

Impact on seafarers of extreme events: A case study arising out of the situation in Ukraine

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ABSTRACT

Background: Maritime transportation is the lifeblood of the world's economy. However, seafarers are exposed to isolated, confined and particularly extreme environments. Maritime operations in the face of geopolitical conflicts profoundly impact seafarers' mental health, well-being and safety.

Materials and methods: The study comprises 27 seafarer interviews and 21 stakeholder interviews covering 4 maritime education and training institutions, 11 crewing agencies, 4 medical facilities and 2 maritime authorities. An online questionnaire survey of seafarers who were affected by the conflict in Ukraine and had sailed in the conflict zone in the period 24 February 2022 to 30 September 2023 yielded 319 valid responses.

Results: The study suggests that seafarers in the conflict zone are exposed to constant imminent threats to personal safety, constant stress and anxiety, prolonged lack of sleep, limited opportunities of contact with families, and high risk to mental health among other things further exacerbated by a lack of mental health support from company, and anxiety resulting from loss of access to shore-based training facilities and uncertainty in updating competency certificates.

Conclusions: The study presents rare insights on the psychological and emotional toll on seafarers who continue to serve the critical needs of the maritime transportation industry in a newly ordained role as keyworkers. This study underscores the need for improved mental health support and counselling services within the maritime industry, in particular, maritime stakeholders likely affected by geopolitical conflicts.

Highlights: From the practical perspective, this is among the first studies to focus on the mental health and well-being of seafarers arising out of the situation in Ukraine since 24 February 2022. From the theoretical perspective, this is a maiden study attempting an exploration of social conditions in three different dimensions by integrating three distinct theoretical constructs namely, UN Human Security Framework, Holmes & Rahe Social Readjustment Rating Scale and ILO Maritime Labour Convention framework.

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Keywords: seafarers, mental health, well-being, maritime safety, extreme event, geopolitical conflict, Russia-Ukraine conflict, UN Human Security Framework, Holmes & Rahe Social Readjustment Rating Scale, Holmes & Rahe Stress Scale, ILO Maritime Labour Convention, MLC

INTRODUCTION

The world has witnessed a series of extreme events that significantly impacted various aspects of the society, economy, and global security [1]. Extreme events can profoundly affect seafarers causing added stress due to

unpredictability [2], significant mental and emotional distress due to extended employment contracts [3], impacting on long-term mental health, emotional state, and physical well-being [4], uncertainty due to irregular communication with loved ones [5], and impact general well-being [3].

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Among extreme, unforeseen events, the global financial crises, COVID-19 pandemic, and Russia-Ukraine conflict have emerged as significant disruptors with far-reaching consequences.

Prior to the COVID-19 pandemic and since the end of World War II, there have been five global downturns. The global financial crisis of 2009 devastated the shipping industry. Demand for shipping services plummeted by 9% [6] resulting in declining ship values, fleet downsizing, delayed maintenance and safety risks, etc. [7]. To seafarers, these industry shifts meant a grim reality: job losses or long stretches at sea with fewer crew members [8].

The COVID-19 pandemic's effects on shipping resembled an unseen maritime hurricane [9]. With quarantine measures, border closures, and travel restrictions in place, unfolded the crew change crisis [10]. Many seafarers were literally left 'stranded at sea' serving for extended periods without shore leave under an extended contract they did not will or haplessly quarantined somewhere between their ship and their destination [11]. Meanwhile, shipping companies' investment in training diminished [12]. Seafarer safety was also put in jeopardy [13]. They were to endure shortage of personal protective equipment, complicated and uncertain repatriations, restrictions in accessing medical care ashore, and inadequate hygiene practices which put their well-being at significant risk [14]. This led to calls for, among other things, institutionalising psychological healthcare for seafarers [15].

Seafarers comprise a workforce of 2 million worldwide, and their vital function in smooth running of the shipping industry cannot be overstated [16]. On the other hand, studies have shown that seafarers face intricate health and safety challenges due to their work at sea, which ranks amongst one of the most dangerous occupations [17, 18]. Despite sporadic "unusual" occurrences, there appears to be a lack of adequate regard for their mental and physical welfare and basic human rights [19]. Even though seafarers are recognized as "key workers" by the United Nations, pandemic's job challenges hit them particularly hard. Financial difficulties stemming from agreement extensions, lower wages, and unpaid salaries prevailed and with little recourse to redressal, many seafarers faced exploitative work practices and dangerous working environments [20].

For the seafaring industry, which has endured numerous turbulent periods throughout history [21], the conflict in Ukraine exacerbated their plight even further. Challenges to daily operations in the Black Sea ports since presented knock-on effects for crew [22]. The conflict has had a devastating impact on the maritime education and training infrastructure of Ukraine, and thereby impacted the education of Ukrainian seafarers [23]. The uncertainty faced by Russian and Ukrainian crew members accounting for 10.5%

and 4% of all seafarers respectively knew no bounds, as they remained unable to leave their vessels or return home [24]. About 2000 seafarers of 27 nationalities were stranded on 112 vessels when the conflict broke out on 24 February 2022 and, over 330 seafarers remained stranded on 62 vessels well after a year into the conflict [25]. While some crew replacements were made through local ship keepers, and some ships went into cold layup without any personnel on board, some situations called for the crew to serve on board ships, stranded in Ukrainian ports or operating services in the war-torn Black Sea region.

