

# Seafarer's Wellbeing on Board: a Scoping Review

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The author aims at synthesising the published literature on seafarers' mental and physical health and wellbeing. The reason for this study is to reveal the published literature on the mental and physical difficulties faced by seafarers, which have gained more importance in recent years. Especially during the COVID19 pandemic and afterwards, seafarers who have been on board much longer than their contracts had to go through very difficult processes. In this paper the studies that examine the concepts affecting mental health, such as depression, anxiety, isolation, psychological well-being and stress, and physical health, such as insomnia, poor alimentation, and fatigue are included. This review covers thematic analysis, results, and literature on wellbeing of the seafarers. Findings of the studies in the existing literature reveal that ship operators need to provide access to mental health resources and support services, such as counselling, to help seafarers cope with the stress and isolation of life at sea. On the other hand, opportunities for seafarers to maintain contact with their families and support their mental health need to be ensured while they are away from home. Supporting work-life balance provides opportunities for seafarers to access internet and communication facilities, offering regular shore leave, and encouraging engagement in activities that promote mental well-being. Moreover, for physical wellbeing ship management organisations should ensure access to medical care on board apart from telehealth, including emergency medical services, to address any physical health concerns. Organisational culture will promote a workplace culture that supports seafarers' mental and physical health and encourages open communication. This study provides a foundation for future maritime research and facilitates exploration of these concepts.

## KEY WORDS

- ~ Seafarer,
- ~ Mental,
- ~ Physical,
- ~ Wellness,
- ~ Wellbeing,
- ~ Welfare,
- ~ Maritime industry.

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## 1. INTRODUCTION

Seafarers are the backbone of the global shipping industry, responsible for transporting goods and people across the world's oceans. However, life at sea can be tough, with seafarers facing numerous challenges that can impact their physical and mental wellbeing (Hystad and Eid, 2016; Gander et al., 2008). Many psychosocial and physical stress factors affect seafarers, including elevated leadership responsibilities (time pressure and decision-related pressure, under-qualified subordinate crew members), absence from family and isolation (Slišković and Penezić, 2016), fatigue (Carotenuto et al., 2012), lack of sleep (Hystad and Eid, 2016), physical needs, recreation scarcity (Zhang and Zhao, 2017), workplace noise, ship movement, vibration, and heat (Oldenburg et al., 2009; Carotenuto et al., 2013; Oldenburg and Jensen, 2012; Oldenburg et al., 2013; Jepsen et al., 2015; Bal et al., 2016). Thanks to seafarers, 90 % of the world's trade is conducted by seaborne trade (Song and Yeo, 2004). Thereby seafaring is a challenging occupation that requires seafarers to work in a demanding and often isolated environment (Oldenburg et al., 2010), with seafarers facing a unique set of physical and mental health challenges due to the nature of their work, including long working hours, extreme weather conditions, poor accommodation, limited nutrition, and extended periods of separation from their families and communities. These challenges have a significant impact on the wellbeing of seafarers, both mentally and physically.

The importance of seafarers' wellbeing cannot be overstated. Not only does it impact the individual seafarer, but it also has implications for the safety and efficiency of the entire shipping industry (Hetherington et al., 2006). Furthermore, it is important to keep in mind that poor mental and physical health can lead to accidents and errors, decreased productivity, and increased absenteeism (Daley et al., 2009). The studies are being carried out on this topic. Despite the importance of seafarers' wellbeing, there is still a scarce number of research on this topic, particularly in developing countries. It is critical to consider seafarers as a distinct population in order to comprehend the effect of these triggering facts on their well-being. The aim of this scoping review is an attempt to compile all existing study relating to seafarers' physical and mental well-being. As a result, a review is required. The shipping industry is facing numerous challenges, including crew shortages and retention issues, which make it crucial to understand and address the factors that contribute towards the wellbeing of seafarers. Company-based strategies for improving or protecting seafarers' maritime health have been proposed (Abila, 2023). Unsurprisingly, the concentrate of these suggestions was not to motivate seafarers since the suggestions were mostly business-level policies and practices imposed on seafarers, such as antibullying and anti-harassment strategies and the encouragement of healthy lifestyles, such as good nutrition, rest, and social activities (Lefkowitz and Slade, 2019; Sampson and Ellis, 2021; Blackburn, 2020). The emerging importance of the seafarers' wellbeing urges this scoping review to engage with recent literature, including both mental and physical health.

In this paper, the author aims at reviewing the current state of knowledge on the mental and physical wellbeing of seafarers, including the factors that impact it, the interventions that have been implemented to improve it, and the gaps in the existing research. This review endeavours to identify what kind of mental and

physical challenges are encountered by seafarers throughout their maritime careers, along with potential solutions. This review compiles the most recent data on the many stressors that seafarers experience in an effort to pinpoint those that are particularly connected to a given duty at sea. On the basis of the reviewed data, potential strategies for enhancing seafarers' wellbeing are proposed.

## **2. MATERIAL & METHODS**

In this study, four (4) databases have been reviewed, such as Google Scholar, Web of Science, Science Direct, and PubMed, all with a view to identifying papers assessing the influence of psychological and physiological wellbeing of seafarers. This investigation has examined literature spanning from January 1, 2000, to March 22, 2023. The rationale for selecting this timeframe is to circumscribe the study within the most recent twenty-three years of data, aligning with the inception of scholarly exploration into the concept of seafarers' wellbeing during the 2000s. The studies have been synthesised according to PICOS (population, intervention, comparison, and outcome) PRISMA. The inclusion criteria comprise English-language papers indexed in WOS, SSCI, SCIE, SCOPUS, and ESCI, characterised by a substantial number of citations, focusing on seafarers as the target population, and aligning with predetermined keywords. Search keywords include: wellbeing, wellness, physical, welfare on board, mental, seafarer, mental wellbeing, psychological wellbeing, mental health, psychological stress, seafaring, fatigue, physiological wellbeing, physical problems onboard, seafaring problems, and stress at sea. In response to the inquiry, thirty-eight (38) scholarly articles have been identified exploring the nexus of psychological wellbeing and mental health in seafarers, while twenty-six (26) papers have been retrieved pertaining to the search query physical health and physiological wellness in seafarers according to the search strings, as mentioned before. Out of sixty-four (64) papers only fourteen (14) were selected as they fulfilled PICOS criteria. Review articles have not been excluded from the study.

