Healthy workplace onboard: Insights gained from the COVID-19 impact on mental health and wellbeing of seafarers

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Abstract.

BACKGROUND: Seafarers' mental health is seriously affected by COVID-19. The pandemic could act as a catalyst for change with respect to seafarers' mental health protection and promotion.

OBJECTIVE: The study explores the main factors contributing to the mental health and wellbeing of seafarers. Moreover, elements to help seafarers lessen the impact of the pandemic on their work and life onboard are analyzed, and their role in developing a positive psychosocial environment and promoting a healthy workplace onboard are discussed.

METHODS: The study involved the use of an *ad hoc* questionnaire and the adoption of both quantitative and qualitative methods. The sample included one hundred and five active seafarers.

RESULTS: Ninety-six percent of the sample stated that mental health is a very or extremely important part of their general health. Seafarers perceive that their mental health has been seriously impacted by COVID-19. Major factors contributing to seafarers' mental health and wellbeing reveal three groups of factors: rest and spare time-related factors, communication/relationship with the external world, and interaction and social life on board factors.

CONCLUSIONS: Strategies suggested by seafarers for coping with "inevitable" psychological stress produced by COVID-19 and promoting their wellbeing include managerial, emotional, facilities-related (including communication infrastructure), physical, and social elements to promote wellbeing. Economic, intellectual, and spiritual elements also have to be taken into consideration and require further investigation. Building on seafarers' insights and experiences, a healthy environment onboard should cultivate holistically the four main spheres of a healthy workplace (physical work environment, psychosocial work environment, personal health resources, and enterprise community involvement) and the five features of a healthy psychosocial environment (social, emotional, physical, intellectual and spiritual) under all circumstances, whether exceptional or ordinary.

Keywords: Healthy work environment, pandemic, mental health, seafaring

1. Introduction

Merchant ships transport about 90% of global trade by volume, including food, medical supplies, commodities and energy [1]. Seafarers play a critical role in the maritime industry, and their working and living conditions -very harsh in normal situations- are being seriously affected by COVID-19. Psychological health is probably the sphere of seafarers most affected by the pandemic. As the pandemic continues, the mental health and safety of crews are under threat, imperilling the global economic recovery from COVID-19 [2].

Since the COVID-19 pandemic outbreak, the issue of the mental health of seafarers has been receiving greater attention. This is not surprising as travel restrictions and failure to declare seafarers as "key workers" in many countries have put them

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in an unprecedented stressful situation. In response, the International Maritime Organization (IMO) has called on all Member States to designate seafarers as key workers providing an essential service [3]. Nevertheless, there are stranded seafarers who cannot return home and, conversely, others who cannot sign on for new employment. IMO informs that, on 12 April 2020, a seafarer onboard a container ship sent a call for help, describing serious impacts on the crew's mental health: "We have meals, everything is okay, but the main thing is our psychological health" [4]. Disturbing trends indicate an increase in the number of suicides among crew members on board passenger ships [5] and an increase in the number of man overboard incidents during COVID-19 (AMSA, 2020). The increasing demand of seafarers for social and psychological support is being evidenced [6]. The Seafarers' Happiness Index, carried out by the Mission to Seafarers charity, highlights that crews feel unsupported during COVID-19, mainly due to extended contracts, lack of shore leave, lack of connectivity, and concerns around mental wellbeing [7].

The objectives of the research include: 1) to explore the impact of COVID-19 on seafarers' mental health and wellbeing and the main contributing factors; 2) to investigate the ways helping seafarers to overcome the negative impact of COVID-19 on their mental health and wellbeing; 3) based on the research outcomes, to propose insights about using a proactive approach in promoting the balanced mental health of seafarers and a healthy workplace.

1.1. Seafarers' working environment and psychosocial factors: Impact on mental health and wellbeing

Seafaring is dangerous work and has been associated with mental health risk and ill-health conditions [8–11]. The most frequently presented issues in counselling sessions with seafarers in Australia are depression, workplace issues, anxiety, substance use, and stress [12]. A study by Yale University [13] shows that, along with physical health-related conditions (i.e. high cholesterol, high blood pressure), sleep disorders, depression, high rates of anxiety and suicidal ideation are frequently self-reported by seafarers, in line with previous studies [14]. As a career, seafaring is an occupation with an increased risk of suicide [15–17].

Demanding work conditions and the complex life of seafarers while on board [18] are reported as

key factors affecting their mental health. A literature review on factors contributing to the psychological stress of seafarers identified separation from family, loneliness on board, fatigue, multi-nationality, limited recreation activity, and sleep deprivation [9]. A study conducted by the Australian Maritime Safety Agency [19] concluded that work pressures, work resources, and fatigue and lack of sleep combined explained 49.7 per cent of the symptoms of poor mental health. The research carried out by Yale University [13] found that work environmental factors (non-caring company culture, violence at work) were risk factors associated with poor mental health, along with low job satisfaction, and self-rated ill-health. Another recent study conducted by Cardiff University [20] similarly found that factors undermining mental health were isolation, loneliness, lack of shore leave, fear of criminalization, fear of job loss, and separation from family; meanwhile, factors supporting mental health are related to life and work conditions: conditions of work, internet access, shore leave, relationships on board, recreation and accommodation, and physical health.

