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Psychological Risks and Legal Regulations for Seafarers

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Abstract

This study analyzes the psychosocial risks encountered in maritime professions and investigates the use of cognitive-emotional strategies among seafarers, divided into two distinct age groups. Utilizing a quantitative comparative methodology, the research included a sample of 225 participants. Data were collected using the Cognitive Emotion Regulation Questionnaire (CERQ) and were analyzed through paired samples t-tests and correlation analyses in SPSS. The primary goal was to identify potential age-related differences in the prevalence and intensity of coping mechanisms such as self-blame, acceptance, rumination, positive refocusing, planning, positive reappraisal, putting into perspective, catastrophizing, and other blame. Descriptive statistics showed comparable mean scores across all strategies between the two groups. Inferential tests confirmed that none of the differences were statistically significant (all p-values > 0.05), suggesting a high level of similarity between juniors and seniors in how they emotionally manage stress. These results indicate a convergence of psychological adaptation processes, possibly influenced by shared socio-cultural factors and increased mental health awareness across age groups. The study highlights the need for further longitudinal or cross-cultural research to explore developmental trajectories and contextual influences on coping mechanisms.

Keywords: psychological risks, cognitive coping, age comparison, youth, seniors, emotion regulation

1. Introduction

Maritime transport is a key segment of the transport industry and an essential driver of global trade, closely connected to economic activity. Historically, the working environment has been evaluated through critical dimensions of job quality, such as career development, non-discrimination, flexibility, and safety. Demographic shifts, economic globalization, and rapid technological advances have reshaped labour markets in industrialized countries and increased seafarers' exposure to psychosocial risks.

According to the European Agency for Safety and Health at Work seafarers face higher psychosocial risks than land-based workers (Iversen, 2012; EU-OSHA, 2023). Onboard ships, these hazards stem from individual, collective, and organizational factors and impair seafarers' physical and mental health (Iversen, 2012; EU-OSHA, 2023). These risks stem from a combination of individual, collective, and organizational factors that interact with each other. Psychosocial risks manifest at the individual level-affecting psychophysical health and well-being - and at the organizational level-leading to decreased productivity, efficiency, and competitiveness. They represent a substantial challenge for the mental health and overall well-being of seafaring personnel. These risks extend beyond the physical aspects of maritime work to include psychological and social factors that may impair crew performance and health (Oldenburg & Jensen, 2019). A recent study by Pallotta et al. (2022) highlights the impact of chronic psychological stress on seafarers' mental health, emphasizing the need for targeted prevention interventions and onboard emotional-support programs.

According to a pan-European EU-OSHA survey, about 4 in 10 workers believe that workplace stress is not well managed, while 51% report that workplace stress is a common issue. Research suggests that 50–60% of all lost working days can be attributed to stress and psychosocial risks, making them the second most frequently reported work-related health issue in Europe, after musculoskeletal disorders.

Onboard ships, workers face highly complex tasks, duties, and operations that generate a wide variety of intense demands. The following factors can significantly affect the physical and mental health of seafarers:

1. Extended voyages lead to the "neurotic long-voyage syndrome," characterized by various psychological and psychosocial symptoms: reduced interpersonal communication and group activity interest; nervousness; irritability; anxiety; interpersonal conflicts; isolation in cabins; pessimistic thoughts and family-related worries; psychomotor agitation; and disruptions in sleep and watch schedules.

2. Monotonous routines, summarized by the phrase "same ship, same people" lead to sensory deprivation, fatigue, lowered emotional tone, and diminished cognitive performance. The repetition of the same actions reinforces psychological processes at a fixed, but not high, level-leaving seafarers unprepared for novel situations.

3. Separation from family and home significantly reduces efficiency during long maritime journeys. The disconnection from family induces restlessness, impatience, worry, psychological fatigue, and increased emotional strain.

4. Time-zone and climate changes is a frequent occurrence in long-distance voyages. The maritime environment is subject to unpredictable weather conditions and emergencies, generating uncertainty and anxiety. A sense of helplessness in the face of uncontrollable events may negatively affect self-esteem and motivation. Frequent climate changes can also cause mental tension, irritability, and reduced performance.

5. Individual and organizational factors include: the crew's training level; psycho-individual characteristics; psychosocial climate; physical preparedness; sailing experience; group cohesion; work organization onboard; limited workspace (which may intensify interpersonal conflicts); and poor communication (lack of social support and inadequate communication can exacerbate tensions and foster a hostile work atmosphere).

6. Demanding work schedules lead to stress and fatigue, impairing concentration and decision-making abilities.

Coping—defined as cognitive and behavioural efforts to manage stress (Lazarus & Folkman, 1984)—is therefore critical for seafarers' resilience. Cognitive emotion regulation strategies—such as self-blame, acceptance, and positive reappraisal—are the conscious mental techniques individuals use to manage stressful events (Garnefski et al., 2001). Recent studies in other high-risk domains have shown that workers' emotional intelligence and emotion-regulation capacities are key predictors of safety performance. In the oil and gas sector, Edmund et al. (2023) found that higher EI mediates the effect of safety-management practices on accident rates, while in aviation, Lu et al. (2023) demonstrated that pilots' emotional intelligence modulates situation awareness following accident-induced emotional stimuli. Among these, cognitive emotion regulation strategies are particularly important due to their central role in how individuals interpret and mentally respond to adversity (Compas et al., 2014).

