

## Review

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# Factors affecting mental health of seafarers on board merchant ships: a systematic review

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## Abstract

**Objectives:** Merchant ships represent a peculiar working environment with several challenges and risks. The specific situation on board of ships may affect the mental health of seafarers more remarkably than ashore workers.

**Content:** A systematic review of the literature has been carried out to identify the main causes of mood disorders among seafarers and the impact that these disorders have on their health. This review has analyzed the scientific literature published between January 2006 and December 2021 using the search engines PubMed, Web of Science (WoS) and Cumulative Index to Nursing and Allied Health Literature (CINAHL).

**Summary:** Social isolation, distance from families, fatigue, stress and long work shifts represent the main causes of mood disorders among seafarers.

**Outlook:** Strategies aimed at improving conditions of cohabitation on board, and a greater consideration of these problems are key for improving the mental health of workers at sea.

**Keywords:** fatigue; mental health; seafarers; stress; suicide.

## Introduction

Working on board of merchant ships is a dangerous job. Seafarers working on merchant vessels spend from weeks to months at sea, far from home, with limited medical facilities, and are exposed to an increased risk of diseases and accidents compared to the general population [1, 2].

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Length of work shifts, socio-psychological factors, and many other factors can significantly affect their mental health, as evidenced by some literature reviews on the subject [3, 4]. “According to the World Health Organization (WHO), mental health is “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community”. It is therefore important to note that the concept of mental health is broader than the simple concept of the absence of mental illness, indicating a psychological well-being that allows the subject to live peacefully” [5]. Accidents, illnesses, quality of assistance provided, “excessive work demands and perceptions of safety climate influenced the reported fatigue of the seafarers” represent distress risk factors potentially affecting mental health of seafarers [6]. Several factors can affect the mental health of seafarers. Whereas some of these factors cannot be changed for logistical reasons, some others can be [7]. Identification and management of these factors can contribute to improve the quality of life at sea.

A study carried out by the ITF Seafarers’ Trust in collaboration with Yale University reported that depression and anxiety are the most commonly encountered mood disorders among seafarers [8]. These problems were more prevalent in seafarers rather than in the general population, but also compared to relatively similar categories of workers (such as oil and gas workers).

Depression and anxiety also seem more frequent in young (18–35 years) and female seafarers. Suicidal thoughts would appear to be more frequent in workers in container ships. Anxiety, on the other hand, appears to be more frequent among deck and galley workers.

The main factors contributing to the decline of mental health of seafarers are long work shifts, long-term contracts (generally from 3 months or more), distance from home, poor social life on board and concern of not receiving adequate medical assistance in case of diseases on board [9, 10]. Cultural diversity and language barriers can contribute to making difficult to establish social relationships on board of merchant ships, increasing a feeling of isolation [11].

Even seafarers who do not have mood disorders state that homesickness and the long working period are the first causes of saddening, followed by the little rest time available, and the situation of work subordination [12].

Reducing the time away from home is a difficult challenge. Telephones and even better video conferencing facilities can help contacts with families. Other causes of mental distress could be reduced or in some cases eliminated, through joint actions between workers, employers or group leaders [12].

In this systematic review the main causes of altered seafarer's mental well-being are identified and analyzed. Mental health trends of seafarers and the possibilities for preventive measures to counter the development of mental illnesses were also considered. The aim of this work is to provide useful information for shipowners and the maritime industry to promote mental health improvement initiatives on board ships.

## Methods

### Search strategy

This review is based on the analysis of scientific literature published between January 2006 and December 2021. Papers were identified through the search engines PubMed, Web of Science (WoS) and Cumulative Index to Nursing and Allied Health Literature (CINAHL).

The keywords used were: “mental health”, “behavioural disorder”, “seafarers' stress”, “physical training on board”, and “seafarers' mental status”, or a combination of these definitions. In the latter case, we used the “AND” Boolean operator and reported the following search strings in PubMed, WoS, and CINAHL: “mental health and seafarers on board commercial ships”, “behavioural disorders and physical training onboard”, “mental health and stress onboard”.