1.2. The importance of seafarers' mental health and wellbeing for the shipping industry

Studies show the effect of poor emotional wellbeing, psychological distress, and individual factors on accidents and accident proneness at sea [21–24]. Depression, anxiety, and suicidal ideation have been associated with an increased likelihood of injury and illness while working on board the vessel; as a consequence, safety is highly compromised [13, 25]. The MARTHA project [26] found fatigue and stress increase and motivation decreases for most crew members as the voyage length increases; and periods in the work/life cycle are associated with high-risk of mental health issues, most notably, during the extension of a voyage. Moreover, mental impairment has been also associated with an increased likelihood of planning to leave work as a seafarer in the next 6 months [13], affecting the retention and attraction of new seafarers.

1.3. Rapid social change and rights violation as "major psychosocial stressors" for seafarers during COVID-19

Several biological, psychological, environmental, and socioeconomic factors determine the mental health of an individual at any moment in time. Fur-

thermore, there are factors designated as "major psychosocial stressors" that are associated with poor mental health, such as rapid social changes and human rights violations [27]. In fact, COVID-19 is provoking a rapid social change because of its capacity to alter the prevailing societal state and lead to a qualitative transformation of the society. As a result, several seafarers' rights are being altered. A general overview of the impact and response to the COVID-19 pandemic on the maritime industry, including challenges seafarers are facing relating to quarantine requirements, restrictions on border crossings with border closures, repatriation and crew changeovers, abandonment, renewal of certificates and licensing of seafarers, resupply and ship surveys has been recently provided by Doumbia-Henry [28]. The Maritime Labour Convention (MLC)[1] is the international legislative framework that sets out seafarers' rights and minimum standards for their working and living conditions, including health on board. MLC 2006, as amended, concerns health matters mainly through title 4 on "health protection, medical care, welfare, and social security." As part of health protection, the Convention claims that preventive measures, such as health promotion and educational health programs must be taken. AMSA's safety data has identified a significant increase in the number of MLC complaints (about 40%) since the beginning of the COVID-19 pandemic [29]. The complaints relate to seafarers serving with expired Seafarer Employment Agreements, absence of plans for repatriation at the end of agreements, and serving in excess of 11 months onboard. In fact, COVID-19 is affecting many working and living conditions of the "Seafarers bill of rights" -as Convention is often called-, including: extended contracts for those on board (and unemployment for those at home), delayed repatriation, lack of access to medical care, lack of shore leave and limited/no access to on shore welfare facilities. The effect of the infringement of these basic rights on the mental health of seafarers undoubtedly involves high stress and fatigue on board, and in turn higher risk of incidents and accidents, as well as social (e.g., the image of seafarers as carriers of the virus in some cultures when they go back home) and business impacts (e.g., seafarers who do not want to sign in back the vessel under fears of being stranded).

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[1]The International Labour Organization's MLC (2006) website contains the Convention and other key resources: http://www.ilo.org/global/standards/maritime-labour-convention/lang–en/index.htm.

2. Material and methods

For the purposes of the investigation, a mixed-method research approach was used. A questionnaire was originally designed and distributed to a sample of active seafarers among the researchers' networks who were contacted either directly by email or through social media platforms. The questionnaire was released on the 5th of August 2020 and responses were accepted for 15 days. Participants were on board or had just signed off, so all of them had been exposed to the effects of COVID-19. Inclusion criteria were being a seafarer and having served on board since the pandemic broke out in March 2020. Seafarers from all ranks, gender, age, nationality and type of ship were included. At least 200 seafarers were contacted to participate in the study. One hundred and eight seafarers accepted to participate and answered the questionnaire but three were excluded from the study because their questionnaires were incomplete.

The World Maritime University's Research Ethics Committee (REC) approved the research, involving human participation, on August 3 (REC-20-47(M)). The research ethics were ensured by securing the anonymity of the respondents and informing them about the aims and process of the research through the consent form. An introductory part of the questionnaire was included to cover confidentiality aspects. It also explained to the respondents the aims of the study and provided them with a definition of mental health, as follows: '*This questionnaire aims to explore the impact of onboard occupation in seafarers' mental health and wellbeing. The term mental health as defined by the World Health Organization refers to "a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to her or his community." Moreover, the goal of the questionnaire is to research if, through Maritime Education and Training on mental health and wellbeing, the life of seafarers at sea could be optimized. In addition, some questions will explore the impact of COVID-19 on mental seafarers' health and wellbeing.*'