Seafarers are typically exposed to several stressors that impact their mental, psychosocial and physical health [26] and poor mental health of seafarers is often fatal [27]. Yet, gaps persist in research on mental health and well-being of seafarers [28]. Seafarers stranded in Ukrainian ports have been the subject of discussion in various international organizations; however, systematic studies into the physical and mental well-being of seafarers stranded in a geo-political conflict appear to be lacking. This research, therefore, investigates the impact of extreme events on seafarers, particularly those affected by the geopolitical tension in the Russia-Ukraine conflict. In particular, this research examines the impacts of the conflict on seafarers with respect to: their physical and psychological well-being; stakeholder response to address their needs; compliance of safety training, drills and exercises; and, continuity of services by maritime education and training institutions.

MATERIALS AND METHODS

The United Nations' Human Security Framework [29, 30], can provide a holistic perspective on the impact of the Russia-Ukraine conflict on seafarers involved in maritime operations. Of the seven aspects in the framework, four dynamics [30] namely, fear (maritime security concerns), hazardous conditions (environmental and physical hazards), access to opportunities and human rights are of particular relevance for the current research.

The Social Readjustment Rating Scale [31] is a useful tool to measure the effect of various life events on an individual's well-being and health. Of the 43 life events in the scale derived from clinical experience, and applicable to maritime [32], at least nine attributes are relevant to seafarers in a geopolitical situation.

The ILO's Maritime Labour Convention, 2006 [33] comprehensively addresses the well-being of seafarers in numerous areas of working and living conditions on board a vessel [19].

MLC 2006 is the most potent tool regarding seafarer's rights; it sets out seafarers' rights at work, including employment terms, health and safety, living and working conditions, access to medical care, and social security. Under MLC,

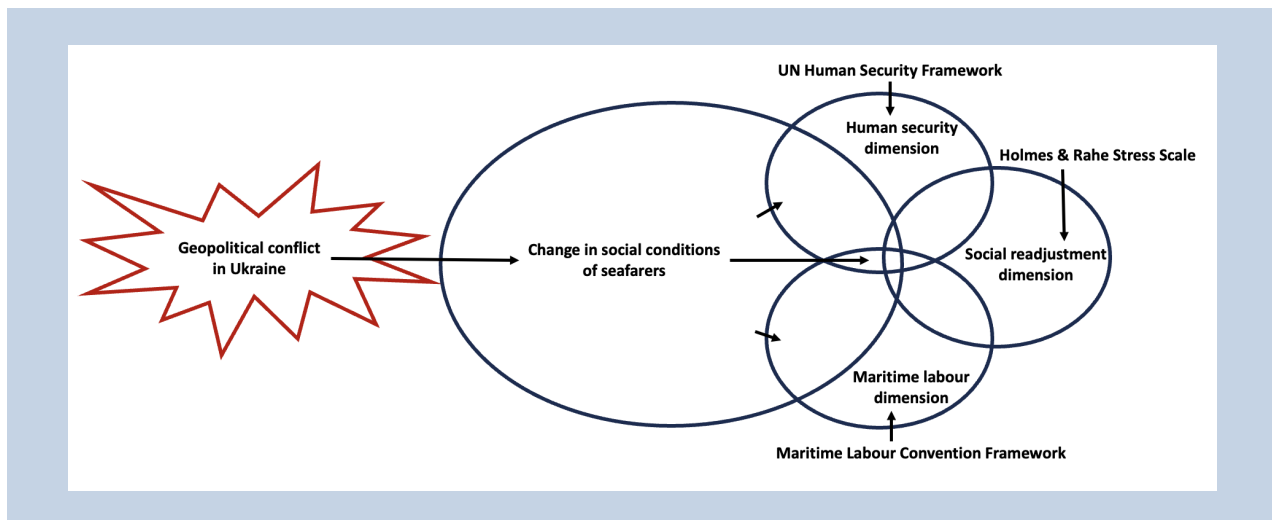


Figure 1. Conceptual framework for the study

seafarers are entitled to reside, work and train on board in safe and healthy surroundings. A ship must take reasonably protective measures against accidents, injuries and illnesses on board. Also, a ship must have a health policy or program, as well as risk assessment and continuous health and safety education. A seafarer shall have the right to abandon ship or to disembark from it if there is a reasonable apprehension of threat to safety of life or health on board [33].

The conceptual framework for the study, therefore, is the intersection of the attributes comprising UN Human Security Framework, Holmes & Rahe Social Readjustment Rating Scale and IMO MLC 2006 that are collateral to seafarers in a geopolitical conflict (Fig. 1). The individual attributes in each of the three dimensions namely, human security, social readjustment and maritime labour are enumerated in Tables A1–A3 respectively at Appendix A.

The attributes are explored using a mixed-methods approach, combining quantitative and qualitative data collection and analysis methods.

Data collection tools comprised an online survey and in-depth interviews from June–September 2023.

The online survey and interview questions focused on the following areas: seafarer’s experiences of the conflict in Ukraine, the impact of the conflict on seafarer’s physical and mental health, seafarer’s perceptions of safety at sea and the impact of the conflict on safety measures and protocols, seafarer’s perceptions of safety training and preparedness, and seafarer’s perceptions of medical care and support from shipping companies and industry stakeholders.

The online survey was targeted at Ukrainian and other seafarers who had directly experienced the conflict while serving on board in the conflict zone. The survey was distributed through social media platforms and Ukrainian seafarer organizations.

The interviews were conducted with a purposive sample of seafarer’s on board ships: at three ports in Ukraine that were open to ship calls – Odessa, Izmail, and Reni; and four other ports closed for shipping – Kherson, Mariupol, Skadovsk, and Berdyansk. The interviews were conducted in Azerbaijani, English, Georgian, Russian and Turkish.

The data from the interviews is analysed using thematic analysis while survey data is analysed using descriptive and inferential statistics.

