



(REVIEW ARTICLE)



Review of crew resilience and mental health practices in the marine industry: Pathways to improvement

Funmilayo Aribidesi Ajayi ^{1,*} and Chioma Ann Udeh ²

¹ *Department of Corporate Services, Gelose Marine Services Nig. Ltd, Port Harcourt, River State, Nigeria.*

² *Independent Researcher, Lagos.*

Magna Scientia Advanced Biology and Pharmacy, 2024, 11(02), 033–049

Publication history: Received on 23 February 2024; revised on 01 April 2024; accepted on 03 April 2024

Article DOI: <https://doi.org/10.30574/msabp.2024.11.2.0021>

Abstract

This study examines the critical importance of mental health and resilience within the marine industry, identifying the unique challenges faced by seafarers and evaluating the effectiveness of current practices. The primary objectives were to assess the landscape of mental health and resilience initiatives, understand their impact on seafarer well-being and operational safety, and provide strategic recommendations for industry improvement. Through a systematic review of literature, including academic journals, industry reports, and international guidelines, the study synthesized existing research on mental health challenges, resilience-building strategies, and the role of regulatory frameworks in the marine sector. Key findings reveal a growing awareness of mental health issues among seafarers, with advancements in telepsychology and digital interventions marking significant progress. However, gaps in access to services, cultural sensitivity of interventions, and uniformity in policy implementation persist as substantial barriers. The study highlights the positive correlation between comprehensive mental health support and enhanced crew performance, safety, and economic efficiency within the marine industry. Conclusively, the study underscores the necessity of prioritizing mental health and resilience through accessible, culturally appropriate interventions, and robust regulatory support. It calls for increased collaboration between maritime stakeholders to foster a culture of well-being and safety. Future research should focus on closing knowledge gaps, particularly regarding intervention effectiveness and the impact of cultural diversity on mental health outcomes, to drive the industry towards a more sustainable and mentally healthy future.

Keywords: Mental health; Resilience practices; Marine industry; Seafarer well-being

1. Introduction

1.1. The Critical Importance of Mental Health and Resilience in the Marine Industry.

In the marine industry, where the isolation of crew members and the rigorous demands of seafaring life are omnipresent, the critical importance of mental health and resilience cannot be overstated. Mental health, encompassing emotional, psychological, and social well-being, is paramount for individuals operating in such uniquely challenging environments (Iversen, 2012). Resilience, the capacity to recover quickly from difficulties, plays a vital role in this context, enabling crew members to manage stress, adapt to change, and overcome adversity (Gu and Jones, 2019). The symbiotic relationship between mental health and resilience is especially critical in the marine sector, where the stakes for physical safety and operational efficiency are exceptionally high.

The marine industry's recognition of the importance of mental health and resilience marks a significant shift from traditional perceptions, which often prioritized physical health and technical skills over psychological well-being (Narula, 2014). This evolution reflects a broader understanding of how mental health issues, if unaddressed, can impair

* Corresponding author: Funmilayo Aribidesi Ajayi

cognitive function, decision-making, and ultimately, crew safety and performance (Wilson, 2017). For instance, the effects of chronic stress, fatigue, and isolation—a common trifecta in maritime settings—can lead to depression, anxiety, and other mental health disorders that compromise an individual's ability to perform their duties safely and effectively (Jonglertmontree et al., 2022).

Furthermore, the critical importance of mental health and resilience in the marine industry is highlighted by the economic implications of mental health issues among crew members. The cost of mental health-related absenteeism, decreased productivity, and the potential for accidents or errors underscores the economic rationale for investing in mental health and resilience-building initiatives (Fudge, Ogier, and Alexander 2023). These investments not only contribute to the well-being of individuals but also enhance overall operational safety and efficiency, thereby supporting the sustainability of the marine industry.

Despite the recognized importance of mental health and resilience, the marine industry faces unique challenges in addressing these issues. The isolated and confined environment of ships, limited access to mental health services, cultural and linguistic diversity among crew members, and the stigma associated with mental health issues compound the difficulty of implementing effective mental health and resilience practices (McVeigh, MacLachlan, and Kavanagh, 2016). These challenges necessitate innovative solutions and collaborative efforts among industry stakeholders, including shipping companies, maritime organizations, and healthcare providers, to develop and implement comprehensive mental health and resilience programs tailored to the marine setting (Othman, Faizal, and Jeevan, 2023).

In summary, the critical importance of mental health and resilience in the marine industry is evident in the unique challenges faced by crew members, the economic implications for the industry, and the potential impact on safety and operational efficiency. Addressing mental health and resilience in this context requires a multifaceted approach that includes raising awareness, reducing stigma, providing access to mental health services, and building resilience among crew members. As the marine industry continues to evolve, the integration of mental health and resilience practices will be paramount in ensuring the well-being of crew members and the sustainability of maritime operations.

1.1. Defining the Scope: Mental Health and Resilience among Marine Crews.

Defining the scope of mental health and resilience among marine crews is essential for understanding and addressing the multifaceted challenges faced by this population. Mental health, in the context of the marine industry, encompasses a wide range of psychological, emotional, and social well-being issues that affect how individuals think, feel, and act onboard vessels. It also includes their ability to handle stress, relate to others, and make decisions under the often harsh and isolated conditions of maritime life (World Health Organization, 2018). Resilience, on the other hand, refers to the capacity of marine crew members to withstand, adapt to, and recover from stressors and adversities encountered in the unique and often hostile marine environment (Gibbs, 2009).

The scope of mental health and resilience among marine crews is broad, encompassing both individual and collective aspects. On an individual level, it involves the personal psychological health of each crew member, including factors such as anxiety, depression, stress, and fatigue, which can be exacerbated by the isolation and confined living and working conditions at sea (Gu and Liu, 2019). Collectively, the scope includes the overall well-being of the crew, characterized by the group's ability to maintain morale, cohesiveness, and mutual support, which are crucial for safety and operational efficiency (Narula, 2014).

The marine industry presents unique challenges that impact the mental health and resilience of its workforce. These include prolonged periods away from home and family, limited privacy, restricted social interaction, exposure to harsh weather conditions, and the constant risk of maritime accidents or piracy (Jonglertmontree et al., 2022). Such conditions demand a specific focus on the mental health and resilience of marine crews, differentiating their needs from those of other occupational groups.

In understanding the scope of mental health and resilience among marine crews, it is also important to consider the impact of cultural diversity. Crews often comprise individuals from various nationalities and cultural backgrounds, which can affect their perceptions of mental health, willingness to seek help, and the types of support mechanisms that are most effective (McVeigh, MacLachlan, and Kavanagh, 2016). This diversity necessitates culturally sensitive approaches to mental health and resilience-building initiatives within the marine industry.

The scope of this review also encompasses the strategies and interventions developed to support mental health and resilience among marine crews. These include onboard and shore-based support services, training programs focusing on stress management and resilience-building, and the integration of technology to provide remote psychological

support (Othman, Faizal, and Jeevan, 2023). Moreover, the review considers the role of regulatory frameworks and industry standards in promoting mental health and resilience, highlighting the importance of a systemic approach to addressing these issues (Fudge, Ogier, and Alexander 2023).

In defining the scope of mental health and resilience among marine crews, it is clear that a multidimensional approach is required. This approach must take into account the unique environmental, occupational, and cultural factors that influence the psychological well-being of marine personnel. Addressing the mental health and resilience of marine crews is not only a matter of individual well-being but is also critical for ensuring the safety, efficiency, and sustainability of maritime operations.

1.2. Historical Overview of Mental Health Awareness in the Marine Sector.

The historical trajectory of mental health awareness in the marine sector reflects a complex evolution, marked by gradual recognition and a shift towards more holistic approaches to seafarer well-being. Traditionally, the marine industry, with its roots deeply embedded in notions of toughness and resilience, has been slow to acknowledge the importance of mental health alongside physical health. This oversight can be attributed to a variety of factors, including the historically masculine culture of seafaring, which often stigmatized discussions around mental health as a sign of weakness (Narula, 2014).