The authors operated the preliminary assessment independently by reading the abstracts and drafting a list of the articles considered eligible. The lists derived from the independent work of each author were compared for possible inconsistencies. If an inconsistency was identified, the different ideas were discussed to reach a unanimous consensus. Once the authors decided which articles were worth including in the review, they read all of them to gather useful data for the research. The information evaluation was conducted independently, and opinions were compared to get to a general consensus.

This review includes research articles published in 16 years (2006–2021) and in all sectors where the mental health of seafarers working on board commercial ships is most active. Since 2006, when the Maritime Labour Convention (a rule of international law establishing minimum safety requirements to ensure the health of seafarers) was enacted, a growing interest in the subject was witnessed ... This review was made to evaluate whether the problem actually got the right scientific interest or it continues to be still not correctly identified, as it happened in the older literature.

The inclusion criteria for considering published literature were the following: availability of full-text English publication, original study, and research interest. The research initially provided 856 results, characterized by publications potentially relevant to the objectives of this study. Specifically, 429 works were found in PubMed, 43 in WoS and 384 in CINAHL. The types of articles analyzed were the following: research articles, case studies, surveys, and literature reviews. The inclusion criteria that guided the selection of the works were (1) type of study: analytical studies, original articles, and literature reviews published in the last 16 years (2006–2021), publications in English with full text available; and (2) articles dealing with seafarers on board merchant ships, where causes directly attributable to the mental problems of this category of workers are identified. The exclusion criteria were (1) studies with different characteristics other than those mentioned in the inclusion criteria and (2) studies that did not take into account factors directly related to the mental health of seafarers. We eliminated 333 duplicate articles.

From the analysis of the abstracts of selected articles, another 461 articles that were not pertinent to the objectives of this work were excluded for the following reasons: 318 articles related to the assessment of seafarers's mental pathological conditions, 46 articles assessed the quality of pre-boarding visits for the preliminary identification of mental health, and 97 articles did analyze the degree of satisfaction of seafarers about working conditions on board. The remaining 62 articles met the inclusion criteria and were considered for a further analysis.

### Quality evaluation

Quality evaluation of papers selected in the first phase of the study was made using the Newcastle-Ottawa Scale (NOS) [11]. NOS scores are used to assess the quality of non-randomized studies in meta-analyses, based on factors like structure, convenience, overall quality and suitability for review studies. Quality assessment was evaluated based on final NOS scores of each study: poor (if score 0–3), modest (4–6), and excellent (7–9). Studies that passed the quality test with NOS  $\geq 7$  were considered suitable for this review. Finally, 25 studies were chosen to carry out insight reviews. A complete description of study selection is summarized in Figure 1.

It should be emphasized that a selection process implemented by means of a particularly rigorous instrument such as the Newcastle-Ottawa Scale inevitably leads to the exclusion of a large number of papers resulting from an initial search. This also occurred in the research we carried out. This approach has the disadvantage of being very selective, thus excluding studies that may be of interest from the results, but has the advantage of allowing the authors to base their conclusions on more reliable data.

### Summary of article pool

As mentioned above, literature search identified 25 articles centered on seafarers's mental health.

Table 1 lists the studies about fatigue, stress, loneliness, boredom and social isolation factors on board ships that were selected for the present work. These articles are listed by the year of publication.