The online questionnaire was viewed by 1308, and completed by 319 seafarers from ten countries – Ukraine, Georgia, Russia, Turkey, Azerbaijan, Bulgaria, Philippines, Egypt, Ecuador, and Jordan. Only those seafarers who had sailed in the Black Sea Region during the conflict qualified for participation.

For the interviews, 91 seafarers and 46 stakeholders were approached, and the participants comprised 37 seafarers, 11 crewing agencies, 4 medical institutions, 4 maritime training centres and 2 maritime authorities. The interviewed seafarers were citizens of Ukraine, Russia, Georgia, Turkey, and Azerbaijan. Among the main reasons cited by seafarers for declining the interview invitation was a fear to discuss matters which could affect their employment and also because it was hard for them psychologically to recall the stress, they had been through.

RESULTS AND DISCUSSIONS

The results and discussions are organised under the thematic areas of the human security framework.

FREEDOM FROM FEAR

Freedom from fear is explored, within the human security framework, through seafarers’ experiences of personal safety during the conflict.



Figure 2. Freedom from Fear: Seafarers' experience of risk to personal safety during the geopolitical conflict in Ukraine: **A.** Situation when seafarers felt that their personal safety was at risk due to the conflict; **B.** Seafarers' perception of decrease in work performance compared to the pre-conflict normal

Geopolitical conflicts and maritime security concerns invariably raise questions about seafarers' safety. The Russia-Ukraine conflict has led to concerns about maritime safety. Tensions can foster a climate of fear and uncertainty among seafarers and operators.

Interviews with seafarers in the epicentre of the conflict, facing bombs falling on the vessels and on surrounding areas, revealed an extremely tense and grim situation (Appendix B). Further, of the 319 surveyed seafarers, over 70% felt that their personal safety was at risk due to the geopolitical conflict all the time or at least up to three times during their contract (Fig. 2A). 75% of the seafarers confirmed that their work performance had consequently declined as compared to the pre-conflict normal (Fig. 2B).

Regardless, most of the interviewed crew members serving on board vessels stranded in Ukrainian ports were free to leave, and not being held against their will. Moreover, it was not obligatory for them to fulfil their four or six-month term as contracted, yet most continued to work for 12 to 18 months on several occasions.

The interviewees further revealed that seafarers were receiving double the normal remuneration for bearing the imminent danger to their physical security. This introduced a more complicated dynamic, where freedom from fear was attempted to be offset with economic incentive. Since an opportunity to earn money can outweigh genuine concerns for one's own protection, a hapless sacrifice can result in terms of physical and mental health.

FREEDOM TO ENJOY HUMAN RIGHTS

Freedom to enjoy human rights, in the context of the human security framework, may be related to the psychological safety of seafarers in the conflict.

Psychological safety of seafarers is no less important than physical safety, especially during geopolitical crises. The online survey revealed the correlation between seafarers' beliefs about the essential elements of safety vis-à-vis their lived experiences during the conflict with sleep problems, worrying constantly, imagining worse, anxiety, and depression appearing on a high scale (Fig. 3A).

The study examined if and how psychological issues changed due to the conflict. It emerged that almost 70% of the seafarers experienced a higher level of stress/anxiety all the time, compared to the pre-conflict period while 21% experienced anxiety ranging from sometimes to very often. Overall, 95% of the participant seafarers experienced significant levels of stress/anxiety, at least once in their tenure (Fig. 3B).

Almost 80% of the respondents perceived that their mental health was compromised (Fig. 3C), which is understandable. Impacting the situation even further, a lack of direct access to a phone on the ship meant that they could contact their family far less often than prior to the conflict (Fig. 3D). Indeed, the conflict aggravated matters, resulting in less communication with family members, causing even more loneliness and homesickness. For seafarers already enduring separation from family for long periods, it became even more difficult to stay in touch with loved ones.

A particularly salient finding of the research was that sleep deprivation in seafarers can be one of the first signs of developing mental health problems such as anxiety and depression. Not only did it put their immediate wellbeing at risk but also exacerbated long-term mental health problems. Besides anxiety and depression experienced during the conflict, constant exposure to danger and isolation made it an emotionally challenging time for seafarers (Appendix B).

This finding reflects on the responsibility of the crewing/shipping companies to care for the wellbeing of seafarers. Majority of the seafarers (about 80%) on board vessels in Ukrainian ports during the conflict appear to have received little or no counselling or psychological support from ship-owners or crewing agencies (Fig. 3E).

On the other hand, four interviewed medical institutions (two each recognized by Georgia and Ukraine) suggested that although mental health mitigation measures such as books, brochures, and phone consultancy were in place, there was very limited evidence of its use by the crews. Seafarers rarely presented themselves to the recognized medical institution for a medical check on conclusion of their contract.

Seafarers were also surveyed on the level of support from crewing/shipping agency, which included provision of support to immediate family back in the residence country, provision of mental health support (books, calls and etc.). Whereas provision of support to immediate family from crewing/shipping agency was rated “good” by most seafarers (Fig. 3F), mental health support appeared to have a contrary outcome (Fig. 3G).

As regards recommendations going forward, 89% of the survey respondents and 92% of the interview participants shared the view that mental health training onshore before voyages would greatly assist seafarers in being mentally more prepared for any crisis event at sea (Fig. 3H).

FREEDOM TO ACCESS OPPORTUNITIES

The concept of freedom to access opportunities, in the context of the human security framework, was examined via access to various authorities for availing seafarer related services and access to the shore-based facilities for renewal of certificates’ during the conflict.

More than half of the respondents were unable to access shore-based training facilities to update/renew necessary certificates required under the STCW Convention (Fig. 4A). It has been practically impossible to renew certificates or any other documents in Ukraine, and so Ukrainian seafarers have been training abroad. Institutions in Poland and Georgia were mentioned as alternatives (Appendix B).