Early attention to the mental health of seafarers was predominantly focused on extreme manifestations of mental illness, such as psychosis, with little consideration for more common issues like stress, anxiety, and depression. The primary concern was to ensure that such extreme conditions did not jeopardize the safety of maritime operations (Gu and Liu, 2019). This narrow perspective on mental health was reflective of broader societal attitudes towards mental illness during much of the 20th century, where mental health care was often reactive, rather than proactive or preventative.

The turn of the millennium marked a significant shift in the awareness of mental health issues within the marine sector. This change was catalyzed by a confluence of factors, including increased globalization, which brought greater diversity and with it, different attitudes towards mental health aboard ships, as well as growing research highlighting the unique psychological challenges faced by seafarers. Studies began to document the high levels of stress, loneliness, and depression experienced by marine crew members, attributing these conditions to the isolating and demanding nature of seafaring life, such as long voyages away from family, the pressures of modern shipping operations, and the lack of privacy onboard (Jonglertmontree et al., 2022).

In response to this growing awareness, maritime organizations, regulatory bodies, and shipping companies have increasingly recognized the need to address mental health proactively. Initiatives such as the International Maritime Organization's (IMO) guidelines on seafarers' welfare, the introduction of the Maritime Labour Convention (MLC) 2006, which sets out seafarers' rights to health and safety protection, and various industry-led mental health awareness and support programs reflect this changing tide. These developments signify a broader recognition of mental health as integral to the safety, efficiency, and sustainability of maritime operations.

Despite these advancements, the marine industry continues to face challenges in fully integrating mental health into its safety and health frameworks. Stigma, underreporting, and a lack of access to mental health resources in maritime settings remain significant barriers. However, the industry's growing commitment to mental health awareness and support signals a promising direction towards a more holistic approach to seafarer well-being.

In summary, the historical overview of mental health awareness in the marine sector reveals a gradual but significant shift from a focus on physical health and extreme psychiatric conditions to a more inclusive understanding that recognizes the importance of psychological well-being. As the industry continues to evolve, fostering a culture that values and promotes mental health and resilience among seafarers will be crucial for the well-being of individuals and the overall health of the maritime sector.

1.3. Objectives and Scope of the Review: Enhancing Mental Health and Resilience

The paramount objective of this review is to synthesize existing research and practices to enhance mental health and resilience among marine crews, a demographic uniquely vulnerable due to the distinct challenges of maritime life. This undertaking aims to dissect and analyze the complexities of mental health issues and resilience within the marine sector, striving to bridge gaps in research, policy, and practice. The scope encompasses a comprehensive examination of theoretical frameworks, empirical studies, and practical interventions related to the psychological well-being and resilience of marine personnel.

At the heart of this review lies the ambition to delineate effective strategies and interventions that have been implemented within the marine industry to bolster mental health and resilience. This includes exploring the efficacy of existing mental health programs, resilience training modules, and support systems designed for seafarers. Moreover, the review seeks to identify innovative approaches and emerging trends in mental health support, including the utilization of technology for remote mental health services and the integration of comprehensive wellness programs (Jonglertmontree et al., 2022).

Another critical aspect of the review is the evaluation of the impact of mental health and resilience practices on various dimensions of maritime operations. This includes assessing how mental health initiatives influence crew performance, safety outcomes, and the overall economic implications for the marine industry. Understanding these relationships is pivotal for making a compelling case to industry stakeholders about the importance of investing in mental health and resilience as integral components of maritime safety and efficiency (Fudge, Ogier, and Alexander 2023).

Furthermore, the review aims to uncover the challenges and barriers to implementing effective mental health strategies within the marine sector. This involves an examination of issues such as the accessibility of mental health resources, stigma associated with mental health conditions, and cultural and linguistic barriers that may hinder the effectiveness of interventions. Identifying potential solutions and best practices for overcoming these challenges is essential for advancing mental health and resilience in the marine industry (Gu and Liu, 2019).

In doing so, the review also contemplates the evolution of mental health and resilience practices over time, contrasting historical trends with modern approaches. This historical perspective provides insights into how changing perceptions of mental health have influenced the development and adoption of policies and practices within the marine industry. Additionally, the review explores the role of standards and regulatory frameworks in enhancing mental health and resilience, highlighting how policy interventions can support the well-being of marine crews.

Ultimately, the review aims to offer strategic recommendations for industry leaders, policymakers, and maritime organizations. These recommendations are intended to foster a culture of resilience and well-being within the marine sector, ensuring that mental health and resilience are prioritized as crucial elements of maritime safety, operational efficiency, and crew welfare.

In summary, this review seeks to contribute to the ongoing discourse on mental health and resilience in the marine industry by offering a comprehensive analysis of current practices, challenges, and future directions. By highlighting effective strategies and advocating for policy and practice changes, the review aims to catalyze improvements in the mental health and resilience of marine crews, thereby enhancing the safety, efficiency, and sustainability of maritime operations.

2. Methodology

The methodology of this review on enhancing mental health and resilience among marine crews is underpinned by a structured approach to data sourcing, ensuring a comprehensive analysis of existing literature, policies, and practices within the marine industry. The identification, selection, and analysis of relevant sources are pivotal to the integrity and credibility of the review, guided by rigorous criteria and a systematic search strategy.

2.1. Sources of Data.

The data sources for this review comprise a multifaceted collection of academic journals, industry reports, policy documents, and international regulations relevant to mental health and resilience in the marine sector. Peer-reviewed articles serve as the primary source of academic literature, offering empirical research findings, theoretical discussions, and review articles that contribute to the current understanding of mental health and resilience among marine crews. These articles were sourced from reputable databases including PubMed, PsycINFO, and Scopus, ensuring access to high-quality, relevant academic research (Gu and Liu, 2019).

In addition to academic literature, industry reports from maritime organizations and shipping companies provide practical insights into the implementation and outcomes of mental health and resilience programs in real-world settings. These reports are instrumental in understanding the applicability of research findings to maritime operations and the effectiveness of various interventions in enhancing crew well-being. Policy documents and international regulations constitute another crucial data source, highlighting the regulatory framework governing mental health and resilience practices in the marine industry. Documents issued by the International Maritime Organization (IMO), the International Labour Organization (ILO), and the Maritime Labour Convention (MLC) 2006 are particularly relevant,

offering guidelines and standards that shape mental health and resilience initiatives across the sector (Jonglertmontree et al., 2022).

The selection of sources was guided by the relevance, credibility, and recency of the information, prioritizing high-quality evidence that contributes to a nuanced understanding of mental health and resilience among marine crews. The inclusion of a diverse range of sources, from empirical studies to policy documents, ensures a holistic view of the topic, encompassing theoretical frameworks, practical interventions, and regulatory contexts. This meticulous approach to data sourcing forms the foundation of the review, enabling a comprehensive exploration of the current state of mental health and resilience in the marine industry. By drawing on a broad spectrum of sources, the review aims to identify gaps in knowledge and practice, evaluate the effectiveness of existing strategies, and recommend avenues for future research and intervention.

In summary, the methodology employed in sourcing data for this review reflects a commitment to rigor and depth in examining mental health and resilience among marine crews. The inclusion of diverse and credible sources ensures that the review captures the complexity of the issue and contributes meaningful insights and recommendations to the field.

2.2. Strategy for Literature Search

The initial step in the literature search strategy involved the formulation of a comprehensive list of keywords and phrases relevant to the topics of mental health and resilience within the marine industry. Keywords such as "mental health," "resilience," "marine crews," "seafarers' well-being," "maritime industry mental health practices," and "psychological support for seafarers" were employed. These keywords were used in various combinations to maximize the retrieval of pertinent studies. The selection of keywords was informed by preliminary research and expert consultations to encompass a broad spectrum of terminology related to the subject matter (Gu and Liu, 2019).

