

COVID-19 AND AFTER: ABOUT HUMAN FACTORS AND WELFARE IN SHIPPING

MARIA CARRERA-ARCE

Lecturer (Research/MSEA)
World Maritime University (Maritime Safety and Environmental Administration)
Malmö, Sweden
e-mail: mca@wmu.se
Orcid: 0000-0001-9644-0315

RAPHAEL BAUMLER

Professor
World Maritime University (Maritime Safety and Environmental Administration)
Malmö, Sweden
e-mail: rb@wmu.se

JOHAN HOLLANDER

Professor
World Maritime University (Ocean Sustainability, Governance & Management Unit)
Malmö, Sweden
e-mail: joh@wmu.se

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Keywords

COVID-19 crisis, seafarers, well-being, welfare, human factors

Abstract

The COVID-19 crisis locked sea workers on their ships for extended periods. They have been deprived of their right to repatriation or shore leave. Their employment agreements were extended, medical assistance failed, and financial challenges affected them. The crisis revealed the lack of care for seafarers, which may have mid-term and long-term consequences for this population. The study elaborates on 54 in-depth interviews and confirms challenges such as downgraded working conditions, including high work-related stress and few opportunities for recovery, prioritization of commercial interest over well-being, limited or no signs of improvements in seafarers' well-being, and insufficient care for seafarers.

Additionally, the data indicates seafarers have been particularly resilient and adaptive during the crisis. However, the absence of care and respect combined with the insufficient recognition of their role after the crisis may seriously augment the intention to quit the occupation. Cooperation between the industry and authorities was deemed insufficient to protect seafarers' well-being and health globally. In conclusion, the COVID-19 crisis revealed the shipping industry's latent deficiencies in caring for seafarers. Interviewees agreed that the future of shipping depends on establishing a culture of care.

1 INTRODUCTION

When the World Health Organization (WHO) declared an end to COVID-19 as a global health emergency on 05 May 2023, the WHO Director-General, Mr Tedros Adhanom Ghebreyesus, stressed that the pandemic determines us “[...] to find the highest possible standard of health, for all people” (UN 2023) ... including sea workers.

However, the nature of their work positions them 'out of sight' and too often 'out of mind'. In their ships, sea workers are locked at sea for months, working 24/7, and having limited medical capacity assistance onboard (Pougnnet et al. 2020; Apostolatos et al. 2023).

The COVID-19 restrictions on travel have neglected these distance workers by prohibiting them from shore access, which forced them to stay on board without any visibility of the release or enjoy leave periods (De Beukelaer 2021a). Travel restrictions disrupted the crew change system, seafarers' overall welfare, and social security support (Han et al. 2023; De Beukelaer 2021b).

The situation impacted seafarers and families. Notably, the pandemic has accentuated occupational health and safety deficiencies at sea and crew welfare (Pauksztat, Andrei, Grech 2022; Bakhsh 2021; Clayton 2021; Shan 2022; Brooks, Greenberg 2022) and exposed seafarers to high stress, anxiety and depression, as widely documented (Carol-Dekker 2022; Carrera-Arce, Bartusevičienė, Divari 2022; Russtam Suhrab Ismail et al. 2021; Slišković 2020; Wong 2021; De Beukelaer 2021b; Kaptan, Kaptan 2021; Jonglertmontree et al. 2023; Lucas et al. 2021; Okeleke, Aponjolosun 2020; Radic et al. 2020; Mejia et al. 2021; 2022; Hayes-Mejia, Stafström 2023). Confronted with the crisis, governments and shipping industry failed to adopt proactive measures to address seafarers' mental health problems (Lin, Sarza 2024) despite the potential consequences of the pandemic impact on retention (Devereux, Wadsworth 2022; Lau, Kawasaki 2022; Erdem, Tutar 2022; Hu 2020; Kaur, Joy 2023; Wang, Miao, Feng 2023; Nguyen et al. 2023), and the shipping industry image (Chen et al., 2022; Lucas et al., 2023; Wang et al., 2023).

Research has reiterated the crisis's lasting impacts on the maritime workforce and the ongoing decline of seafarers' welfare after the pandemic. Recent maritime news suggests that "shipping maintains pandemic attitudes towards seafarers" after the crisis (Clayton 2023).