One issue was the renewal of training certificates as required by the STCW Convention and another was the ability to do so on time. Among the participants, over 50% were unable to renew their STCW certificates on time (Fig. 4B). Those who did confirm the ability to renew their certificates on time were citizens of a third country such as Georgia or Turkey. Reportedly, it could take up to about 9 months for a Certificate of Competency endorsement online while the Government of Ukraine strived to build the online process.

Georgia appeared to be partly filling the gap in the provision of seafarer services by Ukraine. For example, Georgian maritime training centres issued 203 Ukrainian seafarers with Seafarer’s Identification Document for renewing the certificates of proficiency during the period from 24 February 2022 to 27 July 2023 (when the data was obtained from the maritime administration of Georgia). Meanwhile, the Ministry of Infrastructure of Ukraine appeared to have extended the validity of Seafarers’ Identity Document until 31 December 2023 for seafarers on board vessels [34].

FREEDOM FROM HAZARDOUS CONDITIONS

The concept of freedom from hazardous conditions, within the human security framework, was explored through compliance of safety trainings, drills and exercises.

Compliance of safety trainings, drills, exercises, and meetings are crucial to maintain safety and prevent hazardous situations. Safety trainings on board could not be maintained at the same level as before the conflict (Fig. 5A). Without rehearsing the drills, trainings and procedures, crew will likely lose the ability to act on and respond to any safety issues, in an effective and efficient manner. Not maintaining the trainings on the vessel, exposed the crew to avoidable physical harm.

The study revealed that the workload of seafarers also underwent profound changes due to the conflict. Majority (almost 69%) of the seafarers reported impact of the conflict on their workload profile (tasks, responsibilities, duties, work/rest hours, etc.) (Fig. 5B). For example, a deck

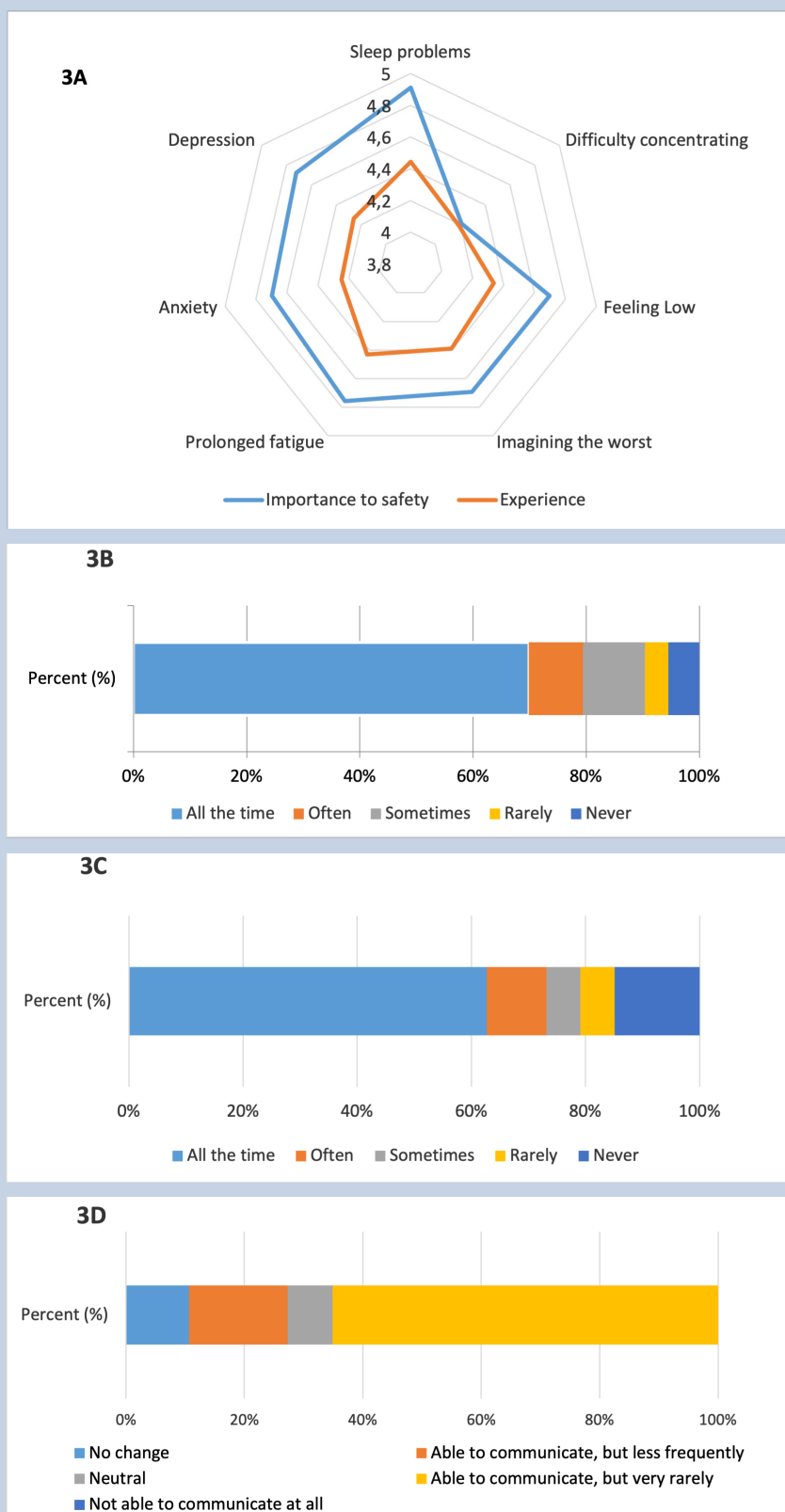


Figure 3. Freedom to enjoy human rights: Psychological safety of seafarers in the geopolitical conflict in Ukraine: **A.** Seafarers' beliefs about importance of essential elements of safety vis-à-vis their lived experiences; **B.** Frequency of seafarers' heightened level of stress/ anxiety compared to the pre-conflict normal; **C.** Frequency of situations where seafarers' felt that their mental health was compromised; **D.** Change in seafarers' ability and frequency of communication with immediate family

