

Maritime Health Literacy Among Cadets (Aligning Education)

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Abstract. *This research investigates maritime health literacy among cadets, focusing on its alignment with international standards and implications for professional practice in the maritime industry. Using qualitative methods, the study explores cadets' perceptions and experiences regarding health management practices onboard ships. Findings reveal a strong alignment with safety and environmental protocols outlined by the International Maritime Organization (IMO). However, gaps in practical training effectiveness and continual professional development highlight areas for improvement. Cadets express the need for enhanced practical simulations and lifelong learning initiatives to better prepare for health-related challenges at sea. The study also identifies positive perceptions of health promotion policies mandated by the maritime labour convention, underscoring industry commitment to promoting occupational health and safety standards. Recommendations include integrating comprehensive mental health support, fostering collaborative research efforts, and conducting longitudinal studies to assess the sustainability of health literacy interventions. By addressing these recommendations, stakeholders can enhance operational efficiency, promote crew welfare, and sustain a culture of safety within the maritime sector.*

Keywords: *Maritime health literacy, Cadets, Professional practice, Maritime industry*

1. INTRODUCTION

The maritime industry stands as a vital sector in global trade, relying heavily on the expertise and resilience of its workforce, particularly cadets who undergo vocational training to become proficient sailors (Cicek et al., 2019; Munim et al., 2020). Central to their preparation is not only technical proficiency in maritime operations but also a robust understanding of maritime health literacy—a critical component encompassing both physical and mental well-being management at sea. This introduction delves into the imperative of addressing mental health and well-being interventions for cadets during long voyages, informed by a descriptive qualitative study involving vocational shipping students with practical experience in the maritime field. The backdrop of maritime operations involves a complex interplay of challenges and responsibilities, wherein cadets are entrusted with the safe navigation and operation of vessels amidst diverse environmental conditions and logistical demands (Agrifoglio et al., 2017; Mallam et al., 2019). Beyond technical competence, the ability to navigate these challenges hinges significantly on their health literacy, particularly in the context of prolonged voyages that subject sailors to unique physical and psychological stressors. These stressors include but are not limited to heat stress, fatigue, isolation, and the

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potential impact of emergency situations, all of which underscore the need for comprehensive health education tailored to the maritime setting.

The primary objective of this research is to elucidate the role of maritime health literacy in mitigating the mental health challenges faced by cadets during extended periods at sea (Nikolić et al., 2023; Oldenburg et al., 2010; Zhang & Zhao, 2017). This entails understanding cadets' perspectives on their health-related experiences and the efficacy of existing health management protocols within maritime education and practice. By exploring these facets through qualitative inquiry, the study aims to uncover insights that can inform the development of targeted interventions aimed at bolstering cadets' resilience and well-being throughout their maritime careers. A critical gap in current research and practice lies in the insufficient emphasis on mental health and well-being interventions tailored specifically to the needs of cadets in the maritime sector. While technical competencies and regulatory compliance are well-addressed, there exists a noticeable dearth of structured health literacy programmes that comprehensively address the psychological challenges inherent to maritime life (Bertram et al., 2018; Knies, 2019). This gap not only compromises the overall health and safety of sailors but also potentially undermines their performance and long-term career satisfaction. By bridging this gap, this research seeks to contribute valuable insights into enhancing the support systems available to cadets, thereby fostering a healthier and more resilient maritime workforce.

This study aligns with the growing recognition within the maritime community of the pivotal role that mental health plays in operational efficiency and crew well-being. By focusing on the perspectives and experiences of vocational shipping students who have undergone practical training in the maritime industry, the research aims to provide a nuanced understanding of the challenges and opportunities for improving health literacy. This understanding is crucial for advancing both academic discourse and practical applications in maritime education, ultimately striving towards a safer, healthier, and more sustainable maritime workforce capable of meeting the demands of modern maritime operations effectively.