Statistical analysis of quantitative data was performed using the Statistical Package for Social Science (SPSS Inc., version 26.0, IBM). Medians and ranges were calculated for ordinal variables. Frequencies were calculated for categorical variables. The Pearson chi-square test (for crosstabs) and non-parametric tests (i.e., Kruskal Wallis, Dunn's pairwise and Mann Whitney U with Bonferroni cor-

Table 1
Structure and content of the *ad hoc* questionnaire[a]

Question	Response type	Description
Sociodemographic factors		
Age Gender Nationality Seagoing experience (years at sea) Current position Time on the position Department (Bridge, Engine, Both) Type of vessels Type of ship register	Open-ended	Sociodemographic and other relevant information to define the sample of participants
Mental health as a part of general health		
To what extent do you think that mental health is a key aspect of your general health?	5-point Likert scale (1 = not at all important-5 = extremely important)	To understand seafarers' perception of the relevance of mental health to general health
Impact of COVID-19 on seafarer's mental health and wellbeing		
How much has your mental health and wellbeing been affected by the COVID-19 pandemic?	5-point Likert scale (1 = not at all affected-5 = extremely affected)	To understand the impact of the COVID-19 pandemic on mental health and well being
To what extent has each aspect been affected by the COVID-19 pandemic? 18 factors[b] mostly contributing to mental health presented separately (identified in the literature)		Internal consistency for the 18 items as measured by the Cronbach's Alpha was excellent (**α = 0.93**)
What would help you to go through the COVID-19 pandemic and its negative impact on your work and life on board?	Open-ended	To identify the most important issues helping seafarers to reduce the negative impacts of the COVID pandemic on their mental health

[a]The original questionnaire captured additional information. The table contains just the aspects of the questionnaire relevant to the study on the impact of COVID-19. [b]The factors covered working and personal conditions, operational issues, vessel design, and living and working environment.

rection) were used to assess the relationship between COVID-19 and the sociodemographic and work-related variables. A *p*-value of <0.05 was considered to be significant. Furthermore, content analysis was applied to the open- ended question about elements that could help seafarers to overcome the negative consequences of the pandemic.

The questionnaire was designed with Google Forms and contained three sections: 1) Sociodemographic, 2) Factors contributing to mental health and wellbeing[2], 3) Impact of COVID-19 and

main mental health and wellbeing-related-factors affected. Table 1 shows a description of the main aspects of the questionnaire designed for the study.

3. Results

The respondent sample included one hundred and five active seafarers (Table 2), 12% of whom were female. The median age of the respondents (26), and the median years of service at sea (3) indicate that the survey population was relatively young (27% are cadets). This could be considered as an advantage for the purpose of the current research because the survey participants have sufficient experience working at sea but, at the same time, their insights have not been "contaminated" by long periods spent at sea. The sociodemographic and work-related characteristics also reveal a range of experiences (as shown in Table 2).

Almost all the respondents (96%) believe that mental health is a very important or extremely important

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[2]The study of factors contributing to mental health and wellbeing was the core of a Master's Dissertation by one of the authors, titled Seafarers' Mental Health and Well-being: The Role of Maritime Education and Training [30]. One of the main findings of the study was that major factors contributing to the mental health and wellbeing of the participants included: 1) factors affecting relationship with the external world (i.e. limited access to the internet, being away from family and friends), 2) factors affecting interaction and social life on board (i.e. leadership style, relationship with colleagues-atmosphere on board, and crew social activities and interaction), and 3) factors having an impact on rest and spare time (i.e. length of the contract, unbalanced work and rest hours and getting on shore).

Table 2
Main sociodemographic and work-related characteristics of the respondents

Sample characteristics	n (%) or median (range) (Total N = 105)
Age, years	26 (19–61)
Gender	
Male	92 (87.6)
Female	13 (12.4)
Nationality	
Filipino	40 (38.1)
Greek	21 (20.0)
Lithuanian	12 (11.4)
Other	32 (30.5)
Seagoing experience, years	3 (<1–39)
Position on ship	
Officer	60 (57.1)
Cadet/Apprentice	29 (27.6)
Rating	16 (15.2)
Time in current rank, years	1.4 (<1–33)
Area on ship	
Deck	80 (76.2)
Engine	16 (15.2)
Deck & engine	9 (8.6)
Type of ship	
Tanker ship	37 (35.2)
Bulk carrier/General cargo	30 (28.6)
RO-RO	10 (9.5)
Container ship	9 (8.6)
Passenger / Cruise ship	7 (6.7)
Special purpose ship	7 (6.7)
Offshore ships	5 (4.8)
Type of ship register	
National register	69 (66.3)
Open register	35 (33.7)

Fig. 1. Importance of mental health to general health.
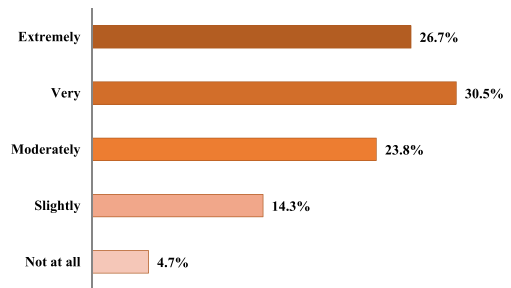
Fig. 2. Impact of the COVID-19 on seafarers' mental health and wellbeing.

part of their general health (Fig. 1). No respondent chose the category "slightly".