## **3. MENTAL WELLBEING OF SEAFARERS**

Seafarers have been the unsung heroes of the maritime industry for centuries. Seeing as seafarers are essential to much of the world's trade, they had to carry on working throughout the pandemic. The Maritime Labour Convention (MLC, 2006) perceives seafarers' human rights and decent work in the maritime industry (ILO, 2006). While it is evident that wellness empowering is one of the current systems for seafarers, their physical and mental health have not always been regarded as top priorities. Undoubtedly, in modern global maritime businesses, power dynamics between employers and employees have been spotlighted in a capitalist and Marxist ideology of the rich exploiting the poor (Kitada, 2022). Sampson et al. (2017), short-term mental health problems arose between 2011 and 2016, with 37% of seafarers suffering from mental health issues. Only about twenty years ago were seafarers' problems with mental health recognised (Iversen, 2012). Over 40% of the seafarers in Baygi et al. (2021) study indicated general mental illnesses. It is a fact that the COVID-19 pandemic aggravated much of the stress felt by seafarers (Brooks and Greenberg, 2022). Previous studies have demonstrated that seafarers are particularly vulnerable to mental health issues and suicide (Iversen, 2012). The latest systematic review of literature focusing on seafarers' mental health, encompassing publications from 2012 to 2021, acknowledges a multitude of conceivable factors that contribute towards suboptimal mental well-being

among seafarers. These factors include persistent exposure to high levels of noise and vibration, a sense of insecurity while onboard, onerous responsibilities, prolonged working hours, night or irregular shifts, inadequate sleep, deficient cooperation between crew members, deficient management practices, insufficient social support, lack of autonomy in the workplace, and scheduling ambiguity (Brooks and Greenberg, 2022). Abila et al. (2023) conducted research on how seafarers' mental health has not been prioritised by seafarers, and how information and communication technology and formal education can encourage seafarers in healthcare. The findings of this study have demonstrated the pervasive culture of "ship first" in the maritime sector, where seafarers do not highlight their mental health because the ship's safe operations take priority over everything else. Data seems to have shown that seafarers recognise mental health interventions supplied by organisations as more effective when these have real consequences or effects on their families. As per media reports of the pandemic, concentrating on outbreaks on cruise ships, many of the crew suffered from burnout, stress, mental instability, and sleeplessness (Takahashi et al., 2020). On the other hand, mental and physical exhaustion as a result of enlarged contracts and/or a lack of shore leave, as well as wastage (i.e., seafarers' early retirement or abandoning the maritime sector) were also mentioned (Pauksztat et al., 2022; Devereux and Wadsworth, 2022; Hebbar and Mukesh, 2020). While Lucas et al. (2021) reported that many seafarers who called their health resource centre defined severe PTSD symptoms. Online clinical therapies on board can be an option for seafarers to have a peaceful mind. Robledo et al. (2021) revealed that utilising technology to conduct online clinical therapy sessions with clients has demonstrated a variety of benefits for them. It has been revealed that the client's mental health outcomes are similar when compared to face-to-face therapy. Battineni et al. (2021) discovered that 11.5% felt 'over-stressed,' while Hebbar and Mukesh (2020) unearthed that nearly 30% felt stressed. Also diminished shore leave and a shift toward more mixed-nationality crewing trends have both been recognised as possible risks to the mental health of seafarers (Borovnik, 2011; Iversen, 2012). Over half of the HR managers who answered Sampson and Ellis's (2019) questionnaire (55.6%) assumed that shore leave had decreased between 2006 and 2016. However, in this context, where we might expect employers to reimburse for such aspects by offering better amenities on board, a small proportion (3.9%) of HR manager participants believed that the number of recreational facilities ensured by their organisations to seafarers had decreased during the period. Brooks and Greenberg's (2022) review study found some proof that longer stays at sea during the pandemic and being on board longer than expected harmed mental health. Many seafarers were forced to prolong their contracts or postpone repatriation, frequently receiving insufficient information as to when they would be able to return home, giving them the impression that they had no authority over their lives and raising concerns about fatigue and a potential for accidents and injuries. Other challenges mentioned by participants included refusal of shore leave, concerns about budgeting and future employment, feeling isolated and alone, fears of COVID-19 infection, restricted access to essential supplies, and a sense of being unsupported by management. Ali et al. (2023) found that the psychological general well-being index, perceived stress scale, and job content questionnaire were recognised as three psychometric instruments for measuring work-related stress among seafarers. Zhao et al. (2021) revealed that seafarers attained communication services primarily through the market at reasonable prices, and they also received some limited free services. However, a greater number of seafarers indicated being overcharged.

Simultaneously, researchers discovered that older seafarers were more concerned with telephone communication, but less concerned with data availability. However, younger seafarers complained about the internet's speed and accessibility. On the other hand, Nielsen et al. (2013) findings showed both psychological and physical work conditions to be significant predictors of both turnover intention and job satisfaction, with safety perceptions, job demands, and team cohesion being the most powerful and coherent. In their study, Kanaki et al. (2022) identified that the pandemic had substantial impacts on seafarers, affecting them physically (38%), mentally (53%), and financially (40%). The extent of these effects was found to be influenced by factors such as the seafarers' country of origin, duration of time spent on board, and the presence of supportive family members. Specifically, seafarers employed on tankers and officers with more than three family members were found to be at a significantly higher risk of experiencing psychological, physical, or financial challenges. In another study, COVID-19's effect on seafarers' rights was investigated in three aspects: shore leave, repatriation, and medical assistance. The study revealed an unprecedented and previously unidentified widespread inclination among seafarers for shore leave, which saw a significant decline during the COVID-19 pandemic. Merely one-fifth of the seafarers exhibited willingness to consent to a contract extension, indicating the consequential impact on both job performance and overall well-being. Moreover, the study documented prevalence rates of several key parameters at the six-month mark into the pandemic, including delayed repatriations (21.44%), crew members with extended contracts (12.48%), crew members who had completed their contracts but were awaiting repatriation (8.96%), and crew members with a continuous service period exceeding twelve months (0.82%) (Hebbar and Mukesh, 2020). The welfare of seafarers is still jeopardised in many ways, including isolation and loneliness, fatigue, stress, and the fear that their occupation will be criminalised and focused on many locations all over the globe. To reduce incidents of unfair treatment and exploitation of seafarers, the paper concludes that constant modifications of maritime legislation are required (Exarchopoulos et al., 2018). On the other hand, the goal of this study by McVeigh et al. (2019) was to determine which personal and professional characteristics, known to have an effect on psychological structure and function in the maritime industry and other sectors, are most effective at predicting perceived stress and job satisfaction among a sample of merchant seafarers.