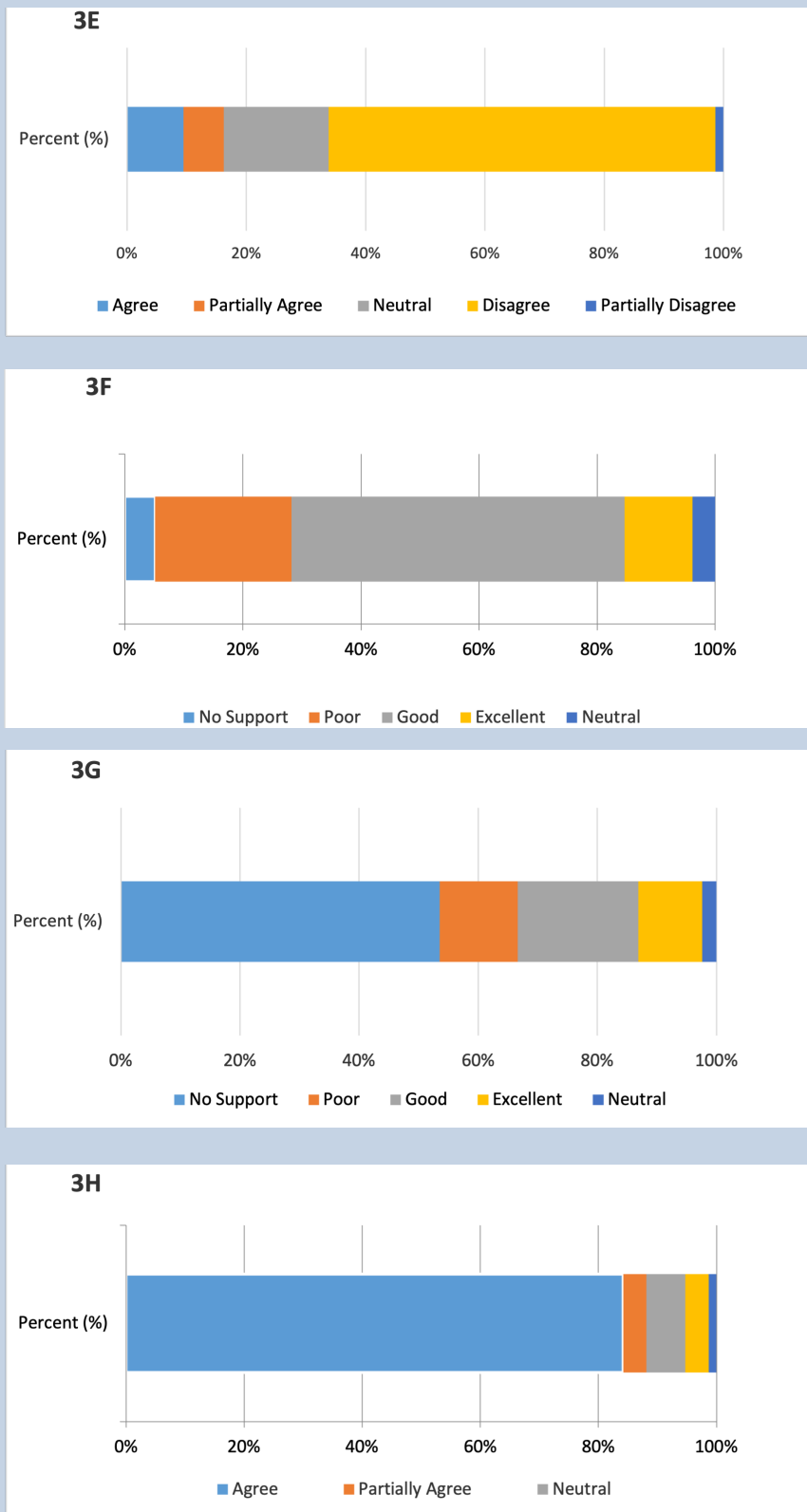


Figure 3. Freedom to enjoy human rights: Psychological safety of seafarers in the geopolitical conflict in Ukraine: **E.** Availability of mental health counselling support to seafarers; **F.** Company support to immediate family; **G.** Provision of mental-health resources to seafarers' by company; **H.** Participants' recommendation on pre-voyage mental health training onshore