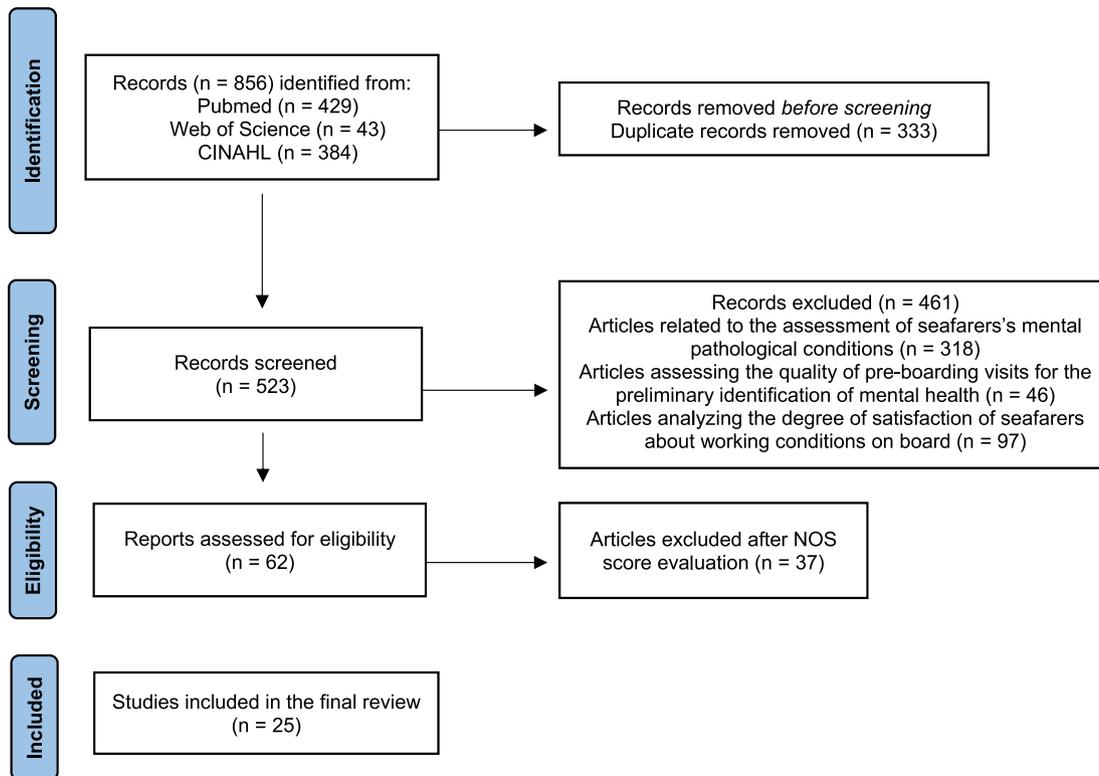


Figure 1: Diagram showing the article selection process.

## Results

The problem of mental issues among seafarers on board merchant ships was already identified in the past [34]. Doctors and psychologists often discussed the particular characteristics of working at sea to identify factors causing mental disorders in seafarers [35, 36]. Among these factors, fatigue and stress can affect the mental health of workers on ships, whereas loneliness and social isolation can contribute to this deterioration. On the other hand, legal protections and controls performed at the time of seafarer's enrollment are not enough to stem the problem.

### Fatigue

The International Maritime Organisation (IMO) guidelines define fatigue as: "A reduction of physical and/or mental condition, resulting from physical stress. It may impair almost all psycho-physical abilities including power, speed, reaction time, coordination, decision making, and/or emotional balance" [37]. The International Transport Federation (ITF) study "Seafarer fatigue: Wake up to the dangers" associates fatigue with any accidents that all crew members may incur [38].

Of the 25 articles chosen, 12 papers consider fatigue as the main cause of mental problems in marine workers. Many authors identify fatigue as a precursor to stress and mental disorders [14, 16, 21, 39, 40]. Fatigue seems to be inevitable due to activity of seafarers working on merchant ships. In general it becomes a problem as soon as the seafarer realizes that there is a problem to be addressed [16]. Papers examined have analyzed risks, acute effects, chronic health effects, and prevention of fatigue at sea. These elements are present in all the 25 articles considered. Fatigue can lead to mental health problems which are risk factors for chronic disease and early death (e.g. suicide) [14, 16, 18, 21, 39, 41]. Carotenuto et al. analyzed three different types of fatigue causes: demanding job, subjective stress and health problems [3]. Several studies have investigated in depth all aspects of fatigue such as irregular work shifts and sleep, physical risk factors, individual risk factors. All of these can cause short- and long-term health problems for seafarers [8, 13, 15–17, 22, 23, 40, 42].

Countermeasures and attempts to reduce fatigue at sea are also considered in different publications [3, 23] primarily from a regulatory point of view [3, 16, 17] rather than from a socio-health point of view. Regulatory perspective considers standard approaches such as the promotion of specific laws, international regulations, audits, supervision management,

**Table 1:** Articles selected for this review listed study. The articles are listed in ascending order of year of publication.