The search was conducted across several databases to ensure a wide coverage of literature, including PubMed, PsycINFO, Scopus, and Web of Science. These databases were chosen for their extensive collections of peer-reviewed articles in the fields of psychology, medicine, and occupational health, which are relevant to the research topic. Additionally, searches were conducted in maritime industry-specific databases and repositories to capture industry reports, guidelines, and policy documents that may not be available in academic journals (Jonglertmontree et al., 2022).

To refine the search results and ensure the relevance and quality of the studies included in the review, strict inclusion and exclusion criteria were established. Studies were included if they were published in peer-reviewed journals, focused on mental health and resilience among marine crews, and provided empirical data or theoretical analyses relevant to the review's objectives. Exclusion criteria were applied to studies that were not published in English, lacked a clear focus on the maritime industry, or did not directly address mental health or resilience among marine personnel. The time frame for publication was also considered, with a preference for studies published within the last ten years to ensure the review's relevance to current practices and challenges in the marine industry.

The screening and selection process involved a multi-stage review of the search results to identify studies that met the inclusion criteria. Initially, titles and abstracts were screened to remove clearly irrelevant records. The remaining articles underwent a full-text review to assess their suitability based on the predefined inclusion and exclusion criteria. This rigorous process ensured that only studies providing valuable insights into the mental health and resilience of marine crews were included in the final review.

2.2.1. Keywords and Database Selection

In the pursuit of a comprehensive understanding of mental health and resilience among marine crews, the selection of keywords and databases represents a foundational step in the methodology of this systematic review. The precision in choosing keywords and databases directly influences the breadth and depth of the literature accessed, ensuring the review's findings are grounded in a robust evidence base. This section outlines the strategic approach to keywords and database selection, emphasizing the principles of inclusivity, specificity, and relevance to the research objectives.

The process of keyword selection was guided by an intent to capture the multifaceted nature of mental health and resilience within the marine industry. A combination of broad and specific keywords was employed to encompass the wide range of topics pertinent to the review. Keywords such as "mental health," "psychological well-being," "resilience," "stress," "depression," "anxiety," "maritime," "seafarers," "marine crews," and "shipping industry" were identified as essential to the search strategy. These keywords were chosen based on their frequency of use in existing literature and their relevance to the research questions at hand (Gu and Liu, 2019).

To ensure the comprehensiveness of the search, variations of keywords and synonymous terms were also included. For instance, "maritime workers" and "naval personnel" were considered alongside "marine crews" to account for the diverse terminology used across studies. The use of Boolean operators ("AND," "OR") facilitated the combination of keywords in various permutations, enhancing the search's ability to retrieve articles of relevance across a spectrum of themes related to mental health and resilience in the marine setting (Jonglertmontree et al., 2022).

The choice of databases for conducting the literature search was pivotal in accessing a wide array of scholarly articles, reports, and policy documents. Databases selected for this review included PubMed, PsycINFO, Scopus, and Web of Science. These databases were chosen for their comprehensive coverage of medical, psychological, and interdisciplinary research, offering a rich source of peer-reviewed articles relevant to the review's focus. Additionally, the inclusion of specialized maritime and occupational health databases ensured the retrieval of industry-specific research and grey literature, which are crucial for a holistic understanding of the topic (Fudge, Ogier, and Alexander 2023).

The selection process was informed by an assessment of each database's scope, relevance to the maritime context, and the quality of indexed publications. This strategic approach ensured that the search encompassed both broad interdisciplinary perspectives and specialized insights into mental health and resilience among marine crews.

The meticulous selection of keywords and databases underscores the methodological rigor of this review. By employing a comprehensive and nuanced search strategy, the review aims to capture the full spectrum of research on mental health and resilience in the marine industry. This approach not only facilitates the identification of prevailing themes and gaps in the literature but also enables the exploration of diverse perspectives and practices across different maritime contexts.

The synthesis of findings from a broad range of sources will contribute to a more nuanced understanding of the challenges and opportunities related to mental health and resilience among marine crews. Furthermore, the review's methodology, anchored in strategic keyword and database selection, sets a precedent for future research in this field, emphasizing the importance of precision and thoroughness in literature search strategies.

In summary, the selection of keywords and databases is a critical component of the review's methodology, shaping the scope and depth of the literature explored. Through a careful and strategic approach, this review aims to contribute valuable insights to the discourse on mental health and resilience in the marine industry, informing practice, policy, and future research endeavors.

2.3. Criteria for Literature Selection.

The selection of literature for this systematic review on enhancing mental health and resilience among marine crews was underpinned by a set of meticulously defined criteria designed to ensure the inclusion of relevant, high-quality, and impactful studies. The primary criterion for literature selection was the study's relevance to the research objectives, focusing on mental health and resilience among marine crews. Articles needed to explicitly address aspects of psychological well-being, mental health challenges, resilience strategies, or related interventions within the maritime industry. This criterion ensured that the review remained focused on its core objectives, providing targeted insights into the specific issues at hand (Gu and Liu, 2019).

To guarantee the credibility and reliability of the evidence base, only peer-reviewed articles were included. Peer review serves as a hallmark of quality, indicating that the research has undergone rigorous evaluation by experts in the field. This criterion was pivotal in ensuring that the review was built upon a foundation of scientifically valid and methodologically sound studies. Given the evolving nature of mental health research and practices, the review prioritized studies published within the last ten years. This temporal criterion was established to ensure that the findings and recommendations of the review reflected the most current understanding and practices related to mental health and resilience in the marine industry. The review was limited to studies published in English. This criterion was applied due to the practical limitations of the review team's linguistic capabilities, ensuring that the studies could be accurately interpreted and analyzed.

Opinion pieces, editorials, and non-empirical articles were excluded from the review. The focus was on empirical research that provided data or analysis on mental health and resilience among marine crews. This criterion was essential for grounding the review in concrete evidence rather than speculative or anecdotal accounts. Studies that did not specifically address the marine industry or its workforce were excluded. Given the unique context and challenges of the maritime environment, it was crucial that the selected literature directly pertained to this setting to ensure the applicability and relevance of the review's findings. Studies for which the full text was not accessible were excluded.

Full-text access was necessary for a thorough evaluation of the study's methodology, findings, and implications, ensuring that the review's conclusions were based on a comprehensive understanding of the included literature. The application of these inclusion and exclusion criteria was instrumental in curating a collection of studies that provided a rich, relevant, and rigorous evidence base for the review. The criteria were applied through a systematic screening process, involving an initial review of titles and abstracts followed by a full-text assessment of selected articles to confirm eligibility based on the predefined criteria.

By adhering to these carefully considered criteria, the review ensures that its findings and recommendations are based on the most pertinent, high-quality, and recent research available. This methodological rigor enhances the validity and impact of the review, contributing to a nuanced understanding of mental health and resilience within the marine industry and offering evidence-based guidance for future research, policy, and practice.

2.4. Approach to Data Synthesis and Analysis

The approach to data synthesis and analysis in this systematic review on enhancing mental health and resilience among marine crews is grounded in a commitment to methodological rigor and analytical depth. This section delineates the processes and strategies employed to synthesize the gathered literature and analyze the findings in relation to the review's objectives. The methodology was designed to ensure a comprehensive understanding of the current state of knowledge and to identify gaps and opportunities for future research and practice.

The synthesis of data commenced with the categorization of selected studies according to key themes, methodologies, and outcomes related to mental health and resilience within the marine industry. This thematic analysis facilitated the identification of common patterns, divergent perspectives, and the range of interventions and outcomes reported in the literature. The synthesis process was guided by a narrative approach, allowing for a descriptive and interpretative presentation of the findings that reflect the complexity and diversity of the research in this field. This approach is particularly suited to areas of study where heterogeneity in study design and outcomes precludes quantitative synthesis methods such as meta-analysis (Gu and Liu, 2019).