Regarding the impact of COVID-19, more than half of the sample (58%) pointed out that their mental health and wellbeing had been very or extremely affected during the pandemic, and 24% of the respondents reported a moderate impact (Fig. 2). A Kruskal-Wallis H test showed that the impact of COVID-19 was statistically related to years of service at sea, $\chi2(2) = 9.006$, $p = 0.01$, with a mean rank years score of 38.63 for not at all-slightly, 45.92 for moderately, and 60.33 for very-extremely impacted. Dunn's pairwise tests were carried out. There was evidence ($p = 0.01$, adjusted using the Bonferroni correction) of a difference between the group who stated "no impact-slight impact" (median years: 1.12) and those who stated "very- extremely impacted" (median years: 4). There was no evidence of a difference between the other pairs. Moreover, just 34% of the cadet group stated that their mental health had been very or extremely impacted by COVID-19 i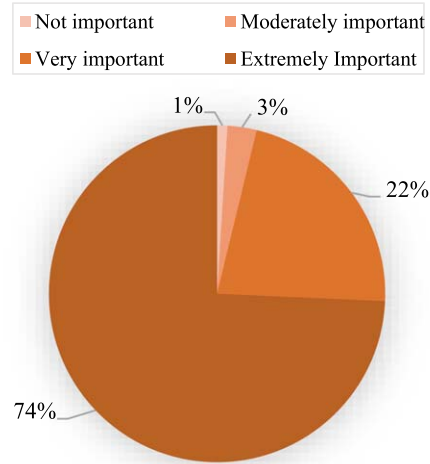n comparison with 68.8% of ratings and 65% of officers. In the "not at all-slightly affected" category, 34.5% of cadets, 15% of officers, and 6,3% of ratings were represented. These differences were significant, $\chi2(4) = 10.161$, $p = 0.04$. The impact of COVID-19 was not statistically related to other sociodemographic and work-related variables.

The aspects related to mental health and wellbeing most affected by COVID-19 as indicated by the respondents are shown in Fig. 3. Factors indicated as being very or extremely affected by COVID-19 include, getting ashore (64%), length of the contract (63 %), being away from family and friends (55%), the unexpected extension of the contract (58 %), no relief as per contract (49%), and unbalanced work and rest hours schedule (44%). In addition, the respondents stated that their relationship with colleagues-atmosphere on board (38%) and teamwork spirit (40%) have also been highly impacted by the COVID-19 pandemic. Other aspects affected moderately according to at least 1/3 of the sample

Legend: ▪ Not at all ▪ Slightly ▪ Moderately ▪ Very ▪ Extremely

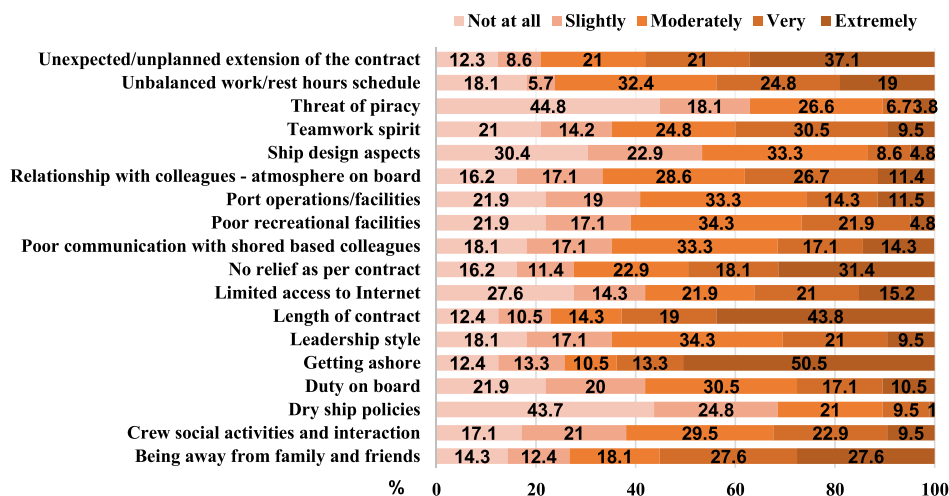| Factor	Not at all	Slightly	Moderately	Very	Extremely
Unexpected/unplanned extension of the contract	12.3	8.6	21	21	37.1
Unbalanced work/rest hours schedule	18.1	5.7	32.4	24.8	19
Threat of piracy	44.8		18.1	26.6	6.7 3.8
Teamwork spirit	21	14.2	24.8	30.5	9.5
Ship design aspects	30.4		22.9	33.3	8.6 4.8
Relationship with colleagues - atmosphere on board	16.2	17.1	28.6	26.7	11.4
Port operations/facilities	21.9	19	33.3	14.3	11.5
Poor recreational facilities	21.9	17.1	34.3	21.9	4.8
Poor communication with shored based colleagues	18.1	17.1	33.3	17.1	14.3
No relief as per contract	16.2	11.4	22.9	18.1	31.4
Limited access to Internet	27.6	14.3	21.9	21	15.2
Length of contract	12.4	10.5	14.3	19	43.8
Leadership style	18.1	17.1	34.3	21	9.5
Getting ashore	12.4	13.3	10.5	13.3	50.5
Duty on board	21.9	20	30.5	17.1	10.5
Dry ship policies	43.7		24.8	21	9.5 1
Crew social activities and interaction	17.1	21	29.5	22.9	9.5
Being away from family and friends	14.3	12.4	18.1	27.6	27.6