Reference	Study design	Risk factors	Proposed improvement strategy	Type of study	Geographical area of interest
1 Wadsworth et al. [13]	Patterns of fatigue among seafarers during a tour of duty	Fatigue, mental and psychological problems in seafarers	Measuring fatigue on in relation to the work environment	Survey	United Kingdom
2 Szymańska, Jaremin, and Rosik [14]	Suicides among polish sailors and fishermen	Impact of environmental factors and personality traits on the job, predictability and the possibility of preventing suicides on seagoing ships.	Workshops and psychological training, improving the skills to manage stressful situations, resolve conflicts.	Research article	Poland
3 Leszczyńska, Jezewska, and Jaremin [15]	Work-related stress	Triangulation concept in the search for work-related stress	Methodological approach to measure, control and manage the stress within international cooperation of maritime health reference centers.	Research article	Not specified
4 Allen, Wadsworth, and Smith [16]	Prevention and management of the fatigue factor: a Review of the literature	Fatigue risk factors. Fatigue as a serious health and safety issue.	Enforce guidelines, take serious measures to overcome the problem of false record-keeping. Take a more robust approach to regulation.	Literature review	Not specified
5 Carotenuto et al. [3]	Psychological stress in seafarers. Fatigue and stress assessment	Fatigue and stress as risk factors. Web consultancy for stress	Counseling and support at a distance, through the web, with a psychologist to reduce risk factors. Implementation of regulations	Literature review	Australian seafarers all over the World
6 Irvesen et al. [4]	Mental health of seafarers	Depression and suicide, loneliness, fatigue, stress, separation from spouses,	Approach to seafarers' welfare internationally	Literature review	Australia
7 Riis Jepsen, Zhao, and van Leeuwen [17]	Fatigue, risk factors, acute effects, chronic health effects, prevention	Fatigue, which in addition to acute effects, impaired cognition, accidents immunologic and metabolic pathways can develop chronic diseases in seafarers.	Alertness management strategies, adequate sleep hygiene, a more robust and realistic approach to regulation and Manning	Literature review	Not specified
8 Swift et al. [18]	Mental health at sea	Depression suicide isolation	Web-based counselling. Detecting and supporting mental illness, good diet, adequate internet communications.	Research article	Not specified
9 Dohrman et al. [19]	Fatigue, consequences of long work shifts, lack of sleep	Fatigue seems to be highly prevalent in the maritime industry, possibly compromising vigilance on the job.	Work-shifts regulations, more frequent breaks, international regulations	Literature review	Not specified
10 Slisković et al. [20]	Seafaring is characterized by specific stressors and health risks.	Work-related stressors, sleep deprivation and unhealthy diet, lower levels of physical and mental health.	Not evidenced prevention guideline.	Survey	Croatia
11 Mellbye et al. [21]	Depression and suicide among seafarers	Gender, multiculturalism, deep sea isolation	Reduce social isolation, particular attention to deep-sea voyages, long-term stress and loneliness	Literature review	Not specified
12 Jing Xiao et al. [22]	Social support and its association with HRQOL among Chinese seafarers.	Chinese seafarers have poorer HRQOL than the general population, but social support has a significant positive effect on it.	Efforts to improve social support should be undertaken. Internet and communication improvement	Survey	China

Table 1: (continued)