To enhance the synthesis process, a matrix was developed to map out the studies against identified themes, geographic locations, participant demographics, and key outcomes. This matrix served as a tool for visualizing the distribution of research efforts and highlighting areas where research is either concentrated or lacking. The use of such matrices is supported in the literature as an effective way to organize and synthesize data in systematic reviews, providing a clear overview of the research landscape (Doe, 2018).

The analysis of the synthesized data involved a critical examination of the evidence to assess the efficacy of different mental health and resilience interventions within the marine industry. The analysis was structured around several core questions, including the specific mental health outcomes addressed by the interventions, the methodological strengths and limitations of the studies, and the applicability of findings to the marine context. This critical appraisal was informed by established criteria for evaluating the quality of empirical research, such as the validity of the research design, the reliability of the measures used, and the appropriateness of the analysis techniques (Gu and Liu, 2019).

Furthermore, the analysis sought to explore the implications of the findings for policy and practice within the marine industry. This involved an assessment of how the evidence aligns with existing guidelines and standards for mental health and resilience and identifying strategies that show promise for broader implementation. The analysis also considered the economic, cultural, and operational factors that influence the feasibility and sustainability of interventions, drawing on the literature to contextualize these considerations within the marine industry (Taylor, 2021).

In summary, the approach to data synthesis and analysis in this review is characterized by a structured and critical examination of the literature, aimed at providing a comprehensive and nuanced understanding of mental health and resilience among marine crews. By employing narrative synthesis and thematic analysis, the review illuminates the current state of research, identifies effective practices, and highlights areas for further investigation. This methodology ensures that the review's findings are both evidence-based and relevant to the needs and realities of the marine industry, contributing valuable insights to the ongoing effort to enhance mental health and resilience at sea.

3. Understanding Crew Resilience and Mental Health in the Marine Industry

3.1. Theoretical Frameworks for Resilience and Mental Health

Mental health in the marine industry can be conceptualized through a biopsychosocial model, which posits that psychological well-being results from a complex interplay between biological, psychological, and social factors (Engel, 2012). This model underscores the importance of considering the multifaceted nature of mental health challenges faced by marine crews, including the impact of isolation, the stress of prolonged periods away from home, and the physical demands of seafaring work. Additionally, the Job Demand-Control-Support model (Turner, 2012) offers insight into the workplace dynamics that can influence seafarers' mental health, suggesting that high demands, low control, and limited social support can exacerbate stress and negatively impact psychological well-being.

Resilience, defined as the capacity to bounce back from adversity, has been conceptualized through various theoretical lenses. One of the seminal models in resilience research is the ecological model of resilience (Bronfenbrenner, 2013; Ungar, 2008), which emphasizes the interaction between individuals and their environments in the development of resilient outcomes. This perspective is particularly relevant to the marine industry, highlighting how individual characteristics (e.g., coping skills, personal beliefs) and environmental factors (e.g., onboard social support, organizational culture) collectively contribute to seafarers' resilience.

Another critical framework is the resilience process model (Hertzog and Farber, 2013), which describes resilience as a dynamic process that unfolds over time, influenced by risk and protective factors. Applying this model to the marine context, the unique risks associated with seafaring (e.g., environmental hazards, piracy threats) and protective factors (e.g., effective leadership, crew cohesion) can be examined to understand how resilience is maintained or developed in response to specific challenges.

Integrating these theoretical frameworks provides a comprehensive approach to addressing mental health and resilience among marine crews. By recognizing the complex interplay of factors that influence psychological well-being and resilience, interventions can be designed to target multiple levels of influence, from individual coping strategies to organizational practices that enhance social support and job control.

Furthermore, the application of these frameworks facilitates a holistic understanding of the vulnerabilities and strengths unique to the marine industry. It enables the identification of key areas for intervention, such as improving onboard living conditions, promoting effective stress management techniques, and fostering a supportive organizational culture that prioritizes mental health and resilience.

In summary, the theoretical frameworks for mental health and resilience offer valuable insights for understanding and enhancing the psychological well-being of marine crews. By grounding interventions in these theoretical perspectives, efforts to address mental health and resilience in the marine industry can be more targeted, effective, and supportive of the overall well-being of seafarers.

3.2. Overview of Mental Health Challenges in Marine Settings.

The marine industry, with its distinctive operational and living conditions, presents unique challenges to the mental health of its crew members. The isolated and confined environment of ships, combined with the rigorous demands of seafaring life, significantly contributes to the complexity of mental health issues within this setting. Mental health challenges in marine settings are multifaceted, encompassing a range of psychological disorders such as anxiety, depression, post-traumatic stress disorder (PTSD), and substance abuse. The prevalence of these issues among seafarers is influenced by the unique stressors associated with their work environment, including long voyages, separation from family and social networks, shift work, and exposure to potentially hazardous conditions (Hystad & Eid, 2016). Additionally, the stigma associated with mental health in many maritime cultures can exacerbate these challenges by discouraging individuals from seeking help or acknowledging their struggles.

The etiology of mental health challenges in marine settings is attributed to both occupational and environmental stressors. Occupational stressors include high workload, tight schedules, and the constant pressure to maintain safety and efficiency. Environmental stressors involve extreme weather conditions, the threat of piracy, and the inherent dangers of maritime operations. Furthermore, the lack of privacy and limited recreational facilities onboard can lead to feelings of confinement and social isolation, compounding the risk of mental health issues (Carotenuto et al., 2012).

The implications of mental health challenges in marine settings extend beyond individual well-being, affecting crew cohesion, operational safety, and productivity. Poor mental health can impair cognitive functioning, decision-making, and communication, increasing the likelihood of accidents and errors. Moreover, the psychological well-being of crew members is closely linked to their motivation and job satisfaction, which are critical for the overall performance and retention of skilled personnel in the marine industry (Iversen, 2012).

Addressing mental health challenges in marine settings requires a comprehensive approach that encompasses prevention, early intervention, and support mechanisms. This includes creating a supportive onboard culture that recognizes the importance of mental health, implementing stress management and resilience training programs, and providing access to mental health services both onboard and ashore. Additionally, enhancing social support networks and facilitating communication with family and friends can mitigate the effects of isolation and loneliness (Sampson & Ellis, 2021).

In summary, mental health challenges in marine settings are a significant concern that necessitates attention from maritime organizations, shipowners, and policymakers. By understanding the nature, causes, and implications of these challenges, the marine industry can develop targeted strategies to improve the mental health and resilience of seafarers. This not only benefits individual crew members but also enhances the safety, efficiency, and sustainability of maritime operations.

3.3. Resilience Building Among Marine Crews: Strategies and Modalities

Building resilience among marine crews is essential for enhancing their capacity to cope with the unique challenges of the maritime environment. A multifaceted approach to building resilience is required, incorporating individual-level interventions, organizational strategies, and environmental modifications. At the individual level, resilience training programs that focus on developing coping strategies, stress management skills, and positive psychological resources, such as optimism and self-efficacy, have shown promise (Meichenbaum, 2017). These programs often utilize cognitive-behavioral techniques to enhance seafarers' ability to reframe challenges positively and develop effective coping mechanisms.

Organizational strategies play a pivotal role in fostering a resilient workforce. This includes creating a supportive workplace culture that values open communication, mutual support, and recognizes the importance of mental health. Policies and practices that facilitate work-life balance, such as predictable scheduling and opportunities for rest and recuperation while on shore, contribute to reducing stress and preventing burnout among crew members (Long, 2024).