Out of sight, seafarers are feeling objectively out of mind. Beyond empty words, seafarers' efforts and sacrifices in maintaining the world trade afloat during the crisis and ensuring extraordinary post-crisis profits for their companies (Shen 2021; Murray 2022) have not been recognized by society and the industry.

Furthermore, chronic issues such as excessive workload and fatigue in shipping (McVeigh et al. 2019; Galić, Sić, Slišković 2023; Rajapakse, Emad 2021), which heightened during the pandemic (Shan 2022; Pauksztat, Grech, Kitada 2022; Ozabor et al. 2023; Zhao, Tang, Wu 2023), peaked in the immediate aftermath of the pandemic (Zhao et al. 2023). While COVID-19 restrictions were lifted, allowing free movement and certain stability (Wijaya 2023), essential seafarers' well-being features seem unaddressed. Extended periods on board, absence of shore leave, overwork and fatigue and feeling unappreciated are reiteratively reported (Safety4sea; The Mission to Seafarers 2023a; 2024; 2023b; 2023c)

The inability of the maritime community to address sea workers' well-being questions the implementation of the United Nations (UN) Sustainable Development Goals (SDGs) SDG 3 on health and well-being and SDG 8 related to decent work for this unique workforce. With this in mind, the study explores the overall impact of the pandemic on seafarers' working and living conditions and the opportunities and barriers for seafarers' welfare that became visible during the COVID-19 crisis.

2 MATERIAL AND METHODS

2.1 Research method

The research was conducted between May 2022 and June 2023 as part of the research project "Effects of COVID-19 panDEmic on sEafarers and shiPping" (DEEP). The study adopted a qualitative methodology involving 54 in-depth interviews with seafarers, families and maritime stakeholders. The researchers recruited the interview participants using purposive sampling¹ through researchers and the World Maritime University (WMU) maritime networks. Participants were selected based on 1) their direct exposure to the COVID-19 crisis (seafarers and families), 2) their experience in identifying and selecting the information-rich cases (maritime stakeholders), and 3) their willingness to participate and their ability to communicate experiences and opinions in an articulate, expressive, and reflective manner (all stakeholders).

¹ Purposive sampling is a nonrandom sampling technique that involves selecting the participants based on the qualities the participants possess and the researchers' judgement and research objectives.

In-depth interviews were conducted with seafarers (19) and families (6), allowing researchers to listen to their voices and collect experiences and feelings. The interviews lasted between 60 to 90 minutes. Additional interviews were conducted with 29 maritime stakeholders representing shipping companies, ship management, maritime administrations, regulatory bodies, insurance companies and classification societies, maritime training and education institutions, and welfare and health care provider organizations. These interviews usually lasted around 30-40 minutes. As for seafarers and families, the research allowed maritime stakeholders to detail their COVID-19-related experiences so that researchers could explore the subject in detail and its complexity.

The questions were designed to widely explore the interviewees' experience during COVID-19, the lesson learned from the period and their perspectives on seafarers' conditions in the future. Two specific questions were asked and analyzed for the current paper: 1) What is the vision of the future of seafarers' conditions in the shipping industry? and 2) What are the positive or negative aspects that the COVID-19 crisis revealed about the shipping industry? The thematic analysis examined significant patterns within the data collected (Braun & Clarke, 2021).

The data analysis used qualitative software (Atlas.ti version 23). The Research Ethical Committee of the World Maritime University approved the research protocol (# REC-22-99(R)). Participants signed the consent form before being interviewed, which implied anonymity using the interview content.

2.2 Data collection and analysis

The seafarers' participants included five masters, two chief officers, seven first/second engineers, and five junior officers (four from deck and one from engine department). The mean seafaring experience of the sample was 13 years (ranging from 3 to 26 years). Seventeen seafarers were males, and two were females. The mean age of the seafarers was 35 (ranging from 28 to 52 years), and most were married with children. Eleven seafarers were from Asia-Pacific countries (India, Philippines, Indonesia, China, China/Taiwan), four from Eastern Europe (Georgia, Ukraine, Russia), three from Northern-Western Europe (Sweden, France) and one from Southern Europe (Greece). Most (13) worked for the liquid bulk segment, while three worked on dry bulk carriers, two on cruise ships and one on multi-purpose vessels.