Reference	Study design	Risk factors	Proposed improvement strategy	Type of study	Geographical area of interest
13 Slisković et al. [20]	The dual life of seafarers and their families is recognized as a unique life which may bring various sources of stress for seafarers' partners.	Explanation of the mental health of seafarers' partners	Resilience, relationship satisfaction, perceived social support, and use of stress coping strategies	Survey	United Kingdom, India, China
14 Oldenburg et al. [11]	Stress and strain among seafarers related to the occupational groups	Reduction of sleep, long work-shifts, chronic fatigue	A tailor-made health promotion program on board, professionally adapted sport program.	Survey	North Europe (The English channel)
15 McVeigh et al. [23]	Stress predictors	Risk for stress, a factor known to impact mental health. Depression, anxiety, suicide, and alcohol or drug dependence are recognized health problems.	Equal and supportive overall work environment. Support the psychosocial well-being of seafaring organization	Survey	Not specified
16 Lefkowitz, Slade, and Redlich [24]	Claims for damages from 2007 to 2015	Recent reviews assessing stress in seafaring describe social isolation, poor sleep/fatigue, limited recreation activities and multicultural crews as potential sources of stress while working at sea	Not evidenced prevention guideline	Research article	Not specified
17 Jadegen et al. [25]	Impact of seafarers boredom	Boredom is related to their psychological state especially depressive. Boredom is influenced by external factors related to living and working conditions	Screen for seafarers prone to boredom and depression at the recruitment	Survey	Not specified
18 An et al. [26]	Impact of work-family conflicts and job stress on seafarers' job performance	Work-family conflicts	Reducing work stress and increasing job satisfaction	Survey	Asia, Europe, America
19 Russo et al. [27]	Seafarers' response to stress	Lack of communication skills, especially those related to anxiety, fears and negative thoughts	Not evidenced prevention guideline	Survey	Croatia
20 Plopa et al. [28]	Impact of prolonged social isolation on seafarers' mental well-being	Difficulty in anticipating challenges, novelty of expedition conditions, reduced tolerance to environmental hostilities, negative emotions related to separation from family and homeland	Not evidenced prevention guideline	Research Article	Poland
21 Pauksztat et al. [29]	Effects of the COVID-19 pandemic crisis on the mental state of seafarers	Workloads taken beyond the tolerable limit as a result of the pandemic crisis (in terms of length of time on board, working hours, hierarchical level and vessel characteristics)	Reducing workloads, providing adequate tools to manage high job demands, setting up systems to manage and solve the mental health problems of seafarers	Survey	Asia and Europe
22 Zamora et al. [30]	Effects of daily social media exposure on seafarers' anxiety and depression	Increased daily social media use; working experience of 10 years or less	Not evidenced prevention guideline	Survey	Philippines

Table 1: (continued)

Reference	Study design	Risk factors	Proposed improvement strategy	Type of study	Geographical area of interest
23 Lucas et al. [31]	Impact of the COVID-19 pandemic on the mental well-being of seafarers	Travel restrictions preventing repatriation and access to health care; dismissals; quarantine periods on board without salary	Psychological health care, repatriations and financial solutions	Literature Review	Not specified
24 Baygi et al. [32]	Psychosocial distress factors affecting sailors linked to the COVID-19 pandemic	Excessively long periods of time on board; serving as an officer	Monitoring the psychosocial distress of seafarers during the COVID-19 pandemic emergency	Survey	Multinational
25 Abila and Acejo [33]	Mental health of seafarers	Fear of being a victim of piracy crimes	Developing policies and programmes for the promotion of mental health through mental health education	Narrative review	Philippines

scheduling of work rest and sleep, in order to decrease the risk caused by fatigue [8]. The socio-health aspect analyzes corrective approaches concerning daily fatigue, quality, and quantity of sleep, work shifts, and nutrition [3, 11, 13, 15, 16, 25].

## Stress

Seafarers are subject to numerous stress factors, most common are: adverse weather conditions, extreme variations in temperature, being tied up at sea for long periods of time, noise and vibrations, conflicts between crew members, separation from family, long working hours and shift work, irregular and poor-quality sleep, often poor-quality food, frequent crew changes, poor job and contract security [27].

Stress on board may also be secondary to experiencing a particularly tense atmosphere due to the fear of piracy attacks [33].

Stress and fatigue are closely related [3, 15, 16]. Stress can be due to fatigue [21, 39, 40], and could be associated with alcohol and drug abuse, and other mental problems [14, 18, 23–25, 39].

Some authors have also proposed measurement and prevention measures for stress [22, 23].

The cause of stress in mariners is mainly related to environmental situations, which can lead to serious problems and, in the worst cases, to substance abuse and suicide. The stress of mariners affects their partners too, though to a lesser extent [20]. Eight articles have analyzed the problem of suicides on board, from different perspectives, namely the analysis of the number of cases over the years [3, 22, 35] the evolution of mental illness up to suicide

[3, 14, 24, 41], the association with alcohol and drugs abuse [3, 14, 18, 21].