### **3.1. Anxiety**

Seafaring continues to be a hazardous and dangerous profession, and studies investigating the effect of COVID-19 on seafarers' maritime health have painted a bleak picture since the pandemic began. Self-reported symptoms of depression, anxiety, and general psychiatric disorders, for example, were higher during the pandemic than earlier (Pougnnet et al., 2020). In the research of Radic et al. (2020), eight of the nine participants mentioned feeling "stressed or nervous." Meanwhile, Coutroubis et al. (2020) revealed that 85% of 400 seafarers expressed concern about their co-workers' mental health. Baygi et al. (2022) discovered that 11-12% of 439 participants reported anxiety symptoms, even though only 2% self-identified as "anxious." Seafarers' suicide and ship owners abandoning seafarers during the pandemic continues to be an important but largely unknown issue (Bush, 2021; McVeigh et al., 2021). Pauksztat et al. (2022) discovered that seafarers polled during the pandemic had remarkably greater anxiety scores than a matched sample polled between 2015 and 2016. Upon

quantitative study by Radic et al. (2020) all nine of the participants reported at least some depressive symptoms. Research by Hebbar and Mukesh (2020) investigated the immediate effects of COVID-19 on the interruptions and difficulties in observing seafarers' rights to shore leave, repatriation, and medical care. The findings showed a previously unidentified majority preference for shore leave, which substantially decreased during COVID-19. Only a fifth of the seafarers readily agreed to an extension of their contract, which demonstrated a negative impact on work-performance and well-being. The seafarers mentioned above experienced trouble sleeping because of worries, fears, and anxieties (Radic, 2020). According to a recent study, frequent interpersonal relationships on board benefit seafarers' overall mental health. Collegial activities minimise anxiety and stress while also assisting seafarers in developing safe and efficient teamwork (ISWAN, 2021). Finally, Sau and Bhakta (2019) in their research compared how well machine learning systems performed while evaluating seafarers for depression and anxiety. The study places a strong emphasis on the use of machine learning technologies for automated mental health disorder screening. With this innovation, an automated computer-based analytic technique can replace a manually developed and time-consuming screening procedure for anxiety and depression with an efficacy level suitable for screening.

### **3.2. Post-traumatic stress symptoms**

Seafarers experience stress when they lack the resources needed to fulfil both work and family responsibilities. Work demands (i.e., separation from family) result in work-family conflict (WFC) for seafarers, as individuals devote more resources (such as time) to work, resulting in fewer resources devoted to families (Tsaur and Tang, 2012; Senbursa, 2022a). In a study conducted by Baygi et al. (2022), it was revealed that approximately 37% of the 439 seafarers included in the study reported disturbances in one or more of the three domains associated with post-traumatic stress disorder (PTSD), namely intrusion, hypervigilance, and avoidance. Furthermore, around 12% of the participants experienced disruptions in all three domains simultaneously. On the other hand, the aim of Slišković's (2020) study was to explain how the COVID-19 epidemic affected the welfare of seafarers. The study concentrated on gathering first-hand accounts of the present global epidemic from seafarers on board and seafarers at home. The study's findings on 752 seafarers revealed that concepts of mental, physical, social, and economic well-being were prevalent. Whereas seafarers at home mostly highlighted concerns to their economic well-being, seafarers on board primarily addressed threats to their mental, physical, and social well-being. Seafarers may experience stress when they lack the resources needed to fulfil both work and family responsibilities (Edwards and Rothbard, 2000). Work-family conflict has been recognised as one of the biggest contributors to seafarer stress (Thomas et al., 2003). Thus, as a result, it has been proven to harm people's mental and physical health (Charkhabi et al., 2016). An et al. (2020) discovered that job satisfaction played a moderating role in the relationships between work-family conflict, job stress, and seafarer performance in their study of merchant ship seafarers. Unexpected events may happen on board. Maritime piracy is one of the phenomena that affects seafarers' wellbeing. The repercussions of maritime traumas on seafarers' well-being and career choices can be attributed to the influence these traumatic experiences exert on the manifestation of post-traumatic stress symptoms (Seyle et al., 2018). Psychological discomfort can be minimised by a better awareness of the impacts of personal crises, overload,

or boredom when at sea, as well as an awareness that these impacts do exist and are best discussed. Promising initiatives include specialised social networking sites for those in distress, backed by online or in-person counselling. Providers of port welfare might also play a part (Carter and Karlshoej, 2017). According to Chung et al. (2017) analysis's findings, seafarers' personal and professional burnout are interdependent; nevertheless, only work-related burnout has a direct bearing on occurrences. Reappraisal, but not work-related burnout, is a successful emotion regulation technique for seafarers. Work-related burnout serves as a buffer between personal burnout and the good effects of occupational stress and tiredness on both. Table 1 shows the most cited seven articles on seafarers' mental wellbeing on board.

### **3.3. Happiness**

Happiness onboard is a multifaceted concept influenced by the dynamic interplay of various factors such as living conditions, work environment, social interactions, and the psychological resilience of individuals navigating the open seas. According to Hebbar and Mukesh (2020), 288 seafarers were unhappy; only 8% mentioned feeling happy regardless of circumstances. As per Pesel et al. (2020), 26% of 72 respondents expressed being unhappy and depressed during their latest tours of duty; nearly half felt less happy than usual, and 40% felt less capable of finding and appreciating spare time than before the pandemic. Ozdemir et al. (2022) stated that the difficulties seafarers encountered, such as spending prolonged amounts of time on board, connecting with individuals from various cultures and origins, and working and living with them despite their differences, called for mental resilience. Motivating factors are necessary for seafarers in order to make their life at sea tolerable. They can vary from tangible ones, like a high pay or extra benefits provided by the employer, to abstract ones, like feeling a sense of purpose in their work, being happy with their employment, or receiving fair treatment. According to the analyses by Papachristou et al. (2015), participants believe that the most significant problems preventing retention in the maritime industry are the separation from family and the ineffective communication with friends and family while at sea. The lack of communication with friends and family is the main factor that seafarers cite as the reason they would leave their career, even though they appear to be happy with their decision to enter it. This demonstrates unequivocally the role that communication plays in raising the retention rate for the maritime industry.



Article	Number of participants	Nationality	Indicator	Symptoms	Key Findings
Carotenuto, A., Fasanaro, A. M., Molino, I., Sibilio, F., Saturnino, A., Traini, E., and Amenta, F. (2013). The Psychological General Well-Being Index (PGWBI) for assessing stress of seafarers on board merchant ships. <i>International Maritime Health</i> , 64(4), 215-220. Available at: <a href="https://doi.org/10.5603/IMH.2013.0007">https://doi.org/10.5603/IMH.2013.0007</a>	162 seafarers on board	Argentine, Bulgarian, Indians, Italians, Romanian	Psychological General Well-Being Index (PGWBI) questionnaire	Stress	Management responsibility is more often associated with higher levels of stress
Chung, Y. S., Lee, P. T. W., and Lee, J. K. (2017). Burnout in seafarers: its antecedents and effects on incidents at sea. <i>Maritime Policy &amp; Management</i> , 44(7), 916-931. Available at: <a href="https://doi.org/10.1080/03088839.2017.1366672">https://doi.org/10.1080/03088839.2017.1366672</a> .	160 seafarers	Korean, Indonesian, Filipino	Copenhagen Burnout Inventory, ERI scale, Epworth Sleepiness Scale, Emotion Regulation Questionnaire	Stress, burnout, emotion exhaustion, sleepiness	Seafarers' burnout, influenced by personal and work-related factors, particularly work-related burnout directly impacts incidents.
Iversen, R. T. (2012). The mental health of seafarers. <i>International Maritime Health</i> , 63(2), 78-89.	Review article	Various nationalities	Deaths due to illness	Causes of poor seafarer mental health: Stress, Lack of shore leave, Separation from spouses and families, Loneliness, fatigue, Short ship-turnaround times, Job security, Cultural problems	<ul style="list-style-type: none"> <li>• Suicide data highlights enduringly dire and frequently fatal mental health conditions among seafarers. .</li> <li>• Reports extensively detail deaths on merchant ships due to depression, leading to suicide, underscoring the substantial impact on seafarers, their families, and ship owners, a matter of great importance.</li> </ul>