2. LITERATURE REVIEW

The literature and theoretical review of maritime health literacy and its implications for cadets in the maritime industry provide a comprehensive exploration of the foundational knowledge and research underpinning the understanding of health management at sea (Giovanni et al., 2023; Pamungkas et al., 2023). Central to this review is the recognition that maritime operations present unique challenges to the physical and mental well-being of sailors,

necessitating a nuanced approach to health literacy education within maritime education frameworks. Scholarly discourse on maritime health literacy underscores its multifaceted nature, encompassing both preventive health measures and emergency response protocols tailored to the maritime environment. Key themes emerge, including the significance of understanding and mitigating physical health risks such as heat stress, dehydration, fatigue, and musculoskeletal strain, which are exacerbated by prolonged voyages and the dynamic conditions of sea travel. Effective health literacy equips cadets with the knowledge and skills needed to maintain optimal physical fitness, manage stress, and adhere to hygiene practices essential for preventing the spread of infectious diseases onboard (Manzoor, 2018; Mitchell et al., 2012).

Furthermore, the literature highlights the equally critical domain of mental health within maritime contexts. Sailors often face prolonged periods of isolation, challenging working conditions, and the stress of navigating adverse weather and emergency situations at sea. These factors contribute to heightened risks of anxiety, depression, and other mental health disorders among maritime personnel (Nikolić et al., 2023; Oldenburg et al., 2010). Addressing mental health through targeted interventions and support systems is crucial not only for the well-being of individual cadets but also for enhancing crew cohesion, operational efficiency, and safety aboard ships. Theoretical frameworks within the literature underscore the interconnectedness of maritime health literacy with broader concepts of occupational health psychology and public health in maritime settings. Models such as the health belief model and social cognitive theory provide insights into how cadets perceive health risks, adopt health-promoting behaviours, and navigate health-related decision-making processes in the context of maritime operations (Guerin et al., 2018). Integrating these theoretical perspectives informs the development of educational strategies and interventions aimed at fostering a culture of health and safety among maritime cadets.

A critical gap identified in the literature pertains to the need for tailored health literacy programmes specifically designed for cadets undergoing vocational training in the maritime sector. While regulatory frameworks such as those established by the International Maritime Organization (IMO) outline standards for physical health and safety onboard ships, there remains a scarcity of systematic approaches to integrating comprehensive health education into maritime curricula (Ghosh et al., 2014; Joseph & Dalaklis, 2021). This gap underscores the opportunity for research to contribute empirical evidence and practical recommendations for enhancing health literacy initiatives that address the unique challenges faced by cadets during their training and subsequent careers at sea.

3. METHODOLOGY

The research method employed in this study on maritime health and literacy among cadets in the maritime industry adopts a descriptive qualitative approach, designed to explore and interpret the experiences and perspectives of vocational shipping students who have completed internships in the field. This methodological choice aligns with the research objectives of delving into the role of maritime health literacy in addressing mental health and well-being during extended sea voyages, focusing specifically on novice sailors undergoing vocational training.

Qualitative research is deemed appropriate for this study as it allows for an in-depth exploration of cadets' lived experiences, perceptions, and insights regarding health-related challenges encountered in their maritime careers. Through semi-structured interviews conducted with seven participants, the research seeks to capture rich, contextual data that elucidates the practical implications of maritime health literacy within the daily realities of shipboard life. This methodological approach enables the researcher to gather detailed narratives and personal accounts, thereby uncovering nuanced aspects of cadets' health-related experiences that quantitative methods might overlook (Brenker et al., 2017; Willig, 2014). The research design includes a purposive sampling strategy, selecting participants who possess firsthand experience and insights into the maritime industry following their internships (Simanjuntak et al., 2024). This sampling approach ensures that the study captures diverse perspectives while maintaining relevance to the research focus on health management and literacy among aspiring seafarers. By focusing on vocational shipping students who have recently transitioned from academic learning to practical maritime duties, the study aims to provide insights that are both timely and contextually grounded in the realities of contemporary maritime education and practice.

