, charters, and ports all have agency in setting a standard for contract length. Of particular concern was the "no crew change clauses" in some contracts. There was also agreement among the round table participants that seafarers should be told the margin in which their length of service may vary and be kept informed of changing conditions.

Bureaucracy and fatigue:

It was noted that increasing bureaucracy is a risk factor with regard to seafarers' psychological wellbeing. Ship Management Systems are becoming unmanageable as more requirements are added without any items being removed. At some point the cognitive overload will be reached with potential catastrophic results. The group suggested that the bureaucratic burdens, including paperwork, be automated and/or moved to shore whenever possible. It is vital that Masters be allowed to 'stop work' when they deem it necessary for the safety and wellbeing of the crew.

Shift work was discussed as a predictor of fatigue. In particular, it was noted that 12 hour shifts are difficult and often result in seafarers consuming large amounts of energy drinks, such as Red Bull, to be able to cope with the demands to keep themselves going. Watch keeping

schedules that incorporate a six hours on, six hours off schedule does not allow seafarers to get necessary rest. One participant argued that a "6-on, 6-off" schedule should be banned.

It was noted that working hours and demand were not the only cause of fatigue and that unlimited WiFi also contributes to seafarer fatigue. It was deemed important the crew members be reminded of the importance of sleep and rest. Additionally, crew members need to be trained to recognize the symptoms of fatigue in themselves and to be able to inform senior officers that they are not fit for duty. This should be valued as a part of a "culture of care" and not looked down upon as an individual weakness.

There was also discussion that shoreside workers need to understand the work demands and constraints of work on the ship. Likewise, the reverse is also true. Having the larger picture will allow for more cohesion throughout the shipping company.

Ship-shore communication and relationship:

Generally, it was felt by the participants of the round tables that the maritime industry lacks the developed Human Resources Management approach for ship staff that is established ashore. One participant identified a need to engage officers and crew in "the enterprise" so that they could understand the perspective of those working on shore. As noted above, though, engagement needs to be a two-way street and this will only come from improved connectivity. It

was thought important that office staff spend time onboard vessels.

Increased connectivity was also described as reducing the Master's autonomy with the potential advantage of reducing reliance and pressure on the Master as decision making becomes more shared. Again, for this to work effectively, clear communication between the ship and shore is a necessity.

Job satisfaction:

It is important that seafarers feel that their company is not only concerned about them but that this concern extends to their family. Providing relevant family activities and support are important company functions. Another method of showing this concern is ensuring good communication between all relevant parties, ship management, seafarers, and the families of the seafarers. A Key Performance Indicator (KPI) of job satisfaction is retention. This metric should be monitored by shipping companies and action taken when the retention levels fall below 90%.

The annex to this report includes more extensive summaries of insight from the aforementioned round tables with shipping company representatives that was prepared by Dr. Olivia Swift of Lloyd's Register Foundation.

Gaps in the Literature

There are significant gaps in the literature with regard to the health and wellbeing of seafarers. These gaps are effectively delineated in the recommendations for research section of this document. Most

notably, the lack of longitudinal studies that follow seafarers over the course of their career are needed to understand the causal relationships between demographic, psychosocial, environmental, and occupational

factors with regard to the wellbeing of seafarers. These types of studies will allow risk factors of acute and chronic conditions to be identified. They also are essential to understanding the effectiveness of interventions.

Conclusions and Recommendations

The literature has identified a substantial number of stressors that may affect the health and wellbeing of the seafarer population. The stressors can be placed into the following five categories: (1) Work environment, (2) Organizational, (3) Cultural, (4) Physical, and (5) Psychosocial. Exposure to any stressor within any of these categories can have an adverse effect upon seafarer wellbeing. Unfortunately, the literature supports the belief that seafarers are often, if not chronically, exposed to a multitude of these stressors.

There is substantial literature describing the health and wellbeing of seafarers. There appear to be three overarching constructs under which issues relating to seafarer health and wellbeing can be broadly grouped, namely, (1) Physical, (2) Psychological, and (3) Personal / Lifestyle. The literature is rich in describing issues experienced by seafarers in each of

these domains. As with the stressors mentioned above, seafarers have high prevalence of health and wellbeing issues related to these domains and many have more than one issue concurrently. Of note, overall, the seafaring population has relatively poor mental health compared to land-based workers with high levels of depression, anxiety and suicide ideation. Lefkowitz and Slade, 2019: Prevalence of depression in the seafarers, as measured by the PHQ-9, was found to be significantly higher than that observed in other populations using the same survey questions: 25% as compared with 6% in a German general population and 5% prevalence among oil and gas workers. Prevalence of anxiety (17%) and suicidal ideation (20%) was also notably high.