<p>Lefkowitz, R. Y., and Slade, M. D. (2019). Seafarer mental health study. ITF Seafarers Trust &amp; Yale University: ITF House. (pp. 49-60).</p>	<p>1572 seafarers</p>	<p>Philippines and Pacific region, Western Europe, North America, Eastern Europe and Asia</p>	<p>Patient Health Questionnaire, General Anxiety Disorder Questionnaire, Copenhagen Psychosocial Questionnaire</p>	<p>Sleepiness, anxiety, depression, suicidal ideation</p>	<ul style="list-style-type: none"> <li>• A quarter of seafarers, assessed through a health questionnaire, showed depression scores significantly surpassing those in other working and general populations.</li> <li>• Seventeen percent of surveyed seafarers, using a generalized anxiety disorder questionnaire, were identified as experiencing anxiety.</li> <li>• Twenty percent of surveyed seafarers reported suicidal thoughts, ranging from several days (12.5%), over half the days (5%), to nearly every day (2%) in the preceding two weeks.</li> <li>• Depression, anxiety, and suicidal thoughts were associated with a higher risk of injury and illness among seafarers while on board.</li> <li>• Depression, anxiety, and suicidal thoughts among seafarers were linked to a higher probability of planning to leave their seafaring job within the next six months.</li> <li>• Critical periods for mental health issues in the work/life cycle, notably during extended voyages.</li> </ul>
<p>McVeigh, J., MacLachlan, M., Vallières, F., Hyland, P., Stilz, R., Cox, H., et al. (2019). Identifying predictors of stress and job satisfaction in a sample of merchant seafarers using structural equation modeling. <i>Frontiers in Psychology</i>, 10, 70. Available at: <a href="https://doi.org/10.3389/fpsyg.2019.00070">https://doi.org/10.3389/fpsyg.2019.00070</a></p>	<p>329 seafarers</p>	<p>South Asian, Caucasian, East Asian, African, Middle Eastern, Latino/Hispanic, Other</p>	<p>The Dispositional Resilience Scale-15; and the Perceived Stress Scale-4</p>	<p>Stress and Job Satisfaction</p>	<p>Dispositional resilience emerges as a notably crucial factor concerning perceived stress, whereas instrumental work support seems to play a critical role in relation to job satisfaction.</p>

<p>Sau, A., and Bhakta, I. (2019). Screening of anxiety and depression among seafarers using machine learning technology. <i>Informatics in Medicine Unlocked</i>, 16, 100228. Available at: <a href="https://doi.org/10.1016/j.imu.2019.100228">https://doi.org/10.1016/j.imu.2019.100228</a></p>	<p>470 seafarers</p>	<p>Indian</p>	<p>Hamilton Anxiety Rating Scale, Hamilton Depression Rating Scale</p>	<p>Anxiety and depression</p>	<ul style="list-style-type: none"> <li>• Machine learning technology replaces manual and time-consuming anxiety and depression screening with an accurate automated computer-based analysis.</li> <li>• The automated approach attains sufficient accuracy for screening purposes.</li> </ul>
<p>Slišković, A. (2020). Seafarers' well-being in the context of the COVID-19 pandemic: A qualitative study. <i>Work</i>, 67(4), 799-809. Available at: <a href="https://doi.org/10.3233/WOR-203333">https://doi.org/10.3233/WOR-203333</a></p>	<p>752 seafarers</p>	<p>Turkey, the Philippines, Ukraine, Romania, the United Kingdom, India, Latvia, Russia, the Republic of Ireland, Germany, the Netherlands, the United States of America, Montenegro, Sweden, Oman, Bulgaria, and various other countries.</p>	<p>The questionnaire used included questions relating to basic sociodemographic and work characteristics, and one open question</p>	<p>Mental, physical, social and economic well-being</p>	<p>Seafarers onboard predominantly expressed concerns about threatened mental, physical, and social well-being, whereas those ashore primarily reported threats to their economic well-being.</p>

Table 1. Mental wellbeing articles (2000-2023)(Source: Author's Contribution)

### **3.4. Physiological Wellbeing of Seafarers**

The physical conditions on the ship are as challenging as the psychological ones. Recent interest in automation and digitalisation in the maritime sector is projected to lead to further crew reductions on board (WMU, 2019); however, technology can be viewed as a source of empowerment for seafarers (Abila et al., 2023) rather than replace them. Therefore, this situation leads to fatigue among seafarers on board. Seafarers, who keep shifts for hours and work on board, are faced with many physical symptoms such as insomnia and fatigue. In order to maintain seafarers' fitness levels, Battineni et al. (2019) researched the creation of a smartphone application for physical training. Sedentary lifestyle, or insufficient exercise, is an important risk factor for many diseases. It frequently occurs among seafarers because there are few opportunities for them to exercise while at sea. 93.3% of seafarers stated the app was simple to use, compared to 84.6% in the initial phase. At that particular time, 95% of users in the second phase were pleased, and 89.9% of users were satisfied with the practicality. At the end, as compared to the initial phase of evolution, authors had obtained better responses. Carter and Karlshøj (2017) underline the unique characteristics of the contexts in which seafarers live and work as a foundation for strategic development and identify the key lessons to be learned from experience in other industries. Also, a brief history of programmes that support seafarers' health is provided. It is crucial to recognise and treat arterial disorders, like high blood pressure, elevated blood lipid levels, and diabetes, as well as those caused by smoking, a poor diet, and obesity. Musculoskeletal disease is another symptom to be observed at sea. Frequent exercise to increase fitness can lower risks, and quick recovery from certain diseases, such as low back pain, can lower long-term disability rates on board. To ensure that musculoskeletal demands from normal tasks do not surpass accepted weight, reach, or frequency standards, sound systems of work are also required (Carter and Karlshøj, 2017). Jonglertmontree et al. (2022) reveal that individual and workplace environmental factors can both be considered as elements affecting mental health and psychological problems. Experience, age, health state (high obesity, poor sleep, and diabetes) and resilience are among the personal characteristics. There are two components to the work environment elements. The demands of the profession include pressure from employers, clients, and time, as well as those related to working hours, ship departments, job titles, journeys, time spent at sea, noise, and vibration. Effort-reward inequality, teamwork, and instrumental support were among the employment resources. Hjarnoe and Leppin (2013) reported that fitness levels, daily sugar consumption, and metabolic syndrome all showed significant changes. The management level's updating of the fitness facilities on board the ships may be one reason for the increased fitness rate. The cookery course intervention, which is intended to serve healthier daily meals on board, may be linked to the decline in seafarers' daily sugar intake and the prevalence of seafarers with metabolic syndrome. The results point to the possibility of changing the health indicators and behaviour of seafarers through a multi-component treatment programme that promotes health.