% 0 20 40 60 80 100

Fig. 3. Factors contributing to mental health most affected by COVID-19.

include port operations, the threat of piracy, limited access to the internet, poor communication with shore, leadership style, duty on board and crew social activities. Then major factors contributing to the mental health and wellbeing of the participants included: 1) factors having an impact on rest and spare time (i.e. getting ashore, length/extension of the contract, no relief as per contract, unbalanced work and rest hours and getting on shore), 2) factors affecting relationship with the external world (i.e. being away from family and friends, limited access to internet, poor communication with shore), and 3) factors affecting interaction and social life on board (i.e. relationship with colleagues- atmosphere on board, crew social activities and interaction, and leadership style).

A content analysis of responses to the open question regarding the factors helping to overcome negative effects of the COVID19 pandemic resulted in nine categories: managerial, facilities- related, economic, emotional, social, physical, intellectual, spiritual, and "nothing can be done". The sample of the citations of responses according to the categories is presented in Table 3. The frequency of mention of each category is presented in Fig. 4.

The 9 categories include the five areas of wellbeing defined by Macleod (social, emotional, physical, intellectual, and spiritual) [31], three additional factors (managerial, facilities-related, and economic factors), and one group of responses not fitting into any previously defined categories, named as "nothing can be done".

The biggest number of responses (Fig. 4, 45 cases – 26%) highlighted that properly performed managerial activities could help to overcome difficulties during the COVID-19 pandemic. They reflect aspects related to the actions performed by the company management ashore and onboard, which could be accepted by the crew as positive if provided in the proper timely manner, and as negative, if not properly taken (Table 3): information (code M1), support (code M2), safety culture (code M3), management system (code M4), and changing crew (code M5). The second most important category mentioned by the respondents as potentially helpful in overcoming the negative effects of COVID-19 was "Emotional factors" (39 cases – 23%). This category is associated with emotional support from colleagues on board, family, and having an optimistic positive mindset: codes E1 – colleagues, E2 – self, and E3 – family. The third most important group of factors helping participants to maintain wellbeing were categorized as "Facilities" (20 cases – 12%). Convenient sport, recreational facilities, and internet connection were mentioned by 17 (11%) participants. Under the "Physical" category (17 cases – 10%) fall aspects related to the physical environment and/or measures: proper uninterrupted resting hours (code P1); focus on work tasks (code P2); work conditions (P3); strong immune system and vaccination (code P5); possibility to come ashore (code P6), which was understood by seafarers as having two types of impact – the negative, as restrictions to go ashore do not allow seafarers to "relieve from stress on board", and the positive - as staying on board isolates "from the dangers . . . in ports"; one response was coded as "extraordinary" (code P4) mentioning "passing away" as helping