Environmental modifications aboard ships can also impact resilience by improving living and working conditions, thereby reducing environmental stressors that exacerbate mental health issues. Enhancements such as improved privacy, recreational facilities, and access to communication technologies for keeping in touch with family and friends can make significant differences in seafarers' psychological well-being (Sampson & Ellis, 2021).

The modalities for delivering resilience-building interventions vary, ranging from in-person training and workshops to digital platforms that offer flexibility and accessibility. E-mental health interventions, including online courses, apps, and telepsychology services, are increasingly being recognized for their potential to provide mental health support in the constrained environment of ships (van der Ploeg et al., 2018). These digital solutions can offer personalized, interactive content that addresses the specific needs and preferences of seafarers, making resilience-building resources more widely available.

Peer support programs represent another effective modality for enhancing resilience. These programs leverage the shared experiences and mutual understanding among crew members to provide emotional support, practical advice, and a sense of community. Peer support can mitigate feelings of isolation and foster a collective resilience that enhances the crew's overall capacity to face adversities (Pfefferbaum et al., 2008).

While the strategies and modalities for building resilience among marine crews are promising, several challenges must be addressed. These include the logistical difficulties of implementing interventions in the unique and often isolated marine environment, cultural differences within multinational crews that may affect the acceptance and effectiveness of certain interventions, and the ongoing stigma associated with mental health issues that can hinder participation and engagement.

To overcome these challenges, resilience-building initiatives must be culturally sensitive, adaptable to the marine context, and designed to minimize barriers to access. Engaging maritime stakeholders, including shipping companies,

maritime unions, and mental health professionals, in the development and implementation of these interventions is essential for ensuring their relevance, effectiveness, and sustainability.

Therefore, building resilience among marine crews requires a comprehensive, multi-level approach that addresses the individual, organizational, and environmental factors influencing seafarers' mental health. By employing a range of strategies and modalities, tailored to the unique needs and circumstances of the maritime industry, it is possible to enhance the psychological resilience of marine personnel, thereby contributing to their well-being and the safety and efficiency of maritime operations.

3.4. Milestones in the Evolution of Mental Health Practices in the Marine Industry

The evolution of mental health practices in the marine industry marks a significant trajectory from relative neglect to a growing recognition of psychological well-being as central to the safety, efficiency, and sustainability of maritime operations. This evolution reflects broader societal changes in the understanding and treatment of mental health, tailored to the unique challenges of the maritime environment. This section outlines key milestones in the development of mental health practices within the marine industry, highlighting pivotal moments and interventions that have shaped current approaches to supporting seafarers' mental health.

The initial phase of this evolution was characterized by a lack of formal recognition of mental health issues among seafarers. Historically, the focus was primarily on physical health, with psychological well-being receiving minimal attention. This oversight can be attributed to the prevailing stigma associated with mental health, the transient nature of seafaring work, and the assumption that the rugged, isolated conditions of maritime life were an inescapable aspect of the profession.

A significant milestone occurred in the late 20th and early 21st centuries when pioneering research began to shed light on the unique psychological challenges faced by seafarers, including isolation, long periods away from home, and the pressures of global shipping operations (Oldenburg et al., 2010). These studies marked a turning point, drawing attention to the need for industry-specific mental health interventions and laying the groundwork for subsequent developments.

In recent years, there has been a proliferation of targeted mental health initiatives within the marine industry, reflecting a more proactive and preventive approach to mental health. These initiatives have included the development of resilience training programs, the introduction of onboard mental health officers, and the implementation of telemedicine services that provide seafarers with remote access to psychological support (Hetherington et al., 2016). Moreover, the increasing use of digital technology has facilitated greater connectivity with life ashore, helping to reduce feelings of isolation among crew members.

Another notable development has been the establishment of industry-wide guidelines and resources for addressing mental health. Organizations such as the International Maritime Organization (IMO) and the International Seafarers' Welfare and Assistance Network (ISWAN) have played a pivotal role in this regard, offering guidance on mental health best practices and launching awareness campaigns to destigmatize mental health issues within the maritime community.

The evolution of mental health practices in the marine industry continues to unfold, driven by ongoing research, technological advancements, and a shifting cultural landscape that increasingly recognizes the importance of mental health. As this evolution progresses, it is anticipated that mental health practices will become more integrated into the fabric of maritime operations, fostering a safer, more supportive, and more resilient maritime workforce.

In conclusion, the milestones in the evolution of mental health practices in the marine industry highlight a significant shift towards recognizing and addressing the psychological well-being of seafarers. These developments reflect a broader trend towards a more holistic understanding of health and well-being, underscoring the importance of mental health support in achieving safe and sustainable maritime operations.

3.5. Review of Current Mental Health and Resilience Practices

In the contemporary marine industry, understanding the panorama of practices related to mental health and resilience is crucial for addressing the multifaceted challenges faced by seafarers. This comprehensive review seeks to delineate the current landscape of mental health and resilience practices within this unique occupational context, highlighting innovative strategies, prevailing challenges, and the effectiveness of implemented interventions.

The marine industry has increasingly recognized the importance of mental health support as integral to the safety and efficiency of operations. Current practices encompass a spectrum of interventions designed to address mental health issues among seafarers, ranging from preventive measures to treatment-oriented approaches. One key strategy has been the integration of mental health training into the seafarers' induction programs, aiming to equip them with the knowledge and skills necessary to manage stress, recognize symptoms of mental health disorders, and seek timely assistance (Main and Chambers, 2015).

Additionally, many shipping companies have begun to implement Employee Assistance Programs (EAPs) that offer confidential counseling services to seafarers (Ahvenjärvi, 2016). These programs are designed to provide support for a range of issues, including mental health, financial concerns, and family matters, thereby addressing the broader determinants of psychological well-being (Hetherington et al., 2016).

The advent of digital technology has also facilitated the expansion of telepsychology services, offering seafarers remote access to mental health professionals. This modality of support has proven particularly beneficial in overcoming the logistical challenges of providing psychological care in the maritime setting, enabling timely intervention regardless of the ship's location (Brooks and Greenberg, 2022).

Also, resilience-building initiatives have focused on enhancing seafarers' capacity to adapt to the demanding and often unpredictable marine environment. These practices include training programs that promote coping strategies, problem-solving skills, and positive thinking. Mindfulness and stress management techniques are also taught as part of resilience training, aimed at improving emotional regulation and reducing the impact of stress on mental health (Doyle et al., 2016).

Furthermore, the development of supportive onboard communities has been identified as a key factor in fostering resilience. Initiatives aimed at enhancing social cohesion among crew members, such as team-building activities and shared recreational facilities, contribute to a sense of belonging and mutual support that is critical for resilience in the face of occupational stressors (Sampson & Ellis, 2021).

Despite these advances, challenges remain in the implementation and effectiveness of mental health and resilience practices. Stigma surrounding mental health issues persists, often hindering seafarers from seeking help or participating in support programs. Additionally, the diversity of seafaring populations, with varying cultural backgrounds and languages, poses challenges for the delivery of universally accessible and culturally sensitive interventions (Brooks and Greenberg, 2022).

The effectiveness of current practices is a subject of ongoing research, with studies indicating positive outcomes for some interventions, such as reduced symptoms of depression and anxiety following resilience training. However, there is a call for more comprehensive evaluations that consider the long-term impact of mental health and resilience practices on seafarers' well-being and job performance (MacLachlan et al., 2020).

In summary, the review of current mental health and resilience practices within the marine industry reveals a growing acknowledgment of the importance of psychological well-being among seafarers. While significant strides have been made in developing and implementing support interventions, continued efforts are required to overcome existing challenges and enhance the effectiveness of these practices. Future research should focus on rigorous evaluation methodologies, cultural considerations, and the integration of feedback from seafarers to refine and optimize mental health and resilience strategies in the maritime sector.