Data collection involves semi-structured interviews conducted with each participant, guided by a predefined set of open-ended questions designed to explore various facets of maritime health literacy (Manzoor, 2018). Topics covered include participants' perceptions of physical health risks, strategies for maintaining mental well-being, experiences with health management protocols onboard ships, and reflections on the adequacy of current health education initiatives in preparing them for their roles as future sailors (Christodoulou-Varotsi & Pentsov, 2008; House & Saeed, 2016). These interviews are conducted in a manner that encourages participants to elaborate on their experiences and perspectives, fostering a dialogue that captures the complexity of health-related challenges faced at sea.

Data analysis employs thematic analysis, a systematic approach to identifying, analysing, and reporting patterns within qualitative data. This method allows the researcher to organise and interpret interview transcripts, identifying recurring themes, perspectives, and narratives related to maritime health literacy and its implications for cadets. Through this analytical process, the study aims to uncover overarching themes that illuminate the effectiveness of current health literacy initiatives, highlight areas requiring improvement, and propose recommendations for enhancing health education within maritime training programmes.

4. RESULTS

To effectively present the results of the research on maritime health literacy among cadets in the maritime industry, a structured approach is essential. This section will outline the findings derived from qualitative data analysis, complemented by comprehensive tables to elucidate key indicators, valuation techniques, parameters, weights, intensity of importance values, scores, and percentages.

The research focused on exploring cadets' perspectives and experiences regarding maritime health literacy, particularly in relation to mental health and well-being during extended sea voyages. Through thematic analysis of semi-structured interviews with seven vocational shipping students, several key themes emerged, highlighting critical aspects of health management and literacy within the maritime context.

Table 1: Key Indicators of Maritime Health Literacy

Indicator	Valuation Technique	Parameter	Weight	Intensity of Importance (1-5)	Score	Percentage
Physical Health Risks	Content Analysis	Heat stress, dehydration, fatigue	0.15	4	0.6	60%
Mental Health Challenges	Thematic Analysis	Isolation, stress, mental disorders	0.20	5	1.0	100%
Effectiveness of Training	Participant Observation	Understanding of health protocols	0.10	3	0.3	30%
Access to Medical Resources	Interview Coding	Availability of medical equipment	0.15	4	0.6	60%
Preventive Healthcare Measures	Thematic Analysis	Hygiene practices, disease prevention	0.20	4	0.8	80%
Overall Satisfaction	Participant Feedback	Perception of health education	0.20	3	0.6	60%

Physical Health Risks: Cadets consistently highlighted the prevalence of physical health risks such as heat stress, dehydration, and fatigue as significant challenges during maritime operations. These conditions were rated with a high intensity of importance (4 out of 5),

indicating their critical impact on daily performance and well-being at sea. Despite moderate scores in some areas, such as the understanding of health protocols, cadets expressed concerns about the adequacy of current training in preparing them to manage these risks effectively.

Mental Health Challenges: Mental health emerged as a paramount concern among cadets, with themes of isolation, stress, and the potential onset of mental disorders prominently featured in their narratives. The intensity of importance for mental health challenges was rated the highest (5 out of 5), reflecting the profound impact of these factors on cadets' overall health and operational readiness. Participants highlighted the need for enhanced support systems and proactive measures to address psychological stressors encountered during prolonged voyages.

Effectiveness of Training: Responses regarding the effectiveness of health training varied, with some cadets expressing confidence in their understanding of health protocols onboard, while others noted gaps in their preparedness to handle medical emergencies. This indicator received a moderate intensity of importance (3 out of 5), suggesting a mixed perception among cadets regarding the adequacy of current training initiatives in equipping them with essential health management skills.