Table 3
Sample's answers according to the identified categories

Cat.	Coding	#	Samples of answers
"Nothing can be done" (hopelessness)		11	"COVID-19 is the same as a disaster, so we only accept it. No choice", 'I am not worried about the COVID-19… this is a global fate"
Economic	Ec1-salary/compensation	12	"Raise of payment", " Company may give bonus or additional salary to all seafarers serving more than their signed contract and being not able to repatriate due to several countries restrictions", "Uplift bonus in your monthly salary for the extra days serviced onboard", "extra wages", "bonuses", "compensation", "5–10% wage increase…"
Managerial	M1- information	15	"To have better information about the schedule of disembarkation of the crew on board", "Clear answers to questions", "More information from management about short term strategy of the company", "More clarity from the company as to what was to happen", "Company regular encouragement through article's and letters", "Always be updated on what's going on about the pandemic"
	M2 - support	6	"Company support for families", "Continuous support and assurance from the company", "More individual support"
	M3 - safety culture	3	"Safety awareness", "Keep positive environment onboard", "Strictly rules such as wearing gloves, masks, using disinfecting liquid, keeping distance from each other. And especially when the rules became a day routine, the life on board is much better", "Follow the protocol always protect yourself"
	M4 - management system	5	"If there is a poor management system onboard it will also affect the seafarers both officers and ratings", "A good working and social environment onboard", "Being treated as an equal by those who are in charge", "The industry treats cadets poorly and do not provide training opportunities despite being requested and earned. I find that especially during COVID my opportunities onboard have further reduced and have not been able to progress with my TRB. This time onboard has driven me to consider leaving the profession and the cadet ship"
	M5 - changing crew	16	"Companies relief others from their contracts on time", "More flexible crew changes", "Faster repatriation process and faster embarking process"
Facilities	F1 - internet	17	"Good internet access", "The company should install permanent WIFI connection onboard so the crew won't depend and spend much money for mobile data, since frequent communication with families and loves ones helps make our minds at ease, makes us aware of what's happening so we don't have to worry all the time", "Internet and media platforms"
	F2 - sport/recreational facilities	3	"More recreational activities onboard", "Listening to songs", "Recreational activities helped a lot thus preventing us seafarers from overthinking", "Sport"
Social	S1 - communication	15	"Constant social communication", "Better communication from shore", "Good communication with the family"
	S2 - help lines	1	"Help lines"
Emotional	E1 - colleagues	7	"Supports from colleagues", "We need to help each other and be open about what they feel"
	E2 - family	16	"Supports from family", "The most important thing that helped me through this pandemic is my family"
	E3 - self	16	"Patience", "Positive outlook", "My dreams and goals in life", "Having an optimistic mindset", "Focus on… being Positive always", "My goals and dedication in life", "Positive mindset"
Physical	P1 - rest	3	"At least an uninterrupted resting period"
	P2 – focus on work tasks	2	"Slacking of duties", "My everyday task onboard makes my life productive and busy on the ship. Being able to keep myself busy and productive helps me minimize my time thinking of all problems and stresses I need to deal with", "Focus on work onboard"
	P3 - work conditions	4	"Better working conditions"
	P4 - extraordinary	1	"Pass away"
	P5 - vaccination/health	2	"Keeping up with the immune system", "Vaccine will be soon available"
	P6 - come ashore	5	"The negative impact is we cannot go ashore which one thing that relieved us from stress on board", "Being onboard is like you're being isolated from the dangers of this pandemic not unless if going on ports"

(Continued)

Table 3
(*Continued*)

| Cat.	Coding	#	Samples of answers
Intellectual	I1 - education	7	"The most important thing that helped me through this pandemic is . . . that I have learned in my trainings/seminars", "Seminars/Trainings are good but the impact maybe won't last long (as provided by shipping company). Academy approach is better for me as they mould cadets as a whole . . . ", "Shell Resilience Training", "Individual educational initiatives (i.e. coaching, self-studies, personal educational activities) on mental health and well-being, training from the shipping company and educational courses from Maritime Education and Training Institution", "Any mental training on shore before contract is USELESS. Any mental training on board during the contact is very USEFUL"
Spiritual	S1	4	"Through my religion, I got helped to overcome negative impact by the COVID-19 pandemic", "Spiritual activities such as prayer, reading the Bible", "meditation"
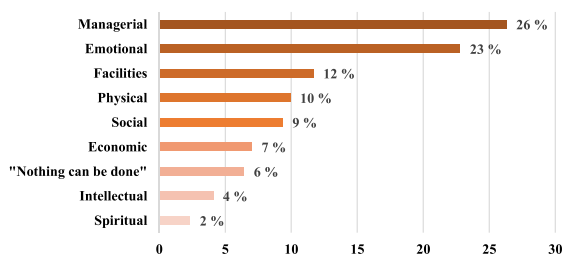
Fig. 4. Categorized factors helping to overcome negative consequences of COVID-19.

to overcome the pandemic situation. Availability of communication (code S1) and helplines (code S2) were associated with the "Social" category; these aspects were mentioned in 16 responses (9%); however, "helplines" was mentioned by only one respondent. The number of mentions (12 cases - 7%) in the category "Economic" (code Ec1) related to bonuses, additional payments/compensation shows that, although financial aspect is important for seafarers, in the case of the COVID-19 pandemic, additional payments do not help respondents to overcome difficulties. Eleven responses (6%) indicated some kind of hopelessness or inability to cope with the situation. They were categorized as "Nothing can be done", and represent the opinion that the COVID situation is a "global fate", or "uncontrolled situation", about which no measures could be taken and the only possible action is to wait for it to be over. Some responses (7 cases – 4%) categorized as "Intellectual" (code I1), were related to the role of education and training in helping to overcome difficulties. Finally, some people (4 responses – 2%) mentioned that prayers, meditation, and religion (categorized as "Spiritual") helped them to deal with the negative consequences of the pandemic onboard ships.