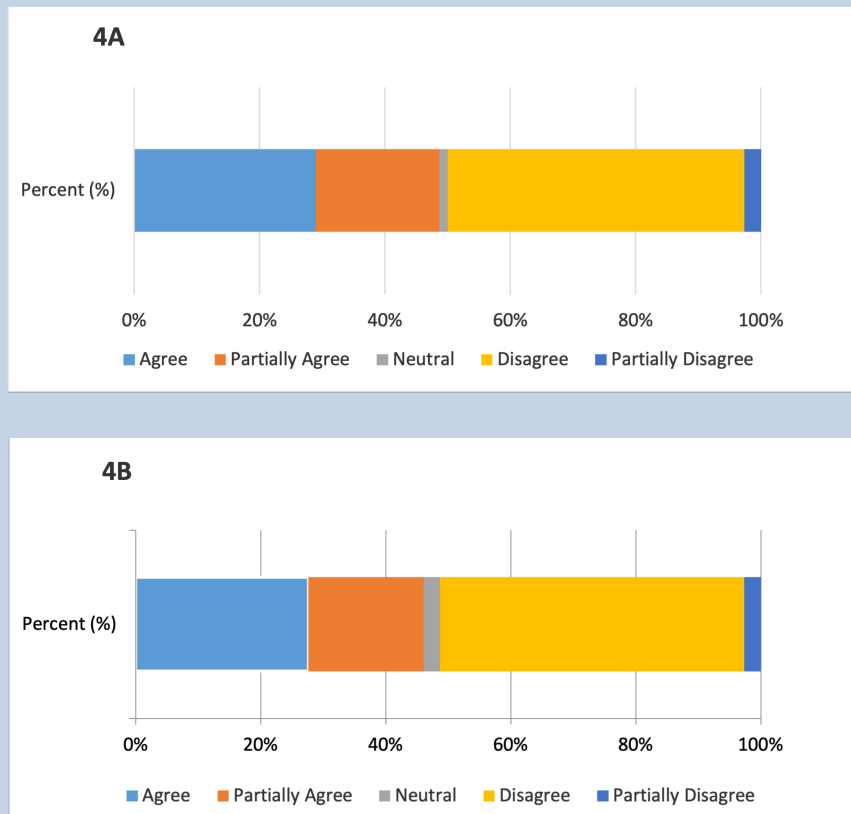


Figure 4. Freedom to access opportunities: Seafarers' access to facilities and services ashore during the geopolitical conflict in Ukraine: **A.** Access to shore-based training facilities for updating/renewal of STCW certificates; **B.** Timely renewal of STCW certificates by Administration

department officer was immediately ordered more watch keeping time and since port operations were not possible, seafarers were left with little or no duties and obligations (Appendix B). While being insufficiently occupied with work might seem like a good opportunity to rest, it also indicated that maintenance of safety measures is possibly not prioritized (Fig. 5C). Moreover, prolonged period of time with insufficient work has the potential to impact well-being, particularly when stranded in a conflict.

COLLATERAL EFFECTS

According to the results of the online survey, 73% respondents' families were affected by the conflict (Fig. 6A), especially from the parts of Ukraine, which were under Russian control.

On the other hand, it was very interesting to note that the conflict did not impact on seafarers' long-term career plans. Most respondents stated that they would continue to work at sea, despite of their experiences during the conflict (Fig. 6B).

As regards the benefit of a pre-contract training, to help seafarers in being mentally prepared for extreme events,

while it is understandable that no one was expecting geopolitical tensions before signing the contract, and no seafarer can be prepared for extreme events, respondents were largely unanimous in their opinion that trainings on mental health issues, contingency plan, and sequence of steps to be taken in case of an extreme event can be very helpful. (Fig. 3H)

RESPONSE OF INTERNATIONAL ORGANIZATIONS

Based on the literature reviewed, it must be highlighted that the amelioration of the condition of seafarers impacted by the situation arising out of the conflict in the Black Sea and the Sea of Azov was continuously sought to be addressed by institutions, including UN and IMO.

Consequent to the outbreak of conflict, UN adopted the Black Sea Grain Initiative (BSGI) in July 2022 with support and participation of Ukraine, Russia, and Turkey [35]. From July 2022 until it ended in July 2023, the Initiative helped ships make 1003 voyages from Ukrainian ports, including 35 that had been stranded since February 2022, thereby allowing the possibility of crew change and repatriation



Figure 5. Freedom from hazardous conditions: Safety compliance on board during the geopolitical conflict in Ukraine: **A.** Maintenance of safety trainings; **B.** Change in seafarers' workload; **C.** Maintenance of safety measures

of any seafarers stranded on board the vessels, qualified to take part in BSGI.

IMO, the specialized UN agency for maritime affairs, works more closely with regional stakeholders than ever before with a view to improve safety and security in the conflict zone. An Emergency Task Force formed under the IMO Secretary-General seeks to address security and safety risks affecting shipping, ports, and seafarers which is besides a form introduced for facilitating reporting

of stranded ships [36]. An extraordinary meeting of the IMO Council from 10–18 March 2022 urged several mitigation measures to address the impacts on shipping and seafarers from the Black Sea and the Sea of Azov situation including the following: condemning nationality-based harassment of seafarers; free access to communications with families for seafarers; provision of entitled wages; acknowledgement of seafarers as key workers; an exemption from mandatory military service; and adoption of flexible