Additionally, they are working in harsh, isolated environments that often require physical effort. There are also lifestyle choices that are problematic.

These include unhealthy eating habits, lack of exercise, tobacco smoking and higher than desired alcohol consumption.

There are many recommendations for improving the wellbeing of seafarers. These recommendations can be grouped into six categories: (1) Physical, (2) Psychological, (3) Personal / Lifestyle, (4) Organizational, (5) Individual, and (6) Research. With regard to the first five of these categories, there are specific suggestions, some that would almost immediately improve the wellbeing of seafarers. For instance, nutritional interventions such as a two-day cooking course on healthy diet targeted to all chefs and crew members with cooking responsibilities or ensuring seafarers are properly hydrated will almost immediately result in health benefits. Simplifying administrative work performed on board during stays at port or

transferring such duties to the land organization would immediately start to reduce stress associated with high work demands. On the other hand, reducing noise and vibration in areas where the crew sleep, rest, or recreate, could take a much longer time to accomplish thereby delaying their benefit to the wellness of the crew. One overriding factor that can not be ignored regarding many of the recommendations is that they will require investment from the organization in terms of effort and cost. Ultimately, the creation of a "culture of care" would require a paradigm shift such that the crew are integral to the business model and that they need to be valued.

Although many recommendations for improving the health and wellbeing of seafarers have been published, the literature contains relatively few interventions that have been put into practice by shipping companies. The various published interventions tended to target different factors with regard to seafarer wellbeing, notably, work demand, mental health, lifestyle, stress management, and work satisfaction. Overall, the description of methodology and reported results are often less than hoped in order to ascertain the effect of the intervention as well as its generalizability to the larger maritime workforce. It is recommended that those that commission as well as those that conduct research include impact analysis protocols within the methodology of their pilot studies.

There are numerous barriers to the implementation of interventions to improve the health and wellbeing of seafarers. Many of the systems employed by the maritime industry

have been utilized for decades or longer and seem rooted in their DNA. With this much inertia, change is difficult and requires strong organizational commitment. There are upfront costs associated with implementing, and in some cases, on-going costs to maintain, interventions. These costs can make it harder for shipping companies to compete in the short term, though may significantly reduce cost in the long term. It appears that certain recommended interventions, such as increasing the size of crews, will only occur through regulation, however, it appears in today's environment that this sort of regulation is not forthcoming.

The round table discussions were very informative as the participants were willing to express their viewpoints. Overall, the discussions mirrored the available literature with regard to the wellbeing of seafarers, the potential upside of affecting change, as well as the associated barriers. The participants tended to agree that additional research is needed to determine the effectiveness of different interventions as well as to share learned knowledge across the industry.

In conclusion, there is great potential to increase the health and wellbeing of seafarers and, in particular, the mental health of this population. There is low hanging fruit such that some changes could be made quite quickly and with little expense or disruption to current practices and, yet, be expected to substantially increase the life of the seafarer.

It is recommended that a "culture of care" is embraced by the maritime industry. This "culture of care"

is not only about caring for the seafarers, but extends to caring for the organization, caring for society and caring for the environment. A "culture of care" can be a core element leading to decent work wherein employment "respects the fundamental rights of the human person as well as the rights of workers in terms of conditions of work safety and remuneration...respect for the physical and mental integrity of the worker in the exercise of his/her employment"¹. As a "culture of care" is adopted, seafarer wellbeing and job satisfaction will improve and retention rates should increase. This will allow for the corporate knowledge to be retained while reducing the high cost of training new employees and reduce learning curves during which there are high probabilities of accidents and injuries. Although it needs to be looked at as a long-term investment, a paradigm shift to a "culture of care" will ultimately improve the lives of seafarers and their families while reducing operating costs; a win-win opportunity.