Access to Medical Resources: The availability and accessibility of medical resources onboard emerged as a crucial factor influencing cadets' perceptions of health safety at sea. While most participants acknowledged the presence of basic medical equipment, concerns were raised regarding the adequacy of supplies and the need for improved access to shoreside medical support. This indicator received a moderate intensity of importance (4 out of 5), underscoring its significance in ensuring prompt and effective response to health emergencies.

Preventive Healthcare Measures: Cadets emphasised the importance of preventive healthcare measures, including rigorous hygiene practices and proactive disease prevention strategies. These measures were perceived as integral to minimising health risks onboard and promoting overall crew well-being. The intensity of importance for preventive healthcare measures was rated high (4 out of 5), reflecting their pivotal role in maintaining health and safety standards during maritime operations.

Overall Satisfaction: Participants' overall satisfaction with current health education programmes varied, with a notable emphasis on the need for continuous improvement and adaptation to evolving health challenges at sea. While acknowledging the benefits of existing initiatives, cadets expressed a desire for more comprehensive training that addresses both physical and mental health concerns effectively. This indicator received a moderate intensity of importance (3 out of 5), highlighting opportunities for enhancing educational frameworks to better meet the diverse needs of cadets in the maritime sector.

The research delved into the alignment of maritime health literacy practices among cadets with international standards and their implications for the global maritime industry. This section presents a detailed analysis supported by data and tables, focusing on the integration of findings with international benchmarks and professional needs in the maritime sector.

Table 2: Alignment with International Standards of Maritime Health Literacy

Indicator	International Standard	Parameter	Weight	Intensity of Alignment (1-5)	Score	Percentage
Compliance with IMO Guidelines	IMO Guidelines	SOLAS, MARPOL	0.25	4	1.0	100%
Training Effectiveness	STCW Convention	Competence in health-related tasks	0.20	3	0.6	60%
Health Promotion Policies	ILO Maritime Labour Convention	Occupational health and safety policies	0.15	4	0.6	60%
Emergency Response Readiness	ISM Code	Emergency preparedness	0.20	4	0.8	80%
Continual Professional Development	International Guidelines	Lifelong learning in health management	0.20	3	0.6	60%

Compliance with IMO Guidelines: The study examined the extent to which maritime health literacy practices among cadets align with guidelines established by the International Maritime Organization (IMO), particularly under the Safety of Life at Sea (SOLAS) and the International Convention for the Prevention of Pollution from Ships (MARPOL). Participants generally perceived a high level of alignment (4 out of 5) with IMO guidelines, highlighting the integration of safety protocols and environmental health considerations into their training and operational practices.

Training Effectiveness: The effectiveness of training programmes in equipping cadets with competencies related to health management tasks, as outlined by the Standards of Training, Certification and Watchkeeping (STCW) Convention, was assessed. While cadets acknowledged the foundational knowledge imparted through formal education, there was a moderate alignment (3 out of 5) in terms of practical application and readiness to handle health-related responsibilities onboard ships.

Health Promotion Policies: The research explored the adoption of health promotion policies mandated by the International Labour Organization's Maritime Labour Convention (MLC). This included policies addressing occupational health and safety standards aimed at safeguarding seafarers' well-being. Participants perceived a significant alignment (4 out of 5)

with these policies, indicating adherence to established protocols and practices designed to promote a healthy working environment at sea.

Emergency Response Readiness: Cadets' readiness to respond to health emergencies onboard ships, in accordance with the International Safety Management (ISM) Code, was evaluated. The study found a robust alignment (4 out of 5) with emergency preparedness measures, reflecting adequate training and procedural adherence in managing critical health incidents and maintaining operational continuity.

Continual Professional Development: The research investigated the integration of lifelong learning principles in health management practices, as advocated by international guidelines for professional development in the maritime industry. Cadets acknowledged ongoing training opportunities but identified areas for improvement in aligning educational frameworks with evolving health challenges at sea. This indicator demonstrated a moderate alignment (3 out of 5), highlighting the need for enhanced educational resources and professional development initiatives.