4. Discussion

The mental health and wellbeing of seafarers, although always an area of concern, has not been properly addressed and managed. Despite the incompleteness of data and scarce and fragmented evidence [13, 20, 32], seafarers have been consistently considered an occupational group vulnerable to the development of mental health difficulties. This vulnerability is mainly related to seafarers' exposure to a harsh working environment and living conditions. Moreover, the ways in which the maritime industry is structured, and seafarers' employment characteristics or business priorities have also been identified as wider influencers of health, safety, and wellbeing in this highly globalized industry [33].

The study includes a sample of active relatively young seafarers. The findings could be different if older seafarers, with longer seagoing experience, had been studied, as it could be hypothesised that they would show more resilience [34] and identify the effect of the pandemic as less important to their wellbeing. However, the opposite would be also valid as the longer exposure to the sea, the more vulnerable they could become. Our study shows that more experienced seafarers perceived their mental health and wellbeing as very or extremely impacted by the pandemic, meanwhile, the cadets (27% of the sample) perceived their mental health and wellbeing significantly less impacted by COVID-19 than officers and ratings, which could be explained by the cadets' low exposure to the life at sea. However, other factors related to the cumulative stress of seafarers who have worked in stressful situations for years could also be influencing. This aspect deserves further investigation.

Almost all participants considered mental health as a significant part of their general health. This reflects a historical intrinsic link between isolation, exposure to stress, and faraway feelings of seafarers and their working and living routines. The result in a sample of young seafarers probably indicates that talking about mental health is becoming more normalized, less taboo, and deserves equal attention to any other health aspect. The impact of this perception in a male-dominated industry is very positive because stigma in men is one of the factors most frequently associated with avoiding talking about mental health or using mental health resources and services [35].

The COVID-19 pandemic is bringing to the fore-front many societal and business limitations, and a healthy and safe workforce is becoming key to continue making industry models sustainable. In shipping, although affected as much as any other industry, especially the cruise ship and passenger industry, cargo and goods continue to be transported globally at the "expense of human cost", i.e. the sea-farers' health and rights. All seafarers stated that their mental health has been affected by COVID-19 (two thirds – very or extremely, one third – moderately). If working on board vessels is consistently described as one of the most hazardous occupations, adding extra risks, such as extended contracts, restricting access to shore welfare facilities, and lack of shore leave, compromises not only their wellbeing but also the safety of the work seafarers do. Previous research has revealed that lack of shore leave [20, 36] and voyage length and extension are aspects that are asso-ciated with high-risk of mental health issues [13, 26]. Due to COVID-19 these are some of the aspects more impacted by the pandemic, as indicated by first studies on the effect of COVID-19 on seafarers (i.e. Happiness index by Mission to Seafarers). Our study corroborates these preliminary results and also indi-cates that not getting ashore, length of the contract (unexpected extension/no relief as per contract), and unbalanced work and rest hours schedules are seri-ously affected. These three aspects highly influence rest and spare time of seafarers, and consequently fatigue, and are highlighted as key to their mental health and wellbeing, ordinarily[3]. Additionally, other aspects highly affected by the pandemic, which are also major contributors to seafarers' mental health outside COVID-19, include their relationship and communication with family and friends as well as with colleagues at work, and teamwork spirit. The negative impact of COVID-19 on the relationships between crewmates and the damage to social cohe-sion onboard has also been revealed by the Happiness Index published by the Mission to Seafarers (2020). The index provides a regular update about seafarer satisfaction with life at sea. As it captures input quarterly from seafarers, it is a very useful tool to monitor and benchmark the impact of COVID-19 on a range of issues such as mental health and wellbe-ing, working life, and family contact. The negative impact on social relationships on board as a result of the pandemic was confirmed in our study concern-ing both "morale" of seafarers and work activities requiring team skills and spirit, which could be exac-erbated by the lack of human interaction outside the crew. The negative impact of restrictive measures of COVID-19 on seafarers' mental, physical, social and economic wellbeing has been carefully detailed in a recently published qualitative research based on personal experiences from 752 seafarers [37].

The results of the investigation on factors help-ing to overcome the negative consequences of the COVID-19 pandemic revealed that management of the shipping companies can improve mental health and wellbeing of seafarers by the creation of a healthy workplace onboard the ship [38], by improving the physical and psychosocial work environment and applying the concept of positive psychology to sea-farers' lives to reduce the impact of stressors related to social, work-place related, and personal aspects [39–41]. The majority of the aspects identified by Kotrum [38], such as the physical work environment, personal health resources, and psychosocial work environment, and similar aspects identified as stres-sors by the American Club [41] (social, work-place related, personal, occasional circumstantial traumas), could be improved by the management of the ship-ping company. The respondents to the study named managerial, emotional and facilities-related (includ-ing Internet connection) factors as the most important in helping them overcome the difficulties during the COVID-19 pandemic: balanced work/rest hours, maintaining safety culture, providing accurate and timely information, offering support to seafarers and their families, clear organization of crew changes and access to internet. In particular, the provision of accu-rate and timely information by the management to seafarers and their families should be highlighted because, as stressed by Watkins [42], the mental health of seafarers is seriously affected by fake news