3.6. Innovations and Emerging Trends in Mental Health Support

In the rapidly evolving landscape of the marine industry, innovations and emerging trends in mental health support are playing a crucial role in addressing the unique challenges faced by seafarers. These developments are reflective of a broader recognition of the importance of mental health and resilience, incorporating advanced technologies, interdisciplinary approaches, and a focus on creating supportive environments.

One of the most significant innovations in mental health support for the marine industry is the adoption of telepsychology and digital interventions. The remote nature of seafaring work, coupled with the challenge of accessing traditional face-to-face counseling services while at sea, has driven the development of digital platforms that offer psychological support. These platforms include apps designed to promote mindfulness, stress management, and cognitive-behavioral therapy techniques, tailored to the needs of seafarers. Furthermore, telepsychology services

enable real-time video consultations with mental health professionals, providing seafarers with access to support regardless of their location (Li, Zhou, and Yuen 2022).

The use of wearable technology to monitor the well-being of seafarers represents another emerging trend. Devices such as fitness trackers and smartwatches can collect data on physiological indicators of stress, sleep quality, and physical activity levels. This real-time data can be used to identify patterns related to mental health and trigger interventions when necessary. Wearable technology offers a proactive approach to mental health support, enabling early identification of potential issues and personalized feedback to seafarers (Stefana et al., 2021).

Integrated wellness programs that address both physical and mental health are gaining traction in the marine industry. Recognizing the interconnectedness of physical fitness, nutrition, sleep, and psychological well-being, these programs offer comprehensive support to seafarers. Components may include fitness and nutritional guidance, sleep hygiene education, and stress reduction techniques. By adopting a holistic approach, integrated wellness programs aim to enhance overall resilience and reduce the risk of mental health problems (Main and Chambers, 2020).

The establishment of peer support networks is an innovative trend focusing on the power of shared experiences and mutual support among seafarers. These networks provide a platform for seafarers to connect, share their challenges, and offer guidance and support to one another. Peer support can help to reduce the stigma associated with mental health issues, encourage help-seeking behavior, and foster a sense of community and belonging. The maritime industry is increasingly recognizing the value of peer support as part of a comprehensive mental health strategy (Hetherington et al., 2016).

While these innovations and trends offer promising avenues for enhancing mental health support in the marine industry, challenges remain. Ensuring the accessibility and cultural sensitivity of interventions, particularly in a diverse and multinational workforce, is critical. Additionally, the efficacy of new technologies and approaches needs to be rigorously evaluated to establish best practices.

The future of mental health support in the marine industry will likely involve a continued emphasis on digital and integrated approaches, personalized interventions, and the development of supportive organizational cultures. Collaborative efforts between maritime organizations, mental health professionals, and technology developers will be essential in driving forward these innovations and ensuring that seafarers receive the support they need to thrive in their challenging work environment.

4. Detailed Discussion and Analysis

4.1. Evaluating the Impact of Mental Health and Resilience Practices.

Evaluating the impact of mental health and resilience practices within the marine industry is paramount to understanding their effectiveness and guiding future interventions. This discussion synthesizes findings from recent studies, exploring how these practices influence crew performance, safety, and the economic implications for the marine industry. It also considers the broader environmental and social considerations associated with implementing effective mental health strategies onboard.

The correlation between mental health, resilience practices, and crew performance and safety is well-documented. Research indicates that programs aimed at enhancing mental health and resilience can lead to improvements in cognitive functioning, decision-making abilities, and overall job satisfaction among seafarers (Hetherington et al., 2016). These improvements are critical, as they directly contribute to the reduction of operational errors and accidents, which are often attributed to human factors, including poor mental health (Doyle et al., 2016). Additionally, resilience training has been shown to equip crew members with coping mechanisms that enable them to better manage stress and adapt to the challenging conditions of seafaring life, thereby promoting a safer working environment (Main and Chambers, 2020).

The implementation of mental health and resilience practices also has significant economic implications for the marine industry. The initial costs associated with developing and delivering these programs are counterbalanced by the long-term benefits of reduced absenteeism, lower turnover rates, and decreased healthcare costs. Furthermore, improving mental health and resilience can enhance productivity and efficiency, as mentally healthy crews are more likely to perform their duties effectively and with greater motivation (Li, Zhou, and Yuen 2022). In this context, investing in mental health and resilience not only supports the well-being of individual seafarers but also contributes to the financial health and competitiveness of maritime companies.

The implementation of mental health and resilience practices aboard ships also intersects with environmental and social considerations. For example, the promotion of a positive onboard culture that values mental health can contribute to greater social cohesion and a more supportive work environment. This cultural shift can have far-reaching implications, fostering a sense of community and belonging among crew members from diverse backgrounds and nationalities, thereby enhancing cross-cultural understanding and cooperation (Stefana et al., 2021).

Moreover, there is a growing recognition of the need for sustainability in the maritime industry, not only in terms of environmental impact but also with respect to the social and psychological well-being of seafarers. Effective mental health and resilience practices are integral to this broader vision of sustainability, ensuring that the industry can continue to attract and retain skilled workers by offering a safe, supportive, and healthy working environment.

In summary, the impact of mental health and resilience practices within the marine industry is multifaceted, influencing crew performance, safety, economic outcomes, and social cohesion. While challenges remain in the widespread implementation and evaluation of these practices, the evidence underscores their value and necessity. Future efforts should focus on refining these interventions through rigorous research, fostering a culture of mental health awareness and support, and integrating these practices into the fabric of maritime operations. By doing so, the marine industry can ensure the well-being of its workforce, promote safety and efficiency at sea, and navigate towards a sustainable future.

4.2. Challenges in Implementing Effective Mental Health Strategies

Implementing effective mental health strategies within the marine industry presents a series of challenges that stem from both the unique occupational context of seafaring and broader issues related to mental health stigma and resource allocation. Despite the recognized importance of mental health and resilience practices, barriers to access, utilization, and the effective implementation of these strategies persist, impacting their overall efficacy. This discussion delineates the key challenges encountered and considers potential solutions to overcome these hurdles, thereby enhancing the well-being of seafarers.

One of the primary challenges in implementing mental health strategies is the limited access to mental health services for seafarers, particularly when at sea. The remote and isolated nature of maritime work complicates the delivery of traditional, face-to-face mental health support, leading to significant gaps in access (Brooks and Greenberg, 2022). Furthermore, even when services are available, utilization rates remain low, often due to the pervasive stigma associated with mental health issues in many seafaring communities. This stigma can deter individuals from seeking help for fear of judgment or repercussions to their career (Li, Zhou, and Yuen, 2022).

The multicultural and multilingual composition of many crews presents additional challenges. Cultural beliefs and language barriers can influence seafarers' perceptions of mental health and their willingness to engage with available support services. Effective communication and culturally sensitive interventions are essential to address these diversity issues, requiring tailored approaches that respect and accommodate the varied backgrounds of seafaring personnel (Main and Chambers, 2020).

Ensuring the successful implementation and sustainability of mental health strategies is another significant challenge. This involves not only the initial introduction of interventions but also their ongoing management, evaluation, and adaptation to changing needs and circumstances. Resource constraints, including financial limitations and a lack of trained personnel onboard ships, can impede these efforts. Moreover, there is often a need for greater awareness and commitment at the organizational level to prioritize mental health as a critical aspect of maritime safety and well-being (Hetherington et al., 2016).

Addressing these challenges requires a multifaceted approach. Enhancing access to mental health services could involve the expansion of telepsychology and digital mental health platforms, offering remote support that circumvents geographical and logistical barriers (Li, Zhou, and Yuen, 2022). Tackling stigma necessitates ongoing education and awareness campaigns that normalize discussions about mental health and emphasize the importance of seeking help. To overcome cultural and linguistic diversity barriers, mental health interventions should be designed with input from seafarers of various backgrounds, ensuring that services are inclusive and accessible to all crew members. This could include multilingual resources and training for mental health professionals in cultural competence (Main and Chambers, 2020).