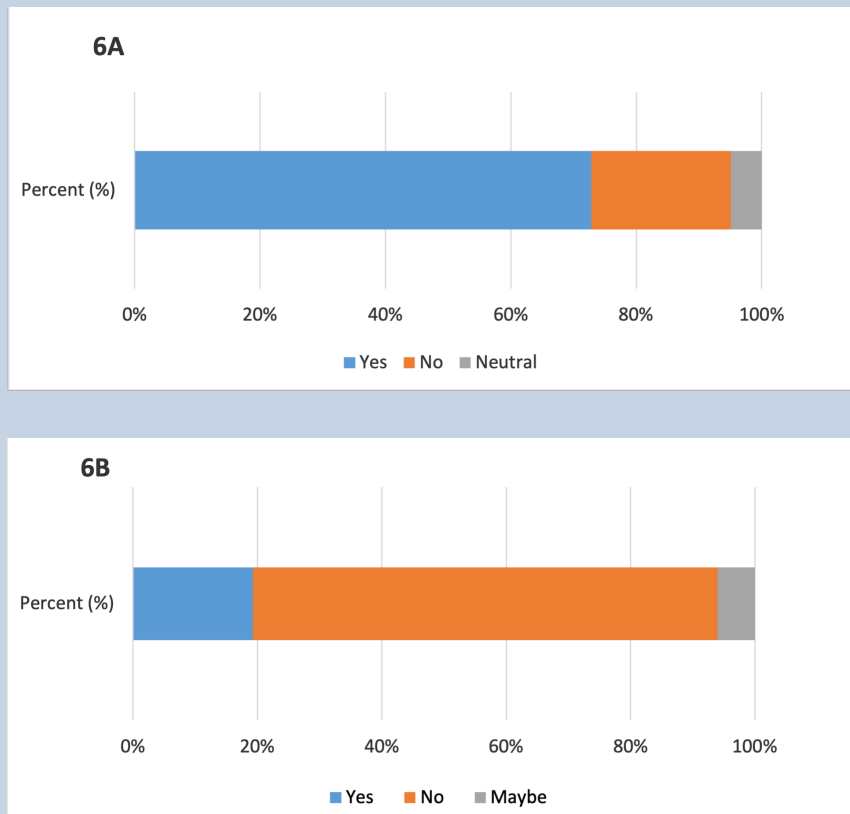


Figure 6. Collateral effects on seafarers of the geopolitical conflict in Ukraine: **A.** Collateral effects on seafarers' families; **B.** Collateral impact on seafarers' long-term career plans

strategy by Port State control officers when confronted with expired documentation, factoring in the exceptional context [37].

The International Transport Workers' Federation (ITF), connecting more than 700 affiliated trade unions from 150 countries to secure rights, equality and justice for workers' globally and serving as the voice for nearly 18.5 million transport workers across the world, appealed to the President of Ukraine, requesting permission for Ukrainian seafarers to leave the country [34]. A joint humanitarian project involving the ITF Seafarers' Trust, ITF, Maritime Transport Workers' trade Union of Ukraine (MTWTU), and V-Group helped families of Ukrainian seafarers to escape the conflict in Ukraine [38].

Further, MTWTU has been steadfast in defending the rights of Ukrainian seafarers. It appealed to the International Chamber of Shipping (ICS) and the International Maritime Employers' Council (IMEC) for Ukrainian seafarers on foreign flagged vessels to be provided with additional means of communication such as telephone cards, internet access and satellite communication facilities [39].

CONCLUSIONS

Overall, the results of the study suggest that extreme events such as a geopolitical conflict exposes seafarers to constant imminent threats to personal safety, constant stress and anxiety, prolonged lack of sleep, limited opportunities of contact with families, and high risk to mental health among other things further exacerbated by a lack of mental health support from company, and anxiety resulting from loss of access to shore-based training facilities and uncertainty in updating competency certificates.

The study presents rare insights on the psychological and emotional toll on seafarers who continue to serve the critical needs of the maritime transportation industry in a newly ordained role as keyworkers. Seafarers in the conflict zone in Ukraine were likely to be exposed to a cumulative stress of a very significant magnitude of 200 as per the social readjustment attributes in the Holmes and Rahe scale inventory relevant to maritime. This study, therefore, underscores the need for improved mental health support and counselling services within the maritime industry, in particular, maritime stakeholders likely affected by geopolitical conflicts.

From the practical perspective, this is among the first studies to focus on the mental health and well-being of seafarers arising out of the situation in Ukraine since 24 February 2022. From the theoretical perspective, this is a maiden study attempting an exploration of social conditions in three different dimensions by integrating three distinct theoretical constructs namely, UN Human Security Framework, Holmes & Rahe Social Readjustment Rating Scale and ILO Maritime Labour Convention framework.

It must be acknowledged that besides extreme unforeseen events such as COVID-19 and the geopolitical conflict in Ukraine examined in this study, seafarers also face a rather foreseeable risk of hijacking and maritime piracy and the attendant long-term impacts on psychological well-being [40] and mental health [41].

As for the limitations of the study, given the fluid situation, the results might not accurately reflect trends in maritime safety and long-term impacts, although literature suggests that psychological adaptation of seafarers subject to conflict would depend on their dispositional resilience [42], a topic which appears to have received sparse attention in the civilian maritime sector [43]. Further, the overlapping impact of COVID-19, and wider economic, political, and environmental impacts were not explored in this research and would merit a separate study.

ARTICLE INFORMATION AND DECLARATIONS

Data availability statement: Data is available with the researcher.

Ethics statement: The research was approved by the Research Ethics Committee of the World Maritime University.

Author contributions: Anish Hebbar – conceptualisation, methodology, resources, writing – review and editing, supervision; Teona Khabeishvili – conceptualisation, methodology, resources, writing – initial draft, data collection and curation.

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Conflict of interest: None

Supplementary material: None

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APPENDIX A: TABLE OF ATTRIBUTES OF THE THEORETICAL FRAMEWORK FOR THE STUDY

Table A1. Human security dimension attributes

Human security dimension	Human security dimension in the maritime context	Human security dimension description in the maritime context
Freedom from fear	Maritime security concerns	The conflict led to concerns about crew safety on board ships in the Black Sea and Sea of Azov. Military operations, and potential shipping route limitations fostered a climate of fear and uncertainty among seafarers
Freedom to enjoy human rights	Protection of human rights	Conflict can result in violations of the human rights of seafarers. The well-being and safety of seafarers depends on upholding of their human rights regardless
Freedom to access opportunities	Access to maritime opportunities	Conflict hinders maritime access opportunities, particularly access to shore-based training facilities and timely renewal of competency certificates
Freedom from hazardous conditions	Environmental and physical hazards	During a geopolitical conflict, environmental hazards may result from destruction or damage of ships, including oil leaks, and pollution; these dangers threaten both maritime security and ocean health. Physically, the stress from conflict can cause various health problems