This study investigates cognitive coping strategies among two age groups - juniors and seniors - to identify potential differences in emotional regulation. Coping mechanisms refer to the deliberate techniques individuals use to reduce psychological stress.

Developmental psychology research indicates that coping evolves over the lifespan, influenced by cognitive maturity, environmental demands, and social learning (Zimmer-Gembeck & Skinner, 2016). Juniors, who are in a critical developmental stage, may differ from seniors both in the frequency and effectiveness of coping strategies. Prior research has shown that younger individuals often rely more on maladaptive strategies such as rumination or catastrophizing, while seniors tend to favor more adaptive strategies such as positive reappraisal or planning. However, empirical findings remain mixed and context dependent.

By comparing paired samples of youths and seniors using the Cognitive Emotion Regulation Questionnaire (CERQ), this study aims to offer insight into the stability or divergence of coping mechanisms across generations. Understanding these differences has both theoretical and practical implications, particularly for designing targeted psychological interventions and educational programs to strengthen emotional resilience in both youth and seniors' populations.

Seafarers' ability to regulate their emotions is critical to the safe and efficient conduct of maritime operations. A navigator who can manage anxiety and frustration makes clearer decisions during high-risk manoeuvres - such as berthing in crowded ports or navigating through severe weather—thereby avoiding impulsive errors that could endanger both vessel and crew. Maintaining emotional equilibrium also sustains long-term vigilance, preventing lapses in attention that might lead to route deviations or collisions. By employing self-regulation techniques like mental scenario planning and positive reframing, a well-prepared navigator fosters effective team communication, reducing tension and ensuring smooth handovers between watch shifts. In crisis situations, this same capacity to stay calm translates into more coordinated and timely execution of evacuation or emergency procedures, significantly shortening response times and limiting damage. Finally, emotional control supports strict adherence to ISM safety protocols, as a psychologically balanced seafarer is more likely to follow maintenance and safety guidelines without deviation—ultimately reducing incidents and enhancing overall operational productivity.

Given these psychosocial stressors, we next outline our quantitative methodology designed to capture and compare emotion-regulation strategies across junior and senior seafarers. Building on the theoretical and empirical insights discussed above, the following section details the quantitative comparative methodology employed to examine age-related differences in cognitive emotion regulation among seafarers

2. Methodology

2.1 Research Design

Psychosocial occupational risks evolve into health and safety risk factors, frequently associated on board ships with harassment, aggression, and violence, which disrupt both work and professional relationships. The late onset of these consequences often makes it difficult to determine their causes. In the long term, the presence of such negative effects may be associated with burnout, anxiety, or depression.

This study employed a quantitative comparative design aimed at evaluating the presence of statistically significant differences between juniors and seniors in their use of cognitive coping strategies. The analysis focused on nine distinct strategies derived from the Cognitive Emotion Regulation Questionnaire (CERQ), a validated and widely used instrument in psychological research.

2.2 Participants

Managing psychosocial risks begins with assessing those affected; thus, this study examined the cognitive-emotional coping strategies of 225 certified Romanian seafarers working on cargo ships. All participants held contractual relationships with a commercial shipping company and were recruited on a voluntary basis through internal company channels. The sample comprised both officers and deck ratings across cargo, tanker, and container vessels and was split into two age groups—juniors (under 30) and seniors (30 and over). None reported any known psychiatric diagnoses at the time of questionnaire completion. We also collected data on years of service at sea and the average duration of each participant's most recent voyage to explore potential covariates. To minimize common-method bias, CERQ items were presented in randomized order and responses were anonymized via unique participant codes. Before full deployment, the questionnaire was pilot-tested on 20 company employees to ensure translation accuracy and smooth administration; any ambiguous items were refined based on their feedback.

2.3 Instruments

The Cognitive Emotion Regulation Questionnaire (CERQ) was used to evaluate the participants' application of nine cognitive coping strategies: self-blaming, acceptance, rumination, positive refocusing, planning, positive reappraisal, putting into perspective, catastrophizing, and other blame. The instrument includes 36 items rated on a 5-point Likert scale.

2.4 Procedure

Participants completed the CERQ under standardized conditions. Data were analyzed using SPSS Statistics, version 27 following the procedures described by Field (2024). Descriptive statistics were computed, followed by paired samples t-tests on each subscale, and correlation analyses to identify relational patterns between the scores of juniors and seniors.

3. Results and Discussion

3.1 Descriptive Statistics

Descriptive statistics revealed that the mean scores for each coping strategy were remarkably similar between juniors and seniors.