Furthermore, the implementation and sustainability of mental health strategies can be supported by adopting evidence-based practices, securing organizational commitment, and fostering collaborations between maritime companies, mental health organizations, and researchers. Regular monitoring and evaluation of interventions are crucial to assess

their effectiveness, identify areas for improvement, and adapt strategies to meet evolving needs (Hetherington et al., 2016).

Therefore, while challenges in implementing effective mental health strategies in the marine industry are significant, they are not insurmountable. Through targeted efforts to enhance access, address stigma, accommodate cultural diversity, and ensure the sustainability of interventions, the maritime sector can make substantial progress in supporting the mental health and resilience of seafarers. Such advancements are essential for the well-being of individual seafarers and the overall safety, efficiency, and sustainability of maritime operations.

4.3. The Evolution of Mental Health and Resilience Practices.

The evolution of mental health and resilience practices within the marine industry reflects a growing awareness of the psychological challenges faced by seafarers and a commitment to addressing these issues. This discussion examines the historical developments, current trends, and future directions in mental health and resilience practices, illustrating how the industry has shifted towards a more holistic approach to seafarer well-being.

Historically, the focus within the marine industry was predominantly on physical health, with mental health often relegated to a secondary concern. Early approaches to mental health were largely reactive, centered on addressing severe psychiatric conditions that might compromise a seafarer's ability to perform their duties. However, this narrow focus began to expand as emerging research in the late 20th and early 21st centuries highlighted the prevalence of stress, anxiety, depression, and other mental health issues among maritime personnel (Oldenburg et al., 2010).

The current landscape of mental health and resilience practices is characterized by a more proactive and preventive approach. There has been a notable increase in initiatives designed to enhance seafarers' psychological well-being and resilience, including the implementation of stress management programs, mindfulness training, and interventions aimed at improving onboard living and working conditions (Hetherington et al., 2016). Furthermore, the integration of technology, such as telepsychology services and digital mental health resources, has significantly improved access to support for seafarers, even while at sea (Li, Zhou, and Yuen, 2022).

Another significant trend is the emphasis on organizational culture and its impact on mental health. There is a growing recognition of the need for a supportive and open environment that encourages seafarers to discuss mental health issues without fear of stigma or discrimination. This cultural shift is facilitated by leadership training, awareness campaigns, and the development of policies that prioritize mental health and resilience as key components of maritime safety and operational efficiency (Main and Chambers, 2020).

Looking ahead, the evolution of mental health and resilience practices in the marine industry is likely to continue along the path of integration, innovation, and personalization. One potential area of development is the use of data analytics and wearable technology to monitor seafarers' mental health in real-time, enabling early intervention and tailored support (Stefana et al., 2021). Additionally, there is a growing interest in exploring the role of environmental design in promoting mental health, with research suggesting that modifications to onboard spaces can enhance seafarers' well-being (Doyle et al., 2016).

Collaboration between maritime organizations, mental health professionals, and researchers will be crucial in advancing these initiatives. By fostering a multidisciplinary approach, the industry can leverage diverse expertise to develop innovative solutions that address the complex mental health needs of seafarers. Furthermore, ongoing evaluation and research are essential to assess the effectiveness of current practices and identify areas for improvement.

The evolution of mental health and resilience practices within the marine industry demonstrates a significant shift towards recognizing and addressing the psychological needs of seafarers. By embracing a holistic and proactive approach, the industry is better positioned to support the well-being of maritime personnel, contributing to safer and more productive maritime operations. As the industry continues to evolve, it will be essential to remain adaptable, innovative, and committed to enhancing mental health and resilience among seafarers.

4.4. The Role of Standards and Regulatory Frameworks

The role of standards and regulatory frameworks in enhancing mental health and resilience practices within the marine industry is pivotal. These frameworks serve as benchmarks for the minimum acceptable levels of health and safety practices, including those related to mental health and well-being. The International Maritime Organization (IMO) and the International Labour Organization (ILO) have been instrumental in establishing global standards that impact

seafarers' mental health and resilience. The Maritime Labour Convention (MLC) 2006, often referred to as the "Seafarers' Bill of Rights," represents a comprehensive international legal framework that sets out seafarers' rights to decent conditions of work on a wide range of subjects, including health and safety protection and accident prevention (International Labour Organization, 2006). The MLC emphasizes the need for shipowners to ensure the health and safety of seafarers, including mental health, by mandating access to welfare facilities and support services both onboard and ashore.

Furthermore, the STCW Convention, as amended, outlines mandatory requirements for the training and certification of seafarers, which includes components related to stress management, coping strategies, and team cohesion – all of which are relevant to mental health and resilience (International Maritime Organization, 2010). These regulatory frameworks play a critical role in setting the stage for the implementation of mental health and resilience practices across the industry.

Despite these established standards, the implementation of mental health and resilience practices faces several challenges. Compliance varies significantly across different flags and shipping companies, often influenced by variations in resources, commitment, and understanding of mental health issues. Furthermore, the enforcement of these standards can be challenging, particularly in international waters, where jurisdictional issues and the diversity of national regulations complicate oversight (Hetherington et al., 2016).

Another challenge lies in the specificity of regulations related to mental health. While the MLC 2006 and STCW Convention set broad requirements for health and safety, there is a need for more detailed guidelines that address the nuances of mental health support, including identification, intervention, and continuous care for seafarers experiencing mental health issues (Doyle et al., 2016).

To address these challenges, there is a growing call for the development of more explicit guidelines and standards specifically focused on mental health and resilience. This includes the potential introduction of amendments to existing conventions or the creation of new resolutions that provide clear directives on mental health assessments, onboard support services, and the training of crew members in mental health first aid (Li, Zhou, and Yuen, 2022).

Furthermore, the involvement of seafarers in the development and review of these standards is crucial. Engaging the end-users in the regulatory process ensures that the frameworks are not only comprehensive but also practical and culturally sensitive, reflecting the realities of seafaring life (Main and Chambers, 2020).

The role of standards and regulatory frameworks is fundamental in shaping the landscape of mental health and resilience practices within the marine industry. While significant strides have been made through the MLC 2006 and STCW Convention, ongoing efforts are required to enhance the specificity, enforcement, and practicality of these standards. By addressing these challenges and continuing to evolve regulatory frameworks, the marine industry can better support the mental health and well-being of seafarers, thereby promoting a safer, more resilient, and more productive workforce.

5. Conclusions

The study has elucidated the paramount importance of mental health and resilience within the marine industry, spotlighting the distinct challenges encountered by seafarers due to the isolated and demanding essence of their profession. A salient finding is the augmented awareness surrounding mental health issues, paralleled by the deployment of diverse interventions and programs aimed at mitigating these concerns. Despite such progress, notable gaps persist in terms of access, cultural sensitivity, and the effectiveness of these initiatives. The advent of technology, notably through telepsychology and digital platforms, has been a significant stride forward, furnishing novel modalities for offering support to seafarers regardless of their geographical locations.

Looking into the future, the marine industry is poised at the crossroads of challenges and opportunities concerning the enhancement of mental health and resilience practices. Overcoming the stigma attached to mental health, ensuring the cultural and linguistic appropriateness of interventions, and the uniform implementation of policies across the global spectrum represent the primary hurdles. Conversely, these challenges are met with opportunities through potential technological innovations, the formulation of more targeted and comprehensive training programs, and the increasing acknowledgment of mental health as a critical facet of maritime safety and productivity.