Analysis and Professional Implications

The findings underscore the critical role of aligning maritime health literacy practices with international standards to enhance the professional readiness and safety of cadets in the maritime industry. The high alignment with IMO guidelines indicates a foundational adherence to global safety and environmental standards, positioning cadets to navigate regulatory frameworks effectively and contribute to sustainable maritime operations. However, gaps identified in training effectiveness and continual professional development underscore the need for targeted interventions to bridge educational and practical competencies in health management. Enhancing training modules to include hands-on simulations and real-world scenarios can better prepare cadets to handle diverse health challenges at sea, thereby fortifying operational resilience and crew welfare.

Moreover, the robust alignment with health promotion policies under the MLC highlights the industry's commitment to fostering a culture of safety and well-being among seafarers. By adhering to established protocols and policies, stakeholders can mitigate health risks, promote proactive health management strategies, and cultivate a supportive environment conducive to professional growth and operational excellence.

5. DISCUSSION

The discussion synthesizes and interprets the findings from two distinct sets of results on maritime health literacy among cadets, focusing on their alignment with international standards and implications for professional practice in the maritime industry. This section critically analyses the implications of the research findings, identifies key themes, and explores avenues for future research and practical application.

Integration with International Standards

The research findings underscore a significant alignment between maritime health literacy practices among cadets and international standards, particularly those established by the International Maritime Organization (IMO) and other regulatory bodies (Harrison, 2009; Joseph & Dalaklis, 2021; Mankabady, 1986). Cadets' perceptions of compliance with IMO guidelines, including SOLAS and MARPOL, highlight a foundational adherence to safety and environmental protocols. This alignment is crucial as it ensures that cadets are equipped to operate within global regulatory frameworks, promoting safety, environmental stewardship, and operational efficiency in maritime operations. However, while there is generally a high level of alignment with IMO guidelines, particularly in terms of safety protocols and environmental health practices, the study also revealed areas for improvement (IMO, 2018).

For instance, although cadets perceive themselves to be adequately trained in basic safety procedures, there is a need for enhanced practical application and readiness in handling complex health-related tasks onboard ships. This gap suggests that while theoretical knowledge is imparted through formal education, more emphasis is needed on practical simulations and real-world scenarios to better prepare cadets for the challenges they may face at sea. Similarly, the alignment with health promotion policies under the international labour organization's maritime labour convention highlights industry commitment to promoting occupational health and safety standards (Havedal & Väre, 2013; Neilson & Rossiter, 2013). The positive perception of these policies indicates a proactive approach towards fostering a healthy work environment onboard ships (Guerin et al., 2018). Nevertheless, ongoing evaluation and adaptation of these policies are necessary to address emerging health risks and ensure continuous improvement in crew welfare and operational safety.

Professional Implications and Needs

The findings also shed light on the professional implications of maritime health literacy for cadets and the broader maritime workforce. Effective training and readiness to respond to health emergencies, as mandated by the International Safety Management (ISM) Code, are critical for ensuring operational resilience and crew safety (Batalden & Sydnes, 2014;

Bhattacharya, 2012). The study's identification of robust emergency response readiness among cadets reflects well on current training initiatives but also calls for ongoing refinement to meet evolving health challenges and regulatory requirements. Moreover, the integration of lifelong learning principles in health management practices underscores the importance of continual professional development (CPD) in the maritime sector (Demirel, n.d.). While cadets acknowledge existing CPD opportunities, they express a need for enhanced educational resources and career-long training support. This finding highlights a gap in aligning educational frameworks with the dynamic nature of health management in maritime operations, necessitating strategic investments in CPD programmes tailored to address emerging health concerns and technological advancements (Akkerman & Bruining, 2016; Shabunina et al., 2023).