### **3.5. Heart disease & Obesity**

The cardiovascular health of seafarers emerges as a paramount concern within the maritime industry, reflecting a convergence of occupational, environmental, and lifestyle factors that collectively contribute to the

prevalence and impact of heart disease. As individuals engaged in the maritime profession navigate the challenges of extended periods at sea, physical labour, and the inherent stressors of maritime life, they are confronted with a unique set of circumstances that can significantly influence their cardiovascular well-being and malnutrition. Oldenburg et al. (2008) examined the prevalence of coronary risk indicators in seafarers serving aboard ships flying the German flag and assessed the risk of coronary heart disease (CHD) depending on parameters related to their line of work. Fifty-five (55) seafarers (34.2%) out of the whole sample of 161 (n = 161) had at least three CHD risk factors. The most significant independent risk variables for CHD in seafarers were high triglyceride levels (41.6%), older age (39.8%), and smoking (37.3%). When adjusting for age, European seafarers were about twice as likely to have more than three risk variables than non-Europeans. Galley/operating crew and engine room officers in particular were at a higher risk for cardiovascular disease. After adjusting for age, the research on German seamen revealed that they had a similar anticipated ten-year CHD risk to the working population of Germany of a similar age working ashore. Seafarers are exposed to a myriad of occupational risk factors for cardiovascular diseases (CVD), and despite the implementation of biennial pre-employment examinations and periodic medical fitness tests, there is an assumption of a (marginally) elevated risk of CVD among seafarers compared to the reference population onshore, attributed to the unique challenges of maritime life. Within the realm of seafaring, significant, modifiable risk factors for CVD include the stressors inherent to ship-specific situations, issues related to malnutrition, and the dearth of opportunities for physical exercise while on board. Moreover, the prognosis of acute and severe CVD events at sea often hinges on the timeliness and efficacy of interventions within the initial hours following symptom onset. However, the maritime environment faces limitations, characterised by a scarcity of health professionals on board and constrained treatment options, resulting in delayed implementation of effective cardio-pulmonary resuscitation and, consequently, inferior outcomes in comparison to onshore settings (Oldenburg, 2014). The unique challenges of a seafaring lifestyle, characterised by extended periods of confinement, limited recreational opportunities, sport activities and lack of fresh and limited nutrition, the potential impact of a demanding work environment, contribute towards an environment conducive to the development and exacerbation of obesity. Hjarne and Leppin (2014) conducted research on the health, happiness, diet, smoking, and physical activity of seafarers, a survey was undertaken in 2007–2008 with two Danish shipping companies. They revealed that 44% of male seafarers smoke every day, compared to 32% of Danish adult males overall. Compared to the 12% of Danish adult males who were obese with a BMI > 30, 25% of seafarers were obese. Metabolic syndrome was deemed to be present in 51% of the responders, compared to 20% of Danish adult males. Another research of Hansen et al. (2011) on 2,101 Danish seafarers were addressed in the study, with Body Mass Index (BMI) computed for each participant. The findings revealed that 66% of the tested subjects exhibited overweight status. Notably, male officers and ratings displayed a relative risk for being overweight, respectively. Fishermen and maritime students/trainees exhibited relative risks respectively. Female seafarers presented a relative risk for overweight status. Furthermore, a statistically significant increase in the prevalence of overweight merchant seafarers has been observed since 2001/2002. Lastly, Nas and Fiskin (2014) revealed a notable increase in the Body Mass Index (BMI) values of Turkish seafarers over the years. As Turkish male seafarers age, there is a

progressive elevation in their BMI values. After the age of 28, BMI scores surpass the acceptable threshold. Furthermore, they attain a peak average BMI value of 27.8 in their fifties.

### **3.6. Sleep**

Sleep, a fundamental physiological process crucial for cognitive functioning and overall well-being, assumes a distinctive significance within the context of maritime operations. Life onboard, whether for seafarers, crew members, or passengers, presents a unique set of challenges that can significantly impact sleep patterns and quality. Qin et al. (2021) discovered that lower self-rated health, fewer recreational activities or physical activities of seafarers per week, poor sleep quality, sleep length of less than 6 hours, and high self-perceived work stress were all linked to a greater symptom of depressive disorders. Seafarers also reported sleep problems, fatigue, and exhaustion (Sliskovic, 2020; Shan, 2021). On the other hand, Galić et al. (2022) investigated whether the number of hours slept while traveling on board had a mediating role in clarifying the link between job satisfaction and mental health as somatic symptom predictions. Findings showed that improved mental health directly causes fewer somatic symptoms, while higher job satisfaction indirectly decreases the number of somatic symptoms by allowing seafarers to sleep for longer periods of time at work. This research sheds light on the sleeping difficulties encountered by seafarers while on board, providing valuable insights into the implications of these difficulties and the coping mechanisms employed. Furthermore, a secondary finding of this study underscores the significance of fostering conducive work environments that promote the well-being of seafarers. Another set of research data revealed that while sleep deprivation, smoking, and poor eating were all greater at sea than they were at home, alcohol consumption was more common and physical activity was more prevalent, which was better for the maritime environment. Smoking, a poor diet, not getting enough exercise, and sleep deprivation have been proven to negatively connect with a number of health markers. Tension on board was linked to poor eating, lack of sleep, and more detrimental physical and mental health (Slišković and Penezić, 2017). Xiao et al. (2017) showed that 39.1% of the 917 male Chinese seafarers who participated in the study reported being very content with their overall quality of life, and 40.7% claimed feeling very supported by their social networks. Even after correcting for depressive symptoms, occupational stress, occupational activity, sleep length, and other pertinent factors, there are significant relationships between amount of social support and all health parameters of quality of life. Also, it was discovered that depression, occupational stress, occupational activities, and sleep length were factors affecting the health-related quality of life of seafarers.