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[3]An extended version of the study described can be found on the Master's dissertation of one of the article's authors (see the previous footnote).

and misinformation about the impact of COVID-19, which is aggravated by social media. Shore- based personnel should be aware of the issues affecting crew mental health and contribute to their mental and social media hygiene. Our research findings confirm the conclusion of Sampson and Ellis [20] about needing proactive shipboard improvements to stimulate positive social interaction (with those on board and those ashore) and to improve opportunities for seafarers to relax, recharge and uplift their mood. It is doubtless that the effort of shipping companies and their management ashore could improve all mentioned factors.

This study indicates the underestimated importance given to education-related factors regarding the mental health and wellbeing of seafarers. The role of education in creating a positive atmosphere onboard and developing a healthy workplace has been identified by several researchers [15, 20, 43], However, the impact of maritime education and training (MET) on mental health and wellbeing awareness on different levels, such as part of the study program at educational institutions, different kinds of training activities in companies, and individual initiatives requires further investigation on a wider scale.

A further interesting issue to highlight is that the research results demonstrated that several respondents saw the pandemic situation as a "fate", or "disaster" and no measures could be taken to overcome the difficulties related to it. This idea could be understood in two perspectives: one – in a positive way - all factors were considered by the company, all precautions were taken; and in the opposite, negative way – nothing can be done at all to help to overcome the difficulties. Therefore, it can be assumed that some kind of hopelessness was felt by several respondents. This issue needs to be investigated further as well.

The limitation of this study is principally related to the median age of the sample, which represent a young sample with a relatively high proportion of cadets. Results are then more generalizable to a sample with similar characteristics, but not to older seafarers with longer experience at sea. The research was conducted 5 months later the pandemic had broken out, then during the first COVID-19 wave. While the effects of preventive measures relating to the COVID-19 pandemic (e.g., crew exchange problem, shore leave denial) were already impacting on seafarers' well-being, to what extend results can be generalized to posterior waves needs to further compare our results with other studies on the topic. Finally, it would have strengthen the study if additional scales measuring emotional states of respondents had been administered. We recommend future studies to increase the sample size, the variability of the sociodemographic characteristics of the sample and include questionnaires assessing seafarers' emotional states.

5. Conclusions

It is necessary to gather more data about factors that affect the mental health and wellbeing of seafarers as well as the real impact of COVID-19 on their health and safety. Potential solutions to lessen this impact, to protect seafarers' wellbeing, and prevent the development of mental health issues, should be built on seafarers' insights and experiences. Moreover, instead of reactive approaches consisting of sacrificing seafarers' mental health and safety to avoid disruption to the supply chain, proactive measures must be taken in line with UN SDG 3 on ensuring healthy lives and promoting wellbeing [44]. Apart from the adequacy of the measures governments put forward, coordinated, and effective management of mental health and wellbeing of seafarers is needed. Aspects seriously affected by the pandemic including crew changes and allowing shore leave and access to on shore welfare facilities are key for seafarers' wellbeing and safety, but also rest and work balance, family contact, social life, and work spirit on board.

The study recently conducted by Pesel et al. [45] revealed the excessive work-related stress experienced by seafarers during COVID-19 and its negative effect on wellbeing and proposed a preventive approach consisting of person-focused and organization-focused elements. Our work proposes a person-centered holistic approach that addresses the seafarer's mental health and wellbeing and, in line with Smith [46], is oriented to a better life for every seafarer. This approach should be preventive and aim to promote positive feelings and functioning as part of positive wellbeing in healthy workplaces [47] by addressing aspects related to communication with the external world, social life on board, and rest and spare time. During exceptional circumstances, priority should be given to managerial aspects, including proper management of information, continuous support for seafarers and families by the company, and the creation of positive work and social environment on board. Moreover, emotional and social support in addition to the shipboard communication infrastructure (e.g., internet connection) would be considered

essential to lessening the impact of conditions like the COVID-19 pandemic that expose seafarers to "extra" psychological stress. Appropriate mental health policies and management strategies can help to develop healthy workplaces onboard and maintain the balanced mental health and wellbeing of seafarers in daily routines. If properly managed, the pandemic could act as a catalyst for change with respect to their mental health protection and promotion under all circumstances, whether exceptional or ordinary. Furthermore, the role of MET in promoting awareness of mental health and wellbeing in seafaring as well as the voices of seafarers who show "hopelessness" with regards to changes in the industry, outlined in this study, call for further research.

Reporting guidelines

The manuscript adhered to the EQUATOR Network reporting guidelines for mixed method studies.

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Conflict of interest

The authors declare that they have no conflict of interest.

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