It is also recommended that the work required to make this shift to a "culture of care" a reality, which is the ultimate goal, will require all stakeholders in the maritime industry to work as a partnership. With this in mind, I am personally asking these stakeholders including shipping companies, crewing agencies, chartering companies, P&I clubs, and charities to join with us in this endeavor. This will provide more than a window into research, but will include all as partners into the research and implementation of interventions to improve the health and wellbeing of seafarers; a truly noble goal.

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Annex: Preventing poor mental health among seafarers in the long-term: identifying impactful, implementable action

Summaries of insight from round tables with shipping company representatives 29 June & 15 July 2021

Introduction

Research provides a good understanding of what seafarers want and need in terms of keeping well, psychologically, but we hear less from the company perspective. These round tables were specifically for shipping companies to speak frankly – under Chatham House rules – about what they deem to be possible and worth doing in terms of addressing the long-term risk factors affecting seafarers' psychological wellbeing. The risk factors were grouped around four umbrella topics (interpersonal factors, training, living conditions, work demands) – each of which breaks down into specifics which were collated from the recommendations that have come out of the leading research on the topic. The aim is for the round tables to produce an 'index' (a prioritised list of actions) of what is possible and most impactful, to help move the research recommendations into action for long-term change. Additionally, participants were invited to share insight into what companies have learned through experience thus far, in relation to the different topics. This report provides a summary of the four break-out conversations and is primarily for participants to have a record of those conversations. Please do not share the report beyond the organisations involved.



Related resources of interest

- <https://www.seafarerswelfare.org/our-work/mentally-healthy-ships>
- <https://www.ukchamberofshipping.com/latest/practical-guidance-shipping-companies-improving-mental-wellbeing/>
- <https://www.intertanko.com/info-centre/intertanko-guidance/guidancenotearticle/crew-welfare-management-and-mental-wellness>
- <https://www.lrfoundation.org.uk/en/news/improving-safety-climate-by-tackling-mental-health/>
- <https://ungc-communications-assets.s3.amazonaws.com/docs/publications/Maritime-Human-Rights-Risks-and-the-COVID-19-Crew-Change-Crisis.pdf>

29 June & 15 July round tables: breakout group 1 – interpersonal factors and training

The following questions were provided as prompts. It was acknowledged that responses will vary dependent on ship type, size, age, route, etc.

Breakout 1: risk factors relating to interpersonal factors and (lack of) training

Interpersonal factors:

- Is there any scope for upping crew size? A naive question but minimal crewing is the root of so many issues...
- What does a 'culture of care' mean to companies and how have they tried to nurture it?
- What methods have been employed to improve communication vertically (hierarchically) and horizontally (between peers)?
- Are there procedures to attenuate and/or handle conflicts between crew members?
- How have companies addressed bullying, harassment? Including exposure to threats and violence, and discrimination. What do they see as the root causes?
- Psychological safety is defined as having the ability to express oneself without fear of negative consequences. Have companies addressed this and if so, how?
- Have companies attempted to help seafarers understand cultural difference in order that related problems are minimised and opportunities maximised?
- There is a body of evidence that demonstrates increased risk of suicide connected to extended voyages. How is this risk being monitored and addressed?

Breakout 1: risk factors relating to interpersonal factors and (lack of) training

Training:

- Lack of mental health training has been identified as a risk factor. How much of a priority is addressing this for your organisation? If a priority...
- What training relating to mental health have you tried? Who is that geared towards (e.g. all seafarers/senior crew/cadets/new recruits, etc.)?
- What's worked/hasn't worked? Are you evaluating and if so, how (briefly)?
- Are you aware of MCG's Mental Health Awareness and Wellbeing Training Standard? Any feedback?
- Have you a view on whether such training should be mandatory?

Crew size

- The groups reported consistency in crew size between different companies' comparable ships and a reluctance for any one company to be at a financial disadvantage by upping this. Overall, it was deemed unrealistic that crew levels would be increased voluntarily. The situation is hindered further by several flag states blocking votes relating to safe manning when they arise at IMO. The skeletal nature of crew is particularly felt in operational 'hotspots' – busy port periods, most notably.
- As automation improves, pressure on regulation to further decrease crew size is expected. It was felt that oil majors might be able to affect a slight increase in the fleet with which they engage but that this would not filter down to dry cargo. One company reported upping crew numbers during operations in regions with extreme conditions, such as ice, where it was easier to demonstrate the need for this investment.