### **3.7. Fatigue**

To understand the relationship between work characteristics and chronic fatigue, Andrei et al. (2020) investigated the roles that several fatigue-related processes, including acute weariness, sleep issues, and inter-shift recovery. The results demonstrated that working under time constraints and vigilance demands had different correlations with chronic fatigue, with vigilance requirements demonstrating a stronger association. Additionally, the fact that fatigue mechanisms were only partially responsible for this connection suggests that there may be additional mechanisms in action. Cham et al. (2021) study's findings further highlight the

significance of analysing the combined effects of concurrent job demands and taking into account how specific job demands could mitigate the detrimental effects brought on by other demands. It is crucial to think about how work-related stress may affect worker fatigue and wellbeing in situations where present and future employment may experience a drop in demands (such as automation). In contrast, the research conducted by An et al. (2022) revealed a noteworthy inverse association between vacation duration and overall fatigue levels. Additionally, a robust positive relationship was observed between the length of service time spent on board and overall fatigue. These findings underscore the significance of implementing an adequate vacation schedule, as it plays a pivotal role in alleviating seafarers' fatigue and positively influencing their sentiments regarding returning to work on board a vessel. The research of Özsever and Tavacıoğlu (2022) found that the participants' mental workload increased as their performance suffered and the amount of work they had to do increased. Pesel et al. (2020) found that seafarers suffered from insomnia to the point of being concerned in their study. Another finding of the study showed that the primary determining factor for seafarers is a disruption in circadian rhythm. The findings demonstrated that seafarers experience more tiredness when their circadian rhythm is altered more frequently (Özsever and Tavacıoğlu, 2018). Participants voiced concerns that fatigue had harmed their physical and mental health, and that gathered fatigue could lead to poor concentration, poor judgment, and potentially dangerous accidents or injuries (Sliškovic, 2020).

### **3.8. Physical Activity**

The physical well-being of seafarers stands as a pivotal facet of occupational health within the maritime sector, where the demands of a seafaring life pose distinctive challenges to the maintenance of a robust physical state. From the effects of prolonged exposure to maritime environmental conditions to the demands of physically demanding tasks on board, understanding and addressing the unique considerations of seafarers' physical well-being is essential. This academic exploration endeavours to dissect the multifaceted factors influencing the physical health of seafarers, examining aspects such as exercise opportunities, ergonomic considerations, health maintenance practices, and the implications of lifestyle factors specific to maritime life. Geving et al. (2007) examined the routines and preferences of seafarers in a Norwegian maritime organisation with regard to physical exercise on board ships. The findings showed that just 39% of respondents exercised while on board, compared to 70% who exercised twice or more each week at home. 20% never exercised on board, and 5% never exercised at home. 70% of seafarers prefer walking, cycling, and manual work when they are at home. Walking, cycling, and manual labour are the most popular forms of exercise on board. On a ship, strength training is frequently preferred over while home. The three main motivators are avoiding disease and injury, having a welcoming and comfortable gym on board, and maintaining a healthy weight. The findings demonstrated the substantial potential for enhancing and planning physical activity-related activities on board as a way to maintain good health and enhance seafarers' performance. On the other hand, Sampson et al. (2018) reported that seafarers on the bigger ships had better environment in 2016 compared to 2011. General cargo ships were the ones on which seafarers reported being most bothered by noise in their cabins from 2011 to 2016, but they now rank second. The ships on which seafarers were least likely to report being bothered by cabin noise were still tankers. In 2016, it was discovered that vessel size and noise disturbance were related and also, on smaller

vessels, vibration was said to be substantially severe. About half of seafarers who have access to the internet complained about the service's speed. More seafarers reported having access to email in 2016; 39% said they have unrestricted, free email. In 2016, 27% of seafarers had access to basketball, 22% of seafarers reported having access to a swimming pool, and 16% of seafarers reported having access to a sauna. About two thirds of seafarers had access to some type of gym in 2016. The availability of a welfare budget provision on board tankers dramatically decreased between 2011 and 2016. Nonetheless, there were notable rises in the percentages of seafarers who indicated that they would like access to swimming pools in 2016, while there were declines in the percentages who said they would like access to a computer terminal or telephone. Regarding the percentages of seafarers who had a reading lamp, set of drawers, table or desk, wash basin, bedding, towels, or toilet paper offered in their cabins, there were no discernible variances. Table 2 indicates the most cited seven seafarer's physical wellbeing articles in the literature.



Author/Year	Number of participants	Nationality	Indicator	Symptoms	Key Findings
<p>Jepsen, J. R., Zhao, Z., and van Leeuwen, W. M. (2015). Seafarer fatigue: a review of risk factors, consequences for seafarers' health and safety and options for mitigation. <i>International Maritime Health</i>, 66(2), 106-117. Available at: <a href="https://doi.org/10.5603/IMH.2015.0024">https://doi.org/10.5603/IMH.2015.0024</a></p>	<p>Review article</p>	<p>Various nationalities</p>	<p>Karolinska Sleepiness Scale, Multidimensional Fatigue Inventory, Visual Analogue Scales</p>	<p>Irregular work and sleep quantity, stress, fatigue, sleep quality, physical and individual risk factors</p>	<p>Employment at sea entails numerous fatigue-inducing risk factors. Beyond immediate consequences such as compromised cognition and accidents, fatigue contributes to the onset of chronic illnesses in seafarers through autonomic, immunologic, and metabolic pathways.</p>
<p>Hystad, S. W., and Eid, J. (2016). Sleep and fatigue among seafarers: the role of environmental stressors, duration at sea and psychological capital. <i>Safety and Health at Work</i>, 7(4), 363-371. Available at: <a href="https://doi.org/10.1016/j.shaw.2016.05.006">https://doi.org/10.1016/j.shaw.2016.05.006</a></p>	<p>742 seafarers</p>	<p>Norwegian and European nationalities</p>	<p>The Psychological Capital Questionnaire (PCQ), Swedish Occupational Fatigue Inventory, Pittsburgh Sleep Quality Index</p>	<p>Fatigue; isolated and confined environments; sleep quality, psychological capital (PsyCap)</p>	<ul style="list-style-type: none"> <li>• PsyCap demonstrated robust predictive capabilities, establishing statistically significant correlations with both fatigue and sleep quality across both sample groups.</li> <li>• Additionally, PsyCap exhibited an interactive influence with the duration spent at sea, elucidating its role in explaining fatigue among seafarers employed on passenger and cargo ships.</li> <li>• Notably, seafarers in the passenger and cargo ship sectors reported considerably elevated levels of fatigue compared to their counterparts in the offshore re-supply industry.</li> </ul>
<p>Hansen, H. L., Hjarnø, L., and Jepsen, J. R. (2011). Obesity continues to be a major health risk for Danish seafarers and fishermen. <i>International Maritime Health</i>, 62(2), 98-103.</p>	<p>2101 seafarers</p>	<p>Danish</p>	<p>Body Mass Index (BMI)</p>	<p>Obesity</p>	<ul style="list-style-type: none"> <li>• A total of 66% of seafarers in the study exhibited overweight conditions. Among male officers and ratings, the relative risk for experiencing overweight was 1.33 (95% CI: 1.25-1.38) and 1.30 (95% CI: 1.22-1.38), respectively.</li> </ul>