Out of 19 seafarers, only four had a permanent contract, while the rest worked on a contract basis. Four seafarers were not on board when the pandemic broke out in March 2020. Of these four, one worked shore-based but joined a vessel for a single contract. The remaining three were at home on leave, and while one joined a vessel without delay, the other two experienced a waiting time of eight and 12 months till they got a new contract. The remaining 17 were on board. Except for three seafarers sailing in Europe at the time; 14 suffered a contract extension between one and eight and a half months (mean=4.6 months).

The seafarers' families included five seafarers' wives and one sister. All were female, with a mean age of 39 (between 26 and 48). Three seafarers' families were from Asia-Pacific countries (Philippines, Malaysia), and three were from Europe (Romania, Sweden, and Georgia). All the interviewed family members, except one, were separated from the seafarers for extended periods during the pandemic because of the extension of the seafarers' contracts.

The maritime stakeholders (MS) who were interviewed represented several shipping segments, including shipping companies, ship management and industry associations (6), maritime administrations (6), welfare and health providers organizations (4), maritime training and education institutions and professional associations (3), regulatory bodies (2), insurance companies (2), classification societies and survey companies (2), unions (2), and service providers (1).

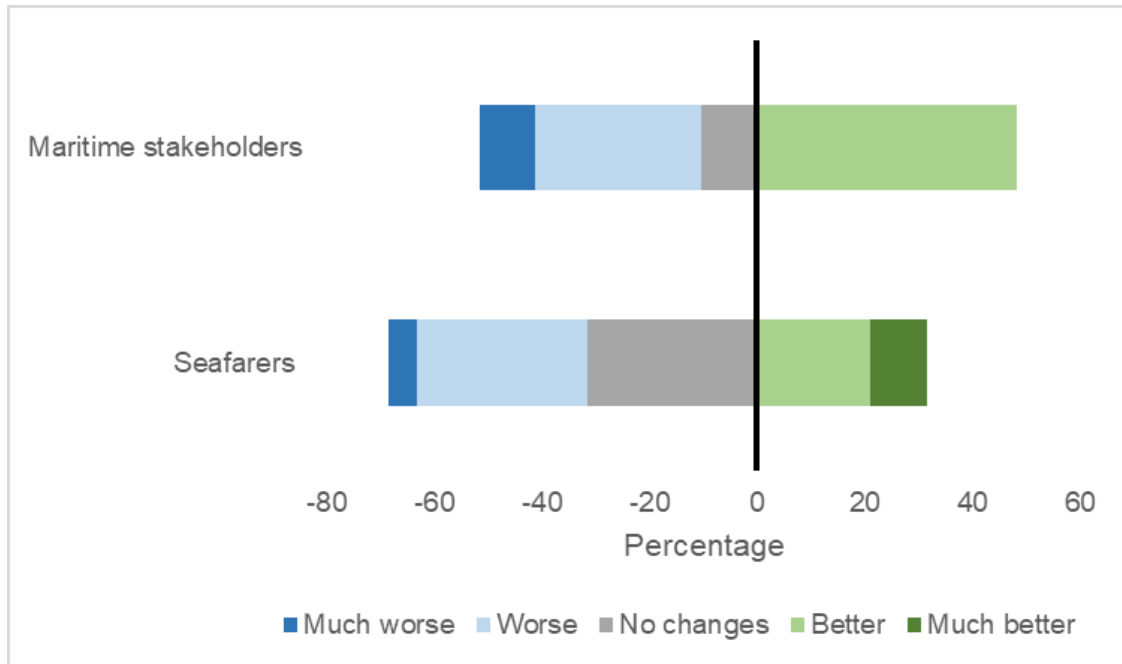
Twenty-four maritime stakeholders were males, and five were females, with a mean age of 36 (ranging from 29 to 67 years). Fourteen maritime stakeholders were from Asia-Pacific countries (India, Philippines, China, Singapore, Australia), nine from Northern-Western Europe (UK, France, Belgium, Germany, Netherlands, Sweden), four from North and Central America (United States, Panama) and two from Eastern Europe (Lithuania, Latvia). Nineteen had a seafaring background (mean=10.2 years of seafaring experience)

3 RESULTS

3.1 Shipping evolution for seafarers' profession

The interviewees (seafarers and maritime stakeholders) were asked to rank their vision of the future of seafarers' conditions in the shipping industry. The results show seafarers are far less optimistic about improving their working and living conditions than other maritime stakeholders (see Figure 1).