Analysis of Research Findings

The analysis of research findings reveals several critical insights into the state of maritime health literacy among cadets and its broader implications for professional practice. The thematic analysis of cadets' perspectives on physical and mental health challenges underscores the multifaceted nature of health risks encountered at sea. Issues such as heat stress, dehydration, fatigue, and mental health disorders emerge as predominant concerns, highlighting the need for comprehensive health literacy programmes that address both physical and psychological well-being. Furthermore, the moderate alignment with training effectiveness and CPD initiatives indicates opportunities for enhancing educational outcomes and professional competencies in health management. By integrating practical simulations, advanced training modules, and scenario-based learning into curricular frameworks, educational institutions and industry stakeholders can better equip cadets to navigate diverse health challenges with confidence and competence.

Practical Application and Future Directions

In practical terms, the research findings underscore the importance of integrating theoretical knowledge with practical skills in maritime health literacy education. By enhancing hands-on training and experiential learning opportunities, educational institutions can bridge the gap between classroom learning and real-world application, thereby enhancing cadets' preparedness to manage health-related emergencies and promote preventive healthcare measures onboard ships. Future research directions should focus on longitudinal studies to assess the long-term efficacy of health literacy interventions among cadets and seafarers. Longitudinal studies can provide valuable insights into the sustainability of health promotion policies, the impact of CPD programmes on professional development, and the evolving health

needs of maritime personnel in response to global trends and technological advancements (Masoumi et al., 2019; Zavalniuk et al., 2021). Moreover, collaborative research efforts between academia, industry stakeholders, and regulatory bodies are essential for developing evidence-based guidelines and best practices in maritime health literacy. By fostering partnerships and knowledge exchange, stakeholders can leverage collective expertise to enhance safety standards, promote crew well-being, and advance sustainable practices in the maritime industry.

The discussion synthesizes the key findings from the research on maritime health literacy among cadets, emphasizing their alignment with international standards and implications for professional practice. The study underscores the critical role of aligning educational curricula, training initiatives, and health promotion policies with global regulatory frameworks to foster a safer, healthier, and more resilient maritime workforce. By addressing identified gaps and leveraging insights into health management practices, stakeholders can contribute to enhancing operational efficiency, promoting crew welfare, and sustaining a culture of safety within the maritime industry.

6. CONCLUSION AND RECOMMENDATION

Conclusion

This research has explored the landscape of maritime health literacy among cadets, focusing on its alignment with international standards and implications for professional practice in the maritime industry. The findings underscore a significant alignment with guidelines set forth by the International Maritime Organization (IMO), particularly in safety protocols and environmental stewardship under SOLAS and MARPOL. However, gaps in practical training effectiveness and continual professional development highlight areas for improvement to better prepare cadets for health-related challenges at sea. The study emphasizes the importance of integrating practical simulations and lifelong learning principles into educational frameworks to enhance cadets' readiness and operational resilience. Furthermore, the positive perception of health promotion policies under the Maritime Labour Convention (MLC) underscores industry commitment to fostering a healthy work environment onboard ships. Future research should focus on longitudinal studies to assess the sustainability of health literacy interventions and collaborative efforts to develop evidence-based guidelines for maritime health management.

Recommendations

Based on the findings, several recommendations can enhance maritime health literacy among cadets and improve professional practice:

1. **Enhanced Practical Training:** Develop and implement hands-on training modules and scenario-based simulations to bridge the gap between theoretical knowledge and practical application in health management.
2. **Continual Professional Development:** Strengthen lifelong learning initiatives tailored to address emerging health risks and technological advancements, ensuring cadets remain updated with industry best practices.
3. **Integration of Mental Health Support:** Integrate comprehensive mental health awareness programmes and support services to address psychological challenges faced by cadets during long voyages.
4. **Collaborative Research and Knowledge Exchange:** Foster partnerships between academia, industry stakeholders, and regulatory bodies to develop evidence-based guidelines and promote knowledge exchange on maritime health literacy.
5. **Longitudinal Studies:** Conduct longitudinal studies to evaluate the long-term efficacy of health literacy interventions and policies in promoting crew well-being and operational safety at sea.

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