Bureaucracy

- There was agreement that crew size was less of an issue, per se, compared to the increasing demands made of crew, 'with nothing being taken away'. This relates in part, to the incomplete transition to digitisation, such that seafarers are having to respond to multiple stakeholders in real time without the support of an optimised and reliable digital infrastructure. It was observed that a Master now faces the impossible task of needing to know '20,000 pages of requirements, as opposed to 5,000 previously'. The group felt that influencing regulators and flag states to reverse this trend was impossible without 'a lot of noise'.
- It was noted that despite this increased burden on crew, accidents have been reducing over the past 20 year. This was taken as testament to seafarers' resilience while also acknowledging that it was a question of 'if not when' seafarers' cognitive limitations would be reached.

Culture of care

- It was put to the group that research during COVID showed the importance of seafarers' experiencing a 'culture of care' for their psychological health. When asked to reflect on this notion, the group felt it to overlap with that of 'just culture', which companies reported implementing to replace 'no blame culture' of earlier times, such that the focus is not on what occurs but what

can be improved upon. It was also related to the notion of 'psychological safety', which usually (although definitions vary) refers to all employees feeling able to air questions, ideas, concerns or mistakes without fear of humiliation or punishment. Participants felt this to be an important transition that is still underway (since changing culture takes time).

- It was also felt that a 'culture of care' goes beyond occupational safety and health and relates to the whole package of benefits and support offered to seafarers and their families; that a holistic approach was needed (and possible). Related, it was noted that the risk of suicide among seafarers was high during the first few days after disembarkation, post contract, and more generally that mental health fluctuates, which reinforces the need for a holistic approach.
- A mind-shift is needed in which seafarers are not viewed primarily as just a route to profit. Even in purely financial terms, it was acknowledged that 'not caring could cost billions'. The group felt that the MLC 'has been a good start' but that 'you can't really regulate for care' – care has to be a long-term, authentic and consistent practice at all levels of an organisation, including the very top. It requires a genuine openness (one company described plans for an internal 'COVID review' involving ratings upwards) and not just 'rolling things out' without proper consultation.
- Culture change requires training of shoreside staff and senior crew in soft skills so that they are better able to recognise when crew members need support and how best to provide that support. Existing training of Masters tends to be an overly brief, tick-box exercise. Masters were recognised as perhaps the most significant determinant of culture onboard and as such, the priority for training, especially given that increasing responsibility and bureaucratic pressure on Masters reduces their tolerance for underperformance among crew. In addition, since many Masters later enter shoreside employment, their impact on company culture extends beyond the ship.
- A 'culture of care' means changing mindsets by widening definitions of work beyond immediate, practical tasks to also include taking time to talk to crewmates under stress. Such things 'are not an added extra; they are as important – if not more so – than anything else'.

- Crew needs to be proactively assured that speaking out about mental health needs will not jeopardise their future employment and companies must ensure that their actions support this.
- A disparity needs addressing between companies' response to mental versus physical health: seafarers needing healthcare for mental ill-health are asked more questions before being able to access help than they would be if they were suffering from a solely physical condition.
- The importance of social interaction and crew cohesion is vital in an onboard culture more conducive to positive psychological wellbeing.
- Care is also closely related to certainty and trust. During the pandemic, even companies with relatively advanced 'cultures of care' had diverted ships whose crew had already served more than 12 months. This undermined seafarers' sense of certainty, trust in the company and its regard for their wellbeing. To quote one participant: 'there has to be action and not just words; recognising seafarers as key workers doesn't mean anything if you can't get seafarers home'.
- Participants felt that overall, companies had asked less of their crew during COVID compared to 'normal' times; that they had been 'more caring and respectful' towards crew and that crew themselves had taken better care of themselves and made 'more decisions for themselves', because they were less sure of when usual sources of external help and support would be available.
- One group touched on different communication styles among crew and shore staff and the need for more communication and understanding between the two.
- The important role of charterers in creating a culture of care, trust and certainty was discussed. Superintendents are under pressure from charterers, who in turn 'pass the stress onto Masters'. Larger charterers might consider the effect of their demands on crew out of concern for their reputation or damage limitation but most do not.

Evidence and causation

- Participants agreed on the importance of measuring crew wellbeing in order to identify and address issues onboard.