Fig 1. Interviewees' ranking to the question: Do you think shipping is becoming a better, a worse or the same industry for seafarers?



Note. Rank between 1-much better to 5-much worse.

The different themes that emerged from the interviews concerning the future of seafarers are described below and classified into four categories.

3.1.1 Higher work-related stress and fewer opportunities for physical and mental recovery

Seafarers highlighted that high stress related to work and fewer opportunities to recover physically and mentally from a stressful work environment is becoming unmanageable and potentially unacceptable. One captain, for example, said:

"[...] everything is becoming very complicated because if you compare the shipping now and 50 years ago, it is totally different because maybe 15 years ago you can stay even one year on board and nothing is changing because all the regulations were very simple, but now and for the time being this ISM system this paperwork is too much and especially for top officers they are becoming too tired, too stress." (Seafarer 16)

Seafarers consider that "everyone always demands more from ships" without looking at the work implications of such demands on permanently reduced crew. New regulations, paperwork and non-stop company requests jeopardize seafarers' work/rest balance and generate acute stress. Another captain corroborated:

"You need less pressure because you know all shipping industry stakeholders and organizations...PSC, class surveyors, everyone, keep pressing and keep pressing. Once, a surveyor told me that everyone sees the vessel as a fat cow and tries to drain out the milk. They, everybody wants, but no one gives, unfortunately." (Seafarer 5)

Recent studies have all concluded the increasing work-related stress due to work pressure and paperwork, compounded by the ever-reducing staffing onboard, is one of the most significant changes perceived by seafarers in the shipping industry, affecting them negatively (Pesel et al. 2020; Qin et al. 2021; Wong 2021; Zhao, Tang, Wu 2023; Zhao et al. 2023; The Mission to Seafarers 2024; 2023a; 2022).

3.1.2. Systematic prioritization of commercial interest over well-being

Participants stressed the systematic prioritization of commercial interest over well-being in alignment with previous studies (Devereux, Wadsworth 2022), affecting the feelings of hopelessness about positive changes for the betterment of seafarers among seafarers and some stakeholders. A welfare association representative stated:

“Seafarers were still left to sail for a number of contracts, and charters had an active role in that. So again, look at how they can be more seafarers friendly, not just the commercial aspects; they need to look into that part as well. I feel that was something negative, and I feel it is still there.” (MS 22)

Maritime stakeholders and seafarers concluded that a competitive market determines seafarers' welfare by focusing on costs, not humanitarian and human rights values. One first engineer who quit his seafaring career during the COVID-19 elaborated on his pessimistic view concerning seafarers' welfare:

“If I look at the whole big picture, I don't see much changing in the near or long term. [...]. So, nothing will be done just because it's a good thing. In the end, it needs to be financially viable. Improving seafarer welfare beyond a certain level may not be financially viable.” (Seafarer 2)

The WMU-ITF report (Ölcer et al. 2023) confirmed the absence of companies' willingness to promote maritime personnel. The industry's profit orientation hinders the sector's willingness to see people as resources and invest in them. Consequently, current management practices will obstruct seafarers' well-being improvements without a paradigm change (Van De Sande 2022) and cultural shift.

3.1.3. Limited or no signs of improvements in seafarers' well-being

Not all participants agreed that the industry could change. However, they agreed that a better future in shipping depends on paying attention to seafarers and establishing a caring industry, addressing its structural flaws.