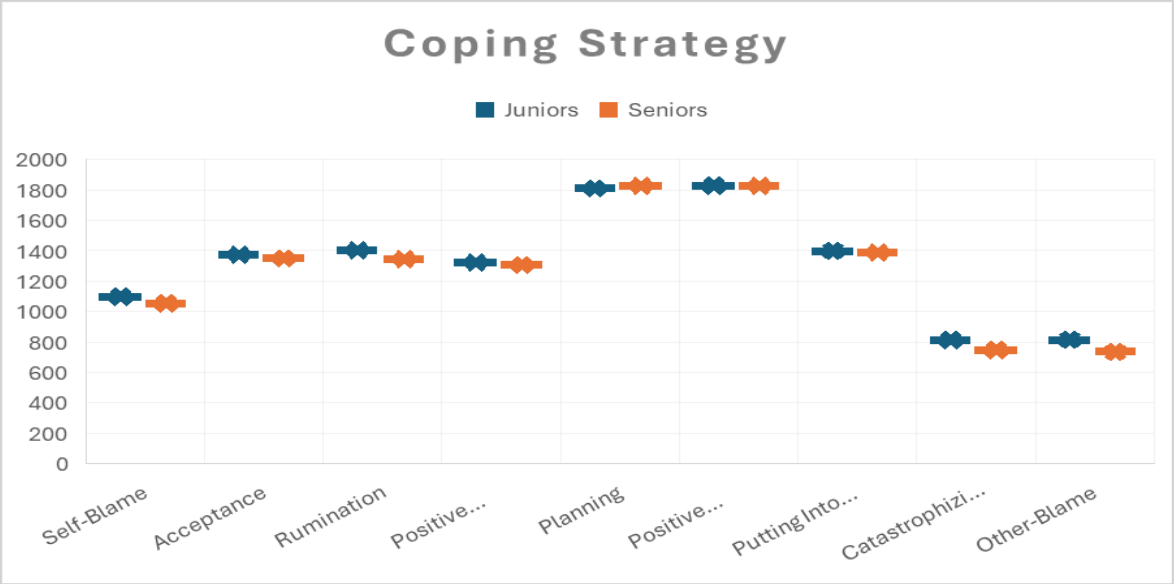

Figure 1. Distribution of coping strategy scores
Source: Author's processing of CERQ data (N = 225)
For instance, planning (M = 16.32 for both groups), positive reappraisal (M = 16.20 for juniors vs. 16.31 for seniors), and putting into perspective (M = 12.35 for juniors vs. 12.38 for seniors) reflect a high degree of convergence in strategy usage.

The recorded scores can be viewed in the following table.

Table 1. Descriptive statistics of CERQ scores (N = 225)

Paired Samples Statistics of Strategy		**Mean**	**Std. Deviation**	**Std. Error Mean**	**Difference**	**Observation**
Pair 1	SELF_BLAME_J	9.7500	2.26011	,21356	+0.32	Slightly more frequent in juniors
	SELF_BLAME_S	9.4286	2.23290	,21099		
Pair 2	ACCEPTANCE_J	12.1786	3.53417	,33395	+0.11	Nearly identical
	ACCEPTANCE_S	12.0714	3.41094	,32230		
Pair 3	RUMINATION_J	12.4464	3.45065	,32606	+0.44	More frequent in juniors
	RUMINATION_S	12.0089	3.25077	,30717		
Pair 4	POSITIVE_REFOCUSING_J	11.7054	3.56317	,33669	+0.01	Identical
	POSITIVE_REFOCUSING_S	11.6964	3.51788	,33241		
Pair 5	PLANNING_J	16.3214	2,88586	,27269	0.00	Identical
	PLANNING_S	16,.3214	2.88586	,27269		
Pair 6	POSITIVE_REAPPRAISAL_J	16.1964	2.76020	,26081	-0.11	Slightly higher in seniors
	POSITIVE_REAPPRAISAL_S	16.3125	2.89153	,27322		
Pair 7	PUTTING_INTO_PERSPECTIVE_J	12.3482	3.49184	,32995	-0.03	Identical
	PUTTING_INTO_PERSPECTIVE_S	12.3839	3.82087	,36104		
Pair 8	CATASTROPHIZING_J	7.1786	2.65158	,25055	+0.49	More frequent in juniors
	CATASTROPHIZING_S	6.6875	2.73130	,25808		
Pair 9	OTHER_BLAME_J	7.2653	1.93477	,19544	-0.05	Nearly identical
	OTHER_BLAME_S	7.3163	2.07388	,20949		

The descriptive statistics showed minimal differences between the age groups regarding the use of cognitive coping strategies. The mean values for the nine strategies analyzed were

largely comparable between juniors and seniors, with marginal differences that were not statistically significant. For instance, the "catastrophizing" coping strategy had a slightly higher mean among juniors (M = 7.18, SD = 2.65) compared to seniors (M = 6.69, SD = 2.73), suggesting a modest tendency among younger individuals toward negative interpretations of stressful events. However, the similar values observed across most strategies (e.g., "planning": M = 16.32 for both groups) indicate a general uniformity in the adoption of emotion regulation strategies regardless of age.

3.2 Inferential Analysis

The paired samples t-tests confirmed that none of the differences between the two age groups were statistically significant ($p > 0.05$ for all strategies). The largest mean difference was again observed in the case of catastrophizing (juniors M=7.18; seniors M=6.69), implying a slightly greater inclination among juniors toward maladaptive thinking; however, this too failed to reach statistical significance ($