Table A2. Social readjustment dimension attributes

Holmes & Rahe stress scale			Description of critical life event in the context of the geopolitical conflict in Ukraine
Rank	Value	Critical life event	
11	44	Change in health of family members	Stress and anxiety can stem from concerns about family member health and safety, particularly if they are directly impacted by the conflict.
22	29	Change in responsibilities at work	Conflicts can impose extra duties on seafarers, like looking after kin who have been uprooted or resolving confusing difficulties. The weight of extra responsibilities can be oppressive and cause for worry
28	25	Change in living conditions	Significant changes in living conditions, including displacement and destruction of homes, may be experienced by seafarers and families affected by the conflict. Changes can cause stress and instability
29	24	Change in personal habits	Through the conflict, personal routines and habits could change, leading to issues like insomnia, shifts in eating habits, and self-care struggles
31	20	Change in work hours or conditions	Disruptions caused by conflicts may affect employment and economic stability, resulting in job loss, decreased earnings, and worries about financial security. Work conditions changes can lead to stress
32	20	Change in routine	Conflict can impinge upon daily activities, making it tough for people to maintain a feeling of routine. Not having a regular routine can lead to feelings of disorientation and stress
33	20	Change in residence	Adapting to new living environments can result in stress, especially when uncertainty and insecurity are present
34	19	Change in recreation	Through conflict, opportunities for recreation and leisure activities can be limited, resulting in feelings of tiredness and annoyance
36	18	Change in social conditions (activities)	Social networks and community life are disrupted by conflict. Isolation and loss can occur when people are separated from their support systems

Table A3. Maritime labour dimension attributes

1	A safe and secure workplace that complies with safety standards
2	Fair terms of employment
3	Decent working and living conditions on board ship
4	Health protection, medical care, welfare measures and other forms of social protection

APPENDIX B: SELECT INTERVIEW EXCERPTS

Freedom from fear

Survey participant (#13104488): *"I was in Chornomorsk port during the war, and I felt safety was not on high level."*

Interview participant (# 9) recalled first day of the conflict: *"I will never forget this day, the sound of the siren shook us, we did not know where to go, everyone panicked, on February 24, the bombs fell on our ship three times, the bridge was burned with all the documents, but no one was injured severely, the seafarers escaped death."*

Interview participant (# 13), Port of Kherson: *"When I was outside on deck, our vessel was hit by bombs, but fortunately, I did not get injured. However, a Ukrainian vessel anchoring next to our vessel suffered a tragedy; one Ukrainian seafarer got injured with a shrapnel wound on his leg."*

Freedom to enjoy human rights

Lack of sleep

Interview participant (# 21), Port of Kherson: *"I was constantly worrying, because my family would see news in the TV and call me, I would lie to them that I was in good condition, but in reality, I was trying to sleep amid bombing."*

Survey participant (#12641236), Engine Department Officer: *"There were shootings, and of course, it was stressful. As for sleep, we slept for 2 or 3 hours. As far as work was concerned, I could not work because there were shootings and the port was bombarded step by step."*

Interview participant (# 21), Deck Department Officer, Port of Berdyansk: *"We were so worried, we could not sleep, maybe 3-4 hours a day; sirens would wake us up. Personally, I was fine with 4 hours sleep at the beginning, but later, I was getting very tired from lack of sleep."*

Experience of Anxiety

Interview participant (# 19), Engine Department Officer, Port of Berdyansk: *"I do not even know the name for my state of mental health, but I think it was depression. I never wanted to talk to anybody; when my family was calling, I did not want to talk to them. I had nothing nice to tell them, there were people dying in front of me, getting injured and I was just lucky not to die, I was always thinking about them; one more step and I could have been in their place."*

Mental health at risk

Interview participant (# 47), Crewing agency: *"We had employed a number of Ukrainians on several ships under our management, and we encountered a problem when*

some of them were not willing to work saying that they are stressed and not able to perform their duties. ... it is not acceptable on board a vessel as it can cause dangerous atmosphere on board. Of course, we gave them some time to adopt to the situation, but nothing changed, and we had to discharge them. But of course, we have lots of successful contracts where everybody performs their duties well, and everything is ok."

Freedom to Access Opportunities

Access to shore-based training facilities

Survey participant (#13104671), Ukrainian seafarer: *"It is impossible to renew the certificates or any other maritime documents in Ukraine, and so I did my training in Poland."*

Interview participant (#38), Crewing agency in Georgia: *"We provide trainings for foreign citizens in house, in particular for Russians and Ukrainians, before embarkation, and debriefing as well."*

Survey participant (#12856729), Ukrainian seafarer: *"There was a delay in renewal of my license. It took me about 9 months to renew my COC endorsement online while the government was struggling to build the online process."*

Freedom from hazardous conditions

Workload profile change

Survey participant (#12615541), Deck Department Officer: *"I was ordered more watch keeping time."*

Interview participant (#14), Port of Mariupol: *"Our dry cargo vessel arrived at the Port of Mariupol on 19 February 2022. Port Operations were proceeding as usual, but as soon as the conflict broke out, all operations were suspended. We had nothing to do, we would stand on the deck and just look around, looking out for danger. Our rest hours were not the same, we could not sleep, everybody was gathering together, our only task was to stay safe and nothing else."*

Interview participant (#8), Engine Department Rating, Port of Izmail: *"We stayed in the port and we didn't move anywhere, and nothing to do, we were hiding, there was no safety practice, our priority was to stay alive."*

Compliance of safety norms

Interview participant (# 6), Port of Reni: *"Drills were conducted as per the standard before the conflict. Post 24 February 2022, only a couple of safety related trainings are conducted, the main purpose being to review the ways to save ourselves if we were to be bombed severely. That's the only trainings I had past year".*