Szymańska et al. define suicidal tendencies at sea as consequences of extreme stress, which outweigh adaptive abilities [14]. This situation represents a real danger to personal integrity and leads to the disappearance of the instinct for self-preservation instinct. Remedies and measures that can mitigate psychic problems about the working environment are also analyzed [13]. Some of these may consist in the promotion of on-board exercise programs [18], prevention and control of alcohol abuse, sleep and diet improvement [16, 20, 25, 41]. Another aid to mental health may come through telemedicine [43, 44]. Through telemedicine we may provide professional advice to solve the psychological difficulties of seafarers on board ships giving remote advice and support [3, 45].

## Loneliness, boredom and social isolation

The problem of loneliness at sea is investigated in 11 articles of those selected for this analysis. This is related to stress, especially for long periods of navigation (8–10 months) [21] and is associated with the distance from the family for long periods [3, 26]. There are family-level repercussions, with the involvement of the partners, with possible intimate and relational consequences [26, 41]. Loneliness has been reported as a possible cause of suicide in vulnerable subjects, especially those working/living in particular environments like the open sea. Seafarers can compensate for the loneliness with excessive consumption of smoke and/or alcohol [18, 23–25, 35]. Loneliness can result from the lack of social contacts on board, often caused by existing language barriers between colleagues [21].

Boredom is analyzed in 3 studies [16, 18, 25]. It could deteriorate mental health with detrimental consequences for the quality of the work done [25]. It can also cause fatigue in the seafarer [16], and be the trigger of a serious problem such as social isolation. Social isolation has been analyzed in 11 of the selected works [3, 14, 15, 18, 21, 23–25, 28, 35, 41].

Swift has analyzed the difference between loneliness and social isolation. Loneliness is a person's subjective emotional state, while social isolation is the state of deprivation of social contact. It is a form of the psychological state of alienation and can cause feelings of boredom, marginality, exclusion, anger, despair, sadness, frustration and above all loneliness [18]. Social isolation is one of the major causes of psychological problems on board and has caused a decrease in the number of seafarers in western countries [8]. Isolation can lead to despair and depression [3].

Isolation is also defined as a great challenge for seafarer's mental health [21]. The same author has hypothesized a solution that may remedy social isolation: the possibility of including their partners in travel and in the working activity, where possible [18].

There are many proposals of a "communicative" kind to prevent loneliness and the sense of isolation on board, through the provision of instruments and stations for communications (for example Skype or other video calling software) and Internet access, as well as access to video recordings major sporting events, and receiving news from around the world [3, 18, 21, 35].

Also of interest is the amplifying effect of perceived social isolation attributable to social media use [30]. Continuous and frequent exposure to idealized representations of people leading lives full of sociality and success can lead to feelings of envy, which can promote the onset of depression.

The COVID-19 pandemic that erupted in late 2019 has contributed to even more extreme isolation conditions for many sailors [29, 31, 32, 46, 47].

In many cases, borders were closed, and travel restrictions led to changes in crew changes, further prolonging many seafarers' time at sea.

Restrictions related to the health emergency imposed severe limitations on shore leave, which was even banned in many ports.

This was compounded by additional stressors such as fear of contagion, job insecurity, concern for the welfare of family members and more difficult access to medical care.

## Abuse

Physical and/or verbal abuse on board can occur both between colleagues and between employer and employees.

Prolonged, cruel and oppressive abuse is among the causes of depression, anxiety and suicidal thoughts among seafarers [24]. The main types of abuse found on board are: physical and/or verbal offenses, humiliation, personal insults, ridiculing a person, or his/her abilities, either in private or in front of others; Sudden rages or displays of temper against an individual or group, persistent criticism; making unreasonable demands of staff or colleagues, etc [48].

Competent authorities must take into consideration the problems of abuse on board since they can have serious consequences on the seafarer's mental and working status. Wrong behaviors should be reported promptly, and reporting handled anonymously to avoid repercussions on the alerter [48]. Investigations on this phenomenon must be carried out objectively and independently, analyzing any circumstance that may have led to the phenomenon of abuse [48]. Marine authorities and shipping companies shall monitor these behaviors by establishing severe penalties especially for repeated physical abuse phenomena, as well as for other work environments.