Among the recent positive changes, the participants stressed improved virtual connectivity (i.e., allowing more frequent contact with families). Certain stakeholders also indicated some investments in maritime staff, including mental health, but noted that overall change may take long time. One seafarers' health service provider said:

“[...] changes have been made; they are happening. And that's not wishful thinking. It's reality. A lot of companies I work with are very much dedicated to mental health. They are reaching out to us constantly, and we work closely with them. They're actually training the seafarers. They're offering all this so, yes, it's getting better for seafarers. [...] But slowly, let's be realistic. It is not going to happen overnight. It will take years until the seafarers notice the effect.” (MS 7)

However, most interviewees recognized limited or no improvements in seafarers' well-being and saw the industry as over-communicative around seafarers' well-being without acting. One P&I representative, for example, said:

“There's like a silver lining that seafarers' mental well-being is now deserved or receiving the light it deserves. I'm not too sure. I think it's a lot of lip service. I'm not sure how much is really changing. Some things are changing; bigger ship owners are changing. But we still don't have public key worker status for seafarers, and a lot of countries, even those countries who have acknowledged key worker status are still not properly implementing it. So short-term, claims, I would say and heightened visibility of the importance of mental well-being on board. But if you then look at the long-term aspects, I'm not sure if that's going to stay.” (MS 3)

For most seafarers, the industry is not demonstrating an adequate commitment to addressing issues such as workload, fatigue, mental health, length of onboard stay, and shore leave (Inmarsat 2023; 2022; NSIA 2022; Pauksztat, Grech, Kitada 2022; The Mission to Seafarers 2024) This suggests there is more communication than actions. One seafarer, for example, stated:

“There are a lot of seafaring issues, as explained earlier, also regarding fatigue. I think these problems are happening not only during COVID but also earlier. We don't see any clear way where the industry is doing something on their side. I don't see any clarity that something has been done here for seafarers, or is there any interest also? I don't see that happening. No interest, No change not.” (Seafarer 9)

3.1.4 Insufficient implementation and power of regulations to protect seafarers

From a regulatory point of view, seafarers rarely mentioned improvements resulting from the MLC, 2006 (e.g., recording work and rest hours, recent amendments to MLC). Seafarers and maritime stakeholders criticized regulators because they failed to implement protective regulations. A shipowners association representative stated:

“I think that the regime of protecting seafarers as provided by Maritime Labour Convention 2006 is not as effective or adequate as I had expected, and this is what I had not been aware of before the pandemic that would be, let's say, like a negative impact or a negative consequence. [...]. Seafarers were actually in such a hopeless position and the Maritime Labour Convention failed to function as intended.” (MS 4)

Despite various attempts by international governmental and non-governmental organizations to protect seafarers during the crisis (ICS 2020; IMO 2020a; 2021; 2020b; 2020c; UN 2020; UN Global Compact 2021; Zarocostas 2020), these have shown limited efficaciousness in the view of participants, who repeatedly mentioned the global failure to recognize seafarers as key workers and treat them accordingly (Shan 2022; Athanasiou, Patsalides 2022).

Indeed, maritime stakeholders pointed out the key worker status as a well-intentioned but ineffective attempt to protect seafarers' welfare. It was only on paper, but they were never treated as essential workers, indicating no learning from the COVID-19 crisis. A P&I representative explained:

“It was really good that the Neptune declaration was put in place. Many companies, including us, signed up for it; I don't know how much it really helped. The IMO requested the key worker status for all the seafarers, but it remains up to the individual flag state to make sure that they actually put it into national law and that there are a lot of places where it was never done.” (MS 3)

Similarly, most seafarers claimed the disregard towards seafarers' jobs from the governments that can declare seafarers as key workers, as said by this captain:

“I don't see any value if you tell us that seafarers are key workers until and unless we are recognized as key workers by all the states and we are given that kind of status in terms of signing in and signing off. [...]. But what value does it hold if it doesn't do anything for the seafarers?” (Seafarer-9)

Furthermore, the pessimists point out that decision-makers from governments and the shipping industry escape their responsibilities and willingness to protect seafarers (Banta, Pratt 2022; De Beukelaer 2021b; Hebbar, Mukesh 2020; Shan 2022; Lin, Sarza 2024). A union representative explained:

“[...] that is all sometimes a little bit of blah, blah, blah, but then nothing happens. Like, these issues of very long working hours, extending contracts, crew shortages, fatigue, mental health concerns, job security, fair wage, people being blacklisted when they complain to us. All this is still there, and I don't see a decrease; every day, we get bombarded with seafarers' problems, with more and more problems. So even though efforts are always being made to improve the working conditions of the seafarers, there's so much work still to be done. So much, so I can't see, unfortunately, any improvement.” (MS 25)

3.2 What did COVID-19 reveal about shipping?

The interviewees (seafarers, families and maritime stakeholders) were asked about the positive or negative aspects of shipping revealed during the COVID-19 crisis. Several themes relevant to the question emerged and were captured under four main categories (see Table 1).

Table 1. Categories and themes

Seafarers' successful adaptation (+)	Seafarers' insufficient recognition (-)	Seafarers' intention to quit (-)	Insufficient cooperation industry-
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			authorities (-)
Importance	Bad treatment	Job instability	Importance of cooperation
Resilience	Poor respect	Psychological impact	Low cooperation
Professionalism	Poor care and attention to health/well-being	Seafarers always have a job (+)	Failure in cooperation

Note. (+): positive impact, (-): negative impact.

3.2.1 Successful adaptation of seafarers to extraordinary circumstances

Above all, the crisis revealed the impressive seafarers' resilience. Indeed, they have successfully adapted to exceptional circumstances, keeping the world trade afloat (Jie Ying Chua et al. 2021; Kay et al. 2022). One NGO -industry representative, for example, said:

“What it has revealed is that everybody has to one way or the other agree to this, but in very subdued voices is that the people are the most resilient factor behind moving the supply chains. And they did continue to do that without any disruption and against, I think, all odds. So, we need to be sure that what we give them back is equal.” (MS 6)

Most participants stressed the vital role of the seafarers in the maritime response to the COVID-19 pandemic, like this captain:

“This is also positive for me when the COVID-19 happened. We recognize or know the importance of the seafarers and the importance of seafarers for shipping. Seafarers are important to keep the industry running, right? Yes, the value of seafarers, that the industry needs seafarers.” (Seafarer 8)

Seafarers' commitment, resilience and professionalism continuously preserved maritime trade from disruption contrary to other businesses, as highlighted by most interviewees. A captain elaborated on seafarers' endurance:

“Seafarers are the most adaptive people in the world; we can adapt to all situations. Every day on board is different, right? So that's why we are very adaptive.” (Seafarer 16)

3.2.2 Insufficient recognition of the role of seafarers

Unfortunately, industry and society have not recognized the role of seafarers sufficiently. Lack of recognition pictures an indifferent work environment for seafarers (Wu, Gu, Carter 2021; Devereux, Wadsworth 2022; Osler 2020; Chen, Chen, Ye 2022). The majority of participants highlighted the indifference shown towards seafarers' role, as exemplified by two seafarers' families below:

“I already sort of know how they're treated and the conditions under which they work, the pressures, the expectations, the workload. But I suppose what COVID-19 revealed was that, indeed, they are not treated in the way that they should be. There was no effort on the company's part or the industry to look after seafarers. [...] I guess COVID just cemented the fact that it's almost like 'these people working or doing these jobs are unworthy'.” (Family 3)

“It showed a lot of how the companies really don't take care of their employees; this is one thing: how badly they were treated. And another one is also this aspect of how different countries don't really, like if you're not in the country, then “we don't care about you”. So, if you're on a ship, you're sort of in between, and it was very difficult because some of her colleagues couldn't go home; nobody wanted to take care of them. And that was an aspect that showed that when you're in the shipping business, you are sort of in between countries, which can give you a lot of trouble. You're almost stateless, where do you go if you get sick? There's nowhere to go.” (Family 2)

Although a few participants saw that more attention was given to the seafarer's role, the consensus was that low respect was and is still paid to the seafarer's profession (Song et al. 2021). A captain, for example, declared:

“COVID-19 proved to me that I was right. I would not get enough respect as a seafarer.” (Seafarer 5)

3.2.3. Failure of care and respect for seafarers and consequent intention to quit

All participants stressed that care and respect for seafarers failed. One chief engineer emphasized this idea:

“There is no special attention from the government to give care to seafarers; they only gave us some tax decrease. [...] The health of us cannot be guaranteed.” (Seafarer 17)

Consequently, COVID-19 became revelatory for seafarers who, for many of them, expressed their intentions to quit. For example, two engineers (Indian and Indonesian) explained how COVID-19 was determinant in their decision to quit:

“But I've decided not to go back to sea anymore. It's something that I've had the realization that seafarers will not be really looked after; when it comes to these things, we will not have the care that we deserve. And I don't think it is going to change in my lifetime. So, the best thing to do is not to be a part of the community.” (Seafarer 2)

“I think it is affected, because no shore leave makes me feel like, what happened if I get through this again? Will I be that strong again to stay on board? Or not? Get what happened if I'm not strong enough.” (Seafarer 14)

The majority of the maritime stakeholders, including management company and regulatory bodies representatives, corroborated the impact on seafarers' retention:

“[...] and negative of course, the health of the crew, what we see that many seafarers now they don't want to go at sea because of this impact, so that is a very big negative impact.” (MS 8)

“I'm coming back to the welfare because what we observe and what has been reported quite a lot in the literature and scientific literature since COVID, it's also a feeling of it's affecting their well-being in general, there is a problem of mental health, which is not declining, which is increasing. So mental health is becoming more visible than ever, and retention and working on different projects then when we can see retention is becoming very serious.” (MS 16)

A few seafarers stated that while in other professions, people lost jobs, thanks to being a seafarer, they have income to sustain their families. However, for most seafarers, the unstable working conditions of the profession became more visible (Devereux, Wadsworth 2022). A Filipino third engineer complaint:

“Negatively, because a seafarer must not only have his entire salary source from seafaring, he must do other jobs in order to sustain his financial and social position.” (Seafarer 6)

3.2.4. Insufficient industry-authorities cooperation to protect seafarers' well-being and health globally

The lack of international cooperation amid the pandemic has been reported (Zhou et al. 2023). A few participants praised the collaborative efforts between certain countries and industry. However, relationships between the industry and authorities were deemed insufficient to protect seafarers' well-being and health globally. A class society surveyor argued the failure of collaboration:

“It also made me realize that when this pandemic and things that even though we talk about working together and finding solutions together, when I look at the plight of the seafarers, I didn't find it, it also made me realize that we were not able to kind of work together and find a solution together.” (MS 2)

Indeed, interviewees presented cooperation as a failure and the main lesson learned from the pandemic. Cooperation instead of competition should guide any efforts to improve the safety and well-being of seafarers, as stressed by a shipping company representative:

“We should learn how to collaborate better. Now, even with different shipping lines, with institutions locally, with our foreign counterparts. So, at the end of the day, there's no competition for safety. There's no competition in well-being [...]. We have a completely entrenched interest in terms of commerce or our business, but we have the same objective to ensure that our colleagues are on board our ship or other ships to be safe.” (MS 1)

4 CONCLUDING DISCUSSION

In conclusion, COVID-19 revealed the chronic neglect of sea workers. The industry has remained the same. The pandemic has revealed latent deficiencies that have become more visible and recognizable than ever.

The weak integration of human factors and welfare into regulations and practices and the occupation instability deeply affected seafarers and families. Their lives and well-being were compromised, revealing the structural disregard for those working at sea.

Sharing and collecting (good and bad) experiences provide the necessary feedback mechanism to better prepare and cooperate in future crises. Therefore, acknowledging the seriousness of the situation is a must. It is also the condition to identify suitable solutions for the long-term sustainability of the shipping industry. The government and intergovernmental organization must demonstrate their support by enacting and implementing effective regulations.

“Walking the talk” will require questioning and altering seafarers’ working and living standards and demonstrating recognition. To remain in the occupation, seafarers expect recognition demonstrated through visible acts, particularly in incomes, enhanced living and working conditions, job security and career opportunities. Additionally, they deserve a better work/life balance, allowing additional time with relatives and visible attention to their health and well-being.

Working towards integrating human factors and social welfare into industry practices will preserve the resilience necessary to overcome any future disruption.

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