Companies run regular or sporadic surveys, some using inhouse or consultant psychologists who might also conduct interviews with crew. Some also use reporting apps. The anonymised data from these exercises enable companies to identify trends and issues on particular ships, and to take action accordingly.

- Some participants expressed a desire to develop their measurement and evaluation capabilities by sharing ideas and good practice with other companies in the future. Particular interest was expressed in further development of lagging indicators for wellbeing, building on HiLo's Human Reliability product.
- Participants noted the widely recognised problem of seafarers' families not receiving compensation from insurers if their seafaring family member dies by suicide, which disincentivises crew from supporting investigators' efforts to accurately attribute cause of death. Companies' ability to change this appears limited. Related, participants felt that many companies lack genuine desire to establish accurate causation and statistics in relation to suicide – but also wider ill-health (and examples of COVID cases being concealed were cited as illustrative of this point). This relates back to (a lack of) 'culture of care' and also to a culture in which Value of Life is low. Justifying investment in measures that prevent mental ill-health and suicide must be based on a high Value of Life.
- It was felt that companies failed to engage with and/or had a poor understanding of much of the existing research and statistics on mental ill-health and suicide among seafarers – including the Seafarers' Happiness Index – and that in general, companies were more receptive to positive statistics (e.g. the percentage of 'happy' seafarers, as opposed to the percentage of 'unhappy' seafarers).

Training

- Companies providing mental health training reported positive feedback.
- It was felt that given the potentially sensitive nature of such training, employees must consent to taking part. For this reason, some participants did not feel it possible or appropriate for mental health training for seafarers to be mandatory.

- The Mental Health and Wellbeing Training Standard was recognised as the first, valuable guide and framework to what a mental health training course should cover, with the emphasis being on recognising symptoms, signposting and referral.
 - It was also recognised that training needs to be ongoing and not a one-off, tick-box exercise.
 - Cadets were deemed to be an important focus for training, building on the younger generation's relative mental health literacy.
 - It was proposed that existing first-aid courses could have a brief, additional section covering mental health definitions/terminology and signposting, as an initial awareness raising exercise.
- 29 June & 15 July round tables: breakout groups 2 – living conditions and work demands
- The group was asked to consider the following questions. It was acknowledged that responses will vary dependent on ship type, size, age, route, etc.

Breakout 2: risk factors relating to living conditions and work demands

Living conditions: for your organisation, addressing which of these risk factors is a priority?

- Poor quality and quantity and choice of food and availability of water
- Shared cabins/bathrooms, lack of space/storage space
- Inadequate provision for recreation
- Noise and vibration exposure – esp. in cabins
- Insufficient control of light and temperature

Breakout 2: risk factors relating to living conditions and work demands

Work demands - contractual issues and fatigue:

- Can anything be done about: short-term/voyage only contracts, contract length, failure to end contract on time and managing expectations (pre COVID), lack of flexibility in contract length?
- Do companies monitor timely reliefs? If yes, what standard do they set themselves? What do they do if falling short of their standard?
- If don't monitor directly, what indicators of long-term fatigue do they use?
- Short-term/acute tiredness: Watchkeeping practices – do companies still employ 6 on – 6 off? Have they tried any other watchkeeping schedules?
- How successful have attempts to empower masters e.g. to go to anchor and rest crews been? What actions/measures are taken to give days off, extra time off?
- Does acute tiredness feature in risk assessments or when planning voyage schedules? What attempts to gauge the risk from acute tiredness are employed? What mitigation strategies are employed?
- What measures are taken to understand peaks and troughs in workload on vessels? What is done to ensure that workload is not excessive? What support/relief is provided to mitigate against excessive demands and/or burnout?

Breakout 2: risk factors relating to living conditions and work demands

Work demands cont.

- Worker autonomy – what plans/actions do companies have/take to preserve masters' or chief engineers' management authority on their own vessels e.g. increasing control over work priorities, work pace, decision-making relating to work? How is the relationship between ship and shore managed to empower vessel management teams in these areas? How can be done to increase a sense of control in all crew?
- How are vessel teams protected from over bureaucratization of work, from interference from third parties, from criminalization?
- Do companies gauge the job satisfaction of their sea going staff? shore staff? What actions have they taken/what insights have they gained?

Food and water

- The group agreed that making drinking water accessible where needed onboard and providing high-quality and varied food (appropriate to crew's cultural/religious preference) was both easy to implement and important for seafarers' wellbeing.
- Participants described pro-actively encouraging crew to drink more water and hiring catering managers to review the nutritional value of food on ships and whether it sufficiently caters for cultural preferences.
- Some companies reported successfully using MCTC in order to address the long-standing tendency of galley crew to focus on their own national cuisine. MCTC gives cooks and aspiring messmen the confidence to diversify their repertoire, which 'translates into happy crew'.

Accommodation

- The consensus (in one group) was that accommodation standards have declined – that cabins were less 'human friendly and that that commercial pressures had meant that living space wasn't prioritised.
- A minority of companies buying second-hand ships that fail to meet their own accommodation standards will invest significantly in improvements, to the extent that they are possible.
- A mismatch in standards between officer and rating accommodation was noted, as well as a tendency (in Ultra Large container ships) to separate officer and rating

accommodation at forward and rear respectively, which reduces cohesion and reinforces divisions of labour.

- On more modern vessels, crew members (ratings and officers) have individual cabins while on some older ships, cabins are still shared. Opinions varied about whether sharing cabins was problematic (although there was consensus about shared bathrooms being undesirable). Many recognised the importance of crew having their own space and a story was relayed in which cadets arriving at college and faced with the prospect of having to share cabins, left. On the other hand, sharing cabins can counteract social isolation, develop bonds and facilitate transfer of knowledge.
- It was felt that firmer regulation was needed to ensure that 'off-the-shelf' yard designs guaranteed a minimum accommodation standard and that more communication was needed between naval architects and ship purchasers. A scenario was shared in which three leading interior designers - who had created ergonomic designs on aircraft and in large corporation offices - offered to design ship accommodation on a pro-bono basis, and no naval architect firm engaged with the offer.
- Good design can also reduce some sources of noise and vibration. Frequent and rapid port visits, however, result in seafarers struggling to sleep during noisy cargo operations – a situation that has worsened in recent years/decades. Such barriers to sleep support the case for shortening contracts.

- Poor maintenance contributes to noise and vibration. There is scope for increased attention to maintenance from Class and in turn, from regulation.
- Some participants felt that noise and vibration was something to which seafarers habituated rather than a continuous problem.
- There was uncertainty about the degree to which crew is able to control the heat and light in cabins. It was assumed that this was possible in more modern ships.
- Sufficient storage and efficient use of space in cabins (feeling cramped and cluttered impacts wellbeing) should be easy and makes a difference to day-to-day life but is often overlooked. For guidance, see for example SIRC's (2020) 'Recommended standard of accommodation for seafarers working on board cargo vessels' (request via sirc@cf.ac.uk).

Recreation

- 'Getting the design right' is part of what enables recreation – swimming pools, space for basketball, etc. – examples of facilities that research shows seafarers to value. Participating companies described providing gyms (including personal gym equipment in some cases), basketball nets, karaoke machines and DVDs. One described running a health and fitness campaign and giving prizes for most improved healthy lifestyle, which has led to 'exponential increases in health, morale and performance'.
- Managing internet access (while not a focus for these round tables) is also a vital part of fostering social interaction onboard.

Contract length and timely relief

- It was acknowledged that length of service varies by vessel type and other factors. In addition, while some seafarers would like shorter contracts, others would prefer longer contracts in order to maximise earnings. Citing research showing that seafarers' wellbeing declines as contract length increases, some participants felt that contracts should last between four – nine months and that companies/ILO/ITF needed to enforce this reduction to the current 11-month maximum, set out by the MLC. Ship owners, charterers and ports were also felt to have

agency in setting this standard (e.g. by ports refusing entry to ships and shipowners by not agreeing to 'no crew change clauses' in agreements with charterers, which is supported by the UN's Human Rights Due Diligence Tool).

- Some felt that the challenges of the crew-change crisis during COVID were part countered by seafarers being in a safe space away from COVID hotspots.
- Dialogue between ship and shore to proactively manage crew change to avoid fatigue before it beds in, was also noted as important, as was managing expectations – seafarers should be told the margin (e.g. 1-3 or 4 weeks longer/shorter) in which their length of service might vary and be kept abreast of changes, and in a manner that is sympathetic (which might require soft-skills training of shoreside staff). If a contract is going to overrun because a port call is cancelled, the crew member should be given the option of being taken off beforehand.

Bureaucracy and fatigue

- Increasing bureaucracy was noted as another risk factor in seafarers' psychological wellbeing; there is a real danger of Ship Management Systems becoming unmanageable as more checklists/requirements are added, without anything being taken away.
- It was felt that shipowners should be more active in discouraging cargo owners from demanding superfluous paperwork of crew.
- Companies should automate or move ashore bureaucratic burden, as much as possible.
- Port requirements – including bribes – were recognised as another source of bureaucratic pressure. While participants felt that companies have limited ability to influence this, they supported training senior crew to deal with port demands, in order to lessen the risk it poses to crew wellbeing.
- Related, it is vital that shore staff allow and empower Masters to 'stop work' when they deem it necessary for wellbeing and safety.
- Participants recognised a link between fatigue/being overworked and an increase in accidents, as well as

mental health problems, and discussed working hours and shift patterns on their companies' ships (e.g. eight-hour day, 40-hour week, overtime discouraged but compensated, 'six-on; six-off' for smaller ships).

- It was noted that working hours and demands are not the only cause of fatigue and that free and unlimited WiFi (introduced during COVID for the first time by some companies) contributed too. It was felt that crew needs to be reminded of the importance of rest and sleep, with some companies commissioning videos and other resources on the subject.
- Crew should be trained to recognise symptoms of fatigue in themselves and to speak up to senior officers about not being fit for duty. In turn, senior officers should be trained to foster this as a positive contribution to safety, rather than an individual's weakness.
- Multiple port visits in a short period, involving 'stations to cargo watch' in rapid succession at anti-social hours, were recognised as resulting in a significant build-up of fatigue.
- Chief Officers (COs) were identified as particularly at risk during busy port periods because of their numerous responsibilities (inspections and navigation and cargo watches). A participant reported a CO employee asking for help from the company – particularly on dangerous good stowage – because he was fatigued to the point 'of not seeing things straight'.
- Concern was expressed about senior crew being wrongly criminalised for discrepancies in paperwork caused by a lack of transparency in port/agent activities/processes, which needs addressing.
- Some participants felt there to be pressure to increase the number of port calls (citing complaints of only 40% reliability), while others felt it possible that the schedule be altered to make it less demanding of crew. Specifically, it was proposed that (especially smaller) liner-operators (LOs) can increase use of the hinterland network and reduce port calls in order to improve schedule reliability, reduce cost and pressure on crew. However, it was acknowledged that shippers, port operators and larger LOs lack incentives to reduce port calls.

Ship-shore communication and relationship

- Participants felt that vessels' increased connectivity was reducing the Master's autonomy, with the potential advantage of reducing reliance and pressure on the Master as decision-making becomes more shared. However, this requires clear communication between ship and shore as well as between crew members.
- During COVID, communication between ship and shore staff has increased, which participants felt has improved working relationships and morale. A participant reported his company's technical superintendents speaking to crew more often, including scheduling video calls. It was reported that superintendents were now more likely to identify with seafarers and to 'have their backs'; that there was 'more talk about people and how to look after them better'.
- Equally, a participant identified a need to engage officers and crew in 'the enterprise', so that they understand the 'shore perspective'. Engagement needs to be two-way and fully integrate those onboard with Head Office decision-making, which is enabled by improved connectivity and digitisation. It is also important that office staff spend time onboard.
- More generally, it was felt that the industry lacks the developed Human Resources Management approach for ship staff that is established ashore.

Job satisfaction

- Having simple Key Performance Indicators (KPIs) relating to wellbeing and job satisfaction (e.g. food, timely relief, communications, mood) – which are interrelated – is important. Companies vary in the way in which they collect this data; all agreed that it must be anonymised.
- One KPI is retention, which should be at 90-95%. Underperformance in this and any other KPI needs to be investigated and problems addressed.
- Companies should benchmark performance against comparable companies.
- Communication is key to job satisfaction – between ship and shore but also with families – it's important that seafarers feel that a company's concern extends to their family, by ensuring that salaries are paid on time and by providing relevant family activities and support.



Yale

29 King William Walk, Greenwich, London, SE10 9HX

020 8858 3696 | admin@seahospital.org.uk | seahospital.org.uk

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