					<ul style="list-style-type: none"> <li>Fishermen demonstrated a relative risk of 1.45 (95% CI: 1.25-1.66), while maritime students and trainees exhibited a relative risk of 1.44 (95% CI: 1.25-1.66). Female seafarers displayed a relative risk of 1.42 (95% CI: 1.23-1.65) for being overweight. Notably, there was a statistically significant increase in the prevalence of overweight among merchant seafarers since 2001/2002.</li> </ul>
Oldenburg, M., Jensen, H. J., Latza, U., and Baur, X. (2008). Coronary risks among seafarers aboard German-flagged ships. <i>International Archives of Occupational and Environmental Health</i> , 81, 735-741.	205 seafarers	Germany, Poland, Russia/Ukraine, Croatia, Bulgaria, Lithuania, The Netherlands, Spain, Romania, Myanmar, Kiribati, Philippines, China, Cap Verde, Indonesia, Ghana, India, and Chile.	Blood sampling, and blood pressure measurements	Coronary risk factors	<ul style="list-style-type: none"> <li>Preeminent independent risk factors for coronary heart disease (CHD) among seafarers included hypertension (49.7%), elevated triglyceride levels (41.6%), advanced age (39.8%), and smoking (37.3%).</li> <li>Following age adjustment, European seafarers exhibited approximately a twofold increased likelihood of possessing more than three risk factors in comparison to their non-European counterparts.</li> </ul>
Hjarne, L., and Leppin, A. (2014). A risky occupation? (Un)healthy lifestyle behaviors among Danish seafarers. <i>Health Promotion International</i> , 29(4), 720-729. Available at: <a href="https://doi.org/10.1093/heapro/dat024">https://doi.org/10.1093/heapro/dat024</a>	360 employees	Danish	Fitness rating, body mass index (BMI), cholesterol measurement and blood pressure	Unhealthy behaviour; diabetes and cardiovascular disease.	<ul style="list-style-type: none"> <li>Daily smoking prevalence among seafarers reached 44%, exceeding the corresponding rate of 32% observed in the general Danish adult male population.</li> <li>A quarter of seafarers exhibited obesity, with a body mass index (BMI) exceeding 30, in contrast to the 12% prevalence observed among Danish adult males.</li> <li>Additionally, 51% of the respondents met the criteria for metabolic syndrome, a notably higher proportion compared to the 20% prevalence in the general Danish adult male population.</li> </ul>

<p>Geving, I. H., Jorgensen, K. U., Le Thi, M. S., and Sandsund, M. (2007). Physical activity levels among offshore fleet seafarers. <i>International Maritime Health</i>, 58(1-4), 103-114.</p>	<p>577 seafarers</p>	<p>Norway, Great Britain, Brazil, Australia, Portugal, Poland, Indonesia, New Zealand, Ireland, Nigeria, Sweden, Pakistan, Chile, East Timor, Philippines, Italy, Spain, and Hungary.</p>	<p>Personal interviews with seafarers, Nord-Trøndelag Health Study questionnaire (HUNT), the General Nordic Questionnaire for Psychological and Social Factors at Work</p>	<p>Physical activity limitations on board, overweight and musculoskeletal disorders.</p>	<ul style="list-style-type: none"> <li>• The findings indicated that a majority of respondents engaged in physical exercise twice or more times per week while at their residence, whereas only a minority (39%) maintained a similar exercise frequency while on board.</li> <li>• A notable proportion (20%) refrained from exercising altogether during their maritime duties, and a smaller percentage (5%) reported a lack of exercise during their time at home.</li> <li>• Walking emerged as the preferred physical activity for 70% of seafarers when at home, alongside cycling and manual labour. Similarly, on board, walking, cycling, and manual work were identified as the most prevalent forms of exercise.</li> </ul>
<p>Battineni, G., Di Canio, M., Chintalapudi, N., Amenta, F., and Nittari, G. (2019). Development of physical training smartphone application to maintain fitness levels in seafarers. <i>International Maritime Health</i>, 70(3), 180-186. Available at: <a href="https://doi.org/10.5603/IMH.2019.0028">https://doi.org/10.5603/IMH.2019.0028</a>.</p>	<p>28 seafarers</p>	<p>N/A</p>	<p>Through mobile app “wellness on a ship (WOS)”, personal fitness programs, body mass index (BMI)</p>	<p>Limited physical conditions on board, fitness levels, body mass index</p>	<p>Intelligent applications can be employed to strategize a high-quality physical activity regimen for seafarers, affording them the flexibility to select activities aligned with their physical attributes, fitness proficiency, and motivational factors.</p>

Table 2. Physical wellbeing articles (2000-2023) (Source: Author’s Contribution)

## 4. RECOMMENDATIONS

Seafarers often work long hours in isolation, away from their families and friends. This can lead to feelings of loneliness, stress, and anxiety, which can take a toll on their mental health (Carotenuto et al., 2012). To aid seafarers in navigating the challenges they face with, ship operators may facilitate access to mental health resources, such as tele-counselling services and support groups. Conversely, seafarers contend with an array of health hazards, encompassing fatigue, suboptimal nutrition, and exposure to adverse weather conditions (Jepsen et al., 2015). Ship management organisations are advised to ascertain the provision of seafarers with access to nourishing sustenance, potable water, and requisite medical attention for the preservation of their physical well-being. Consistent engagement in physical exercise and adherence to designated rest intervals further contribute towards the seafarers' overall health and serve to diminish the likelihood of injuries. *Safety* is another important issue to shed light on. Seafarers work in a dangerous environment, and accidents at sea can have serious consequences (Oldenburg et al., 2010). Employers ought to accord precedence to safety protocols, incorporating routine safety drills, meticulous equipment maintenance, and comprehensive training for emergency scenarios. This approach serves to mitigate the incidence of accidents, thereby ensuring the overall safety and well-being of seafarers. *Safe and healthy working conditions* are one of the most important factors on board (Akamangwa, 2016). Employers are obligated to furnish a secure and healthful workplace milieu, comprising suitable safety apparatus and training, along with periodic assessments of health and safety standards. *Work-Life Balance* is another crucial subject for seafarers while working and living onboard ships. Seafarers frequently endure prolonged working hours and extended separations from their families. Employers are encouraged to afford seafarers opportunities for familial communication, facilitated by provisions such as internet access and telecommunication services. Additionally, employers need to actively promote and facilitate regular breaks and shore leave for seafarers, thereby fostering a salubrious work-life balance (Senbursa, 2022b; Manalo et al., 2015). *Training and development* constitute pivotal components for seafarers, necessitating specialised instruction to execute their duties securely and proficiently (Kamis et al., 2020). Employers are advised to allocate resources to continuous training and developmental initiatives, thereby facilitating the acquisition of new skills and career progression for seafarers. This investment not only enhances job satisfaction and morale among seafarers, but also underscores the imperative of meticulous consideration towards remuneration and benefits.

Specific recommendations that need to be applied on board are as follows. Workplace culture is reflected in the values, beliefs, and presumptions that employees embrace or accept, so changing mindsets and behavioural patterns is essential to changing how things are done at the practice level (Manley et al., 2011). It is critical to keep in mind that satisfaction and success for external clients are closely correlated with employees' well-being, which includes their physical and mental health, as well as their sense of worth as coworkers (Patterson et al., 2010; Maben, 2010). Hence the establishment of a nurturing workplace culture that prioritises the physical and mental well-being of seafarers becomes imperative. The constrained availability of shore leaves at ports, coupled with restricted social activities, contributes to the onset of depressive tendencies among seafarers (Mellbye and Carter, 2017). Facilitating brief sojourns for seafarers at ports fosters opportunities for

social engagement during their layovers. It is imperative to conduct thorough screenings of seafarers for their mental health history prior to employment, a measure of considerable significance in mitigating untoward incidents during maritime contracts (Lefkowitz and Slade, 2019). Ship owners/operators can institute recurrent training and developmental initiatives aimed at enhancing the proficiency and career progression of seafarers. Moreover, fostering the advantages of social interaction via organised events such as barbeques, tournaments, cinema nights, international food days, and games, alongside the provision of recreational amenities such as gyms, swimming pools, hammams, saunas, and spa facilities, is instrumental in promoting the holistic well-being of seafarers (Markkula, 2011). Furthermore, ship operators must establish open channels of communication and advocate for a work-life equilibrium to fortify the mental health of seafarers. Affording access to information and communication technologies is instrumental in enabling seafarers to maintain connections with their families and support networks (Senbursa, 2022a; Senbursa, 2022b; Oldenburg and Jensen, 2019). Another salient consideration involves the promotion of a salubrious diet and consistent physical exercise regimen as preventive measures against physical maladies. Ensuring the provision of a pristine and secure water supply, alongside offering nutritious dietary options, is paramount in sustaining optimal physical well-being (Hjarnoe and Leppin, 2013). Adequate adjustment of rest and relaxation intervals through consistent breaks and designated rest periods serves as a preventive measure against both fatigue and unforeseen injuries among seafarers (Jepsen et al., 2015). It is imperative to possess appropriate safety equipment and undergo requisite training to mitigate the likelihood of accidents and injuries in maritime settings. Furthermore, persistent challenges remain in the remuneration domain, notably concerning delayed salary disbursements. Henceforth, maritime organisations, encompassing ship operators and owners, are compelled to guarantee equitable and punctual remuneration for seafarers, concurrently affording comprehensive benefits, including health insurance, retirement schemes, and designated periods for vacation. Through the implementation of the aforementioned recommendations and preventive strategies, ship operators and owners can contribute significantly to the safeguarding of the well-being and welfare of seafarers during maritime engagements. In summation, the multifaceted matter of seafarers' well-being at sea necessitates dedicated attention and proactive measures from both employers and policymakers. By systematically addressing pivotal facets encompassing mental health, physical well-being, safety protocols, work-life balance, and training and development initiatives, employers can effectively provide that seafarers receive the requisite support essential for maintaining a state of health, contentment, and productivity throughout their maritime endeavours.

#### **4.1. Conclusion**

This study systematically reviews a substantial body of literature pertaining to the well-being and wellness of seafarers. The primary aim of this investigation is to advocate for initiatives fostering the enhancement of both mental and physical health among seafarers, positing that such efforts hold the potential to ameliorate mental health and overall well-being during maritime engagements. The well-being of seafarers constitutes a pivotal factor for the sustainable advancement of the maritime industry. A recognition of this imperative by ship operators is essential. The implementation of a systematic approach is requisite to comprehensively assess and enhance the prevailing conditions within the seafaring system. From shipowners

to individual stakeholders and international non-governmental organisations, each entity must be prepared to proactively engage in transformative initiatives. The familial and interpersonal relationships continue to represent fundamental pillars, serving as steadfast anchors to the overall well-being of seafarers. Henceforth, paramount considerations for seafarers aboard vessels encompass connectivity and communication. The maritime profession, characterised by its demanding nature, subjects seafarers to physical, mental, and emotional stress. Significantly, the mental well-being of seafarers assumes heightened importance, influencing their job performance, job satisfaction, and organisational commitment. Hence it is imperative to ascertain that seafarers are afforded sufficient welfare provisions and satisfactory working conditions conducive to fostering their well-being. Simultaneously, the physical well-being of seafarers holds equal significance. Excessive working hours, isolation, and lack of sleep present the potential for fatigue and accidents, thereby jeopardising the safety of both the vessel and its crew. The human factor constitutes a pivotal dimension within the maritime industry, and employers are advised to acknowledge its significance. Consequently, ship owners are obligated to guarantee that seafarers are afforded adequate periods of rest, quality sleep, and connectivity, thereby mitigating stress and enhancing their physical well-being. Through a comprehensive literature review, the author has identified exhaustion, loneliness, sleep disturbances, prolonged separation from family, cross-cultural challenges, and fatigue as stressors. These stressors have been analysed in the context of diverse seafarer classifications and rankings. Through the establishment of a conducive work environment and the encouraging of a positive organisational culture, ship operators/owners have the capacity to mitigate the risks associated with burnout, monotony, and workplace harassment, all of which exert considerable influence on the mental well-being of seafarers. Seafarers are required to develop resilience as a means of effectively managing the challenges inherent in their profession. Resilience, denoting the capacity to adapt and recover from adverse circumstances, holds paramount importance in sustaining the overall well-being of seafarers. Promoting resilience among seafarers can be alleviated by employers through the implementation of training and support programmes aimed at fostering coping strategies and enhancing self-awareness. In conclusion, seafarers assume a pivotal role within the maritime industry, and their well-being constitutes an indispensable factor for the industry's enduring growth. The prioritisation of the mental and physical well-being of seafarers may constitute a foremost concern for ship operators/owners, necessitating the provision of comprehensive welfare measures and conducive working conditions. Maritime stakeholders are mandated to acknowledge the significance of the human factor and cultivate a supportive work environment, conducive to the promotion of the mental well-being of seafarers. Furthermore, the maritime industry necessitates collaborative engagement with international organisations, notably the International Maritime Organization (IMO), to advance the welfare of seafarers. The IMO has formulated a spectrum of guidelines and recommendations pertaining to seafarers' well-being, which employers may conscientiously observe to uphold the safety and welfare of seafarers. In a comprehensive sense, it is imperative to acknowledge the challenges confronting seafarers and proactively institute measures aimed at enhancing their well-being. Such initiatives are essential to ensuring the continued vital role of seafarers within the maritime industry, while maintaining their mental and physical health.

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