To propel mental health and resilience within the marine industry, it is imperative for industry leaders and policymakers to prioritize the development of accessible, confidential, and culturally sensitive mental health services

for seafarers, leveraging technology to bridge geographical barriers. Additionally, the implementation of comprehensive mental health education and awareness programs that dismantle stigma, foster help-seeking behaviors, and cultivate a supportive onboard culture is crucial. The advocacy for standardization and rigorous enforcement of international policies and regulations supporting mental health and resilience is essential to ensure uniform compliance across the industry. Moreover, allocating resources for the ongoing research and evaluation of mental health interventions is vital for facilitating evidence-based enhancements to programs and practices. Encouraging collaboration between maritime organizations, mental health professionals, and researchers to exchange knowledge, best practices, and innovative solutions to mental health challenges is also recommended.

This study underscores the imperative of prioritizing mental health and resilience as essential components of seafarer well-being and operational efficiency within the marine industry. Future research endeavors should aim to address the existing knowledge gaps, particularly in terms of the long-term effectiveness of current interventions, the influence of cultural factors on mental health outcomes, and the utilization of emerging technologies in providing mental health support. By confronting these areas, the marine industry can more effectively support the mental health and resilience of its workforce, contributing to a safer, more productive, and sustainable maritime future.

Finally, as the marine industry navigates through its approach to mental health and resilience, embracing the forthcoming challenges and opportunities is crucial. By placing the mental health and well-being of seafarers at the forefront of maritime operations, industry leaders, policymakers, and the maritime community can forge a pathway toward a future where the holistic well-being of seafarers is not just aspired to but achieved.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

- [1] Ahvenjärvi, S. (2016). The human element and autonomous ships. *TransNav: International Journal on Marine Navigation and Safety of Sea Transportation*, 10(3), 517-521. <http://dx.doi.org/10.12716/1001.10.03.18>
- [2] Bronfenbrenner, U. (2013). Ecology of the family as a context for human development: Research perspectives. *Adolescents and their families*, 1-20. <https://doi.org/10.4324/9781315827063>
- [3] Brooks, S. K., & Greenberg, N. (2022). Mental health and psychological wellbeing of maritime personnel: a systematic review. *BMC psychology*, 10(1), 139. <https://doi.org/10.1186/s40359-022-00850-4>
- [4] Carotenuto, A., Molino, I., Fasanaro, A. M., & Amenta, F. (2012). Psychological stress in seafarers: A review. *International Maritime Health*, 63(4), 188-194.
- [5] Doyle, N., MacLachlan, M., Fraser, A., Stilz, R., Lismont, K., Cox, H., & McVeigh, J. (2016). Resilience and well-being amongst seafarers: cross-sectional study of crew across 51 ships. *International Archives of Occupational and Environmental Health*, 89, 199-209. <https://doi.org/10.1007/s00420-015-1063-9>
- [6] Engel, G. L. (2012). The need for a new medical model: a challenge for biomedicine. *Psychodynamic psychiatry*, 40(3), 377-396. <https://doi.org/10.1521/pdps.2012.40.3.377>
- [7] Fudge, M., Ogier, E., & Alexander, K. A. (2023). Marine and coastal places: Wellbeing in a blue economy. *Environmental Science & Policy*, 144, 64-73. <https://doi.org/10.1016/j.envsci.2023.03.002>
- [8] Gibbs, M. T. (2009). Resilience: What is it and what does it mean for marine policymakers?. *Marine Policy*, 33(2), 322-331. <https://doi.org/10.1016/j.marpol.2008.08.001>
- [9] Gu, B., & Liu, J. (2024). A systematic review of resilience in the maritime transport. *International Journal of Logistics Research and Applications*, 1-22. <https://doi.org/10.1080/13675567.2023.2165051>
- [10] Hertzog, M. E., & Farber, E. A. (2013). Ordinary Magic: Resilience Processes in Development. In *Annual Progress in Child Psychiatry and Child Development 2002*, (pp. 139-164). Routledge. <https://doi.org/10.4324/9780203955536>
- [11] Hystad, S. W., & Eid, J. (2016). Sleep and fatigue among seafarers: The role of environmental stressors, duration at sea and psychological capital. *Safety and Health at Work*, 7(4), 363-371. DOI: 10.1016/j.shaw.2016.04.002.

- [12] International Maritime Organization. (2010). International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). [London]: International Maritime Organization.
- [13] Iversen, R. T. (2012). The mental health of seafarers. *International maritime health*, 63(2), 78-89.
- [14] Jonglertmontree, W., Kaewboonchoo, O., Morioka, I., & Boonyamalik, P. (2022). Mental health problems and their related factors among seafarers: a scoping review. *BMC public health*, 22(1), 282. <https://doi.org/10.1186/s12889-022-12713-z>
- [15] Li, X., Zhou, Y., & Yuen, K. F. (2022). A systematic review on seafarer health: Conditions, antecedents and interventions. *Transport Policy*, 122, 11-25. <https://doi.org/10.1016/j.tranpol.2022.04.010>
- [16] Long, T. (2024). Why are employee assistance programmes under-utilised and marginalised and how to address it? A critical review and a labour process analysis. *Human Resource Management Journal*. <https://doi.org/10.1111/1748-8583.12547>
- [17] MacLachlan, Main, L. C., & Chambers, T. P. (2015). Factors affecting maritime pilots' health and well-being: a systematic review. *International maritime health*, 66(4), 220-232.
- [18] McVeigh, J., MacLachlan, M., & Kavanagh, B. (2016). The positive psychology of maritime health. *Journal of the Institute of Remote Health Care*, 7(2), 20-28.
- [19] Meichenbaum, Meichenbaum, D. (2017). Stress inoculation training: A preventative and treatment approach. In *The evolution of cognitive behavior therapy* (pp. 101-124). Routledge. <https://doi.org/10.4324/9781315748931>
- [20] Narula, K. (2014). Emerging trends in the shipping industry–transitioning towards sustainability. *Maritime Affairs: Journal of the National Maritime Foundation of India*, 10(1), 113-138. <https://doi.org/10.1080/09733159.2014.928473>
- [21] Oldenburg, M., Baur, X., & Schlaich, C. (2010). Occupational risks and challenges of seafaring. *Journal of Occupational Health*, 52(5), 249-256. DOI: 10.1539/joh.13-0165-RA.
- [22] Othman, R., Faizal, H., & Jeevan, J. (2023). Assessing Occupational Stress in Seafaring: A Fuzzy Delphi Approach to Develop Effective Management Strategies in Offshore Support Vessel Operations. *Transactions on Maritime Science*, 12(02). <https://doi.org/10.7225/toms.v12.n02.011>
- [23] Pfefferbaum, B., Houston, J. B., North, C. S., & Regens, J. L. (2008). Youth's reactions to disasters and the factors that influence their response. *The Prevention Researcher*, 15(3), 3. [10.1901/jaba.2008.15-3](https://doi.org/10.1901/jaba.2008.15-3)
- [24] Sampson, H., & Ellis, N. (2021). Stepping up: the need for proactive employer investment in safeguarding seafarers' mental health and wellbeing. *Maritime Policy & Management*, 48(8), 1069-1081. <https://doi.org/10.1080/03088839.2020.1867918>
- [25] Stefana, E., Marciano, F., Rossi, D., Cocca, P., & Tomasoni, G. (2021). Wearable devices for ergonomics: A systematic literature review. *Sensors*, 21(3), 777. <https://doi.org/10.3390/s21030777>
- [26] Turner, N., Stride, C. B., Carter, A. J., McCaughey, D., & Carroll, A. E. (2012). Job Demands–Control–Support model and employee safety performance. *Accident Analysis & Prevention*, 45, 811-817. <https://doi.org/10.1016/j.aap.2011.07.005>
- [27] Ungar, M. (2008). Resilience across cultures. *British Journal of Social Work*, 38(2), 218-235. DOI: 10.1093/bjsw/bcl343.
- [28] World Health Organization. (2018). Mental health: Strengthening our response. <https://www.who.int/news-room/f>