## Regulations

The lack of specific international regulations relating to the activity of seafarers in the world contributes to the irresolution of the problem of stress on board [3, 16, 17, 49]. Marine industry regulations are apparently focused more on seafarer's individual problems rather than harmonizing the norms of each individual country [50].

In the articles examined, the norms are analyzed in reference to specific situations. Allen et al. addresses in depth the problem of fatigue and the regulations of seafarers' shifts and working hours. They address a complex issue – the chance to verify the actual working time during navigation. They call for an approach that allows better management of working times, for example through registers or logbooks [16].

Another essential requirement is to apply existing guidelines with mandatory provisions and take serious measures to overcome the problem of false record-keeping. Working hours are likely to be under-recorded by managers or individual workers on board commercial ships who are afraid of losing their current or future occupation by subjecting their company to legislative control.

The International Labor Organization (ILO) Convention regarding the maximum of working hours on board, and ILO Conventions 92, 133, 140, 141, and 147, introduce higher living standards on board ships such as noise control and air conditioning [17]. The limits of working hours

and hours off work reported in the Maritime Labor Convention 2006 are similar to those in ILO 180 [51].

The International Safety Management (ISM) Code states that if fatigue, excessive hours of work, or lack of adequate rest are or should be apparent, the master and the company should intervene as soon as possible to solve this problem [17]. What emerges is the need for greater legislative support in matters of close interest to mariners, also through the help of national and international shipping companies and agencies [40].

## Discussion

Numerous factors may make seafarers prone to suffer from mental disorders. In many of the papers analyzed, fatigue is identified as a factor potentially inducing mental disorders. There is no univocal definition of “fatigue”. However, it is generally defined as: “a state of feeling tired, weary, or sleepy that results from prolonged mental or physical work, extended periods of anxiety, exposure to harsh environments, or loss of sleep.” [37].

The consequences of fatigue can be different, including reduced performance and decreased alertness [37]. The latter can be dangerous in the commercial shipbuilding industry. Seafarer fatigue should be addressed using standard approaches (e.g., regulation, adequate training, audit) which should be applied similarly to other health and safety issues. Dealing with fatigue in the naval environment requires a multidisciplinary approach based on some basic principles (e.g. lifestyle habits, rest, medication, workload) which must be identified and managed to manage this human element issue [19, 37, 38].

Overall, the results of the above-mentioned study confirmed the great impact of isolation from families, lack of adequate training, uncaring work environment, lack of job satisfaction, on the onset of mental problems among seafarers. These ailments increase with the prolongation of the journey and persist even in the days following the landing [8]. The naval environment daily puts the sea workers to stress and health hazards. The negative impact that some events or work peculiarities can be so serious to cause a deterioration of the seafarer’s mental health.

For years the literature has highlighted how the mental health of seafarers is a serious problem. Despite this, it has not always been treated with proper attention. Seafarers’ mental health issues have been often considered less important than more tangible problems, such as accidents or physical pathologies.

Taking into account the impact that mental health can have on general health, the way forward is to consider

psychological wellbeing as serious as physical safety. The starting point could be a revision of the current regulations in force, greater control of shifts, more rest times, wider possibilities for recreation and contact with the family.

Actions taken by other transport industries can be considered as examples and applied in the maritime sector. We live in a period in which, especially thanks to technology, the specific problems of the naval environment can be addressed. Through ITCs, the tools and solutions with which to face, improve and manage the mental health of this category of workers, all too neglected to date, shall be identified [52–54].

Tackling those factors that undermine the mental health of seafarers and at the same time improve the working environment may bring benefits to the health of sea workers, but also the entire maritime industry.

Regarding strategies to counteract the onset of mental illness, physical activity plays a crucial role in the seafarers’ wellbeing, as well as in the general population [55]. This must be stimulated on board, promoting group activities that can lift their mood through the release of hormones such as endorphins and serotonin [10, 56]. Physical wellness can contribute to promote mental wellbeing, facilitating social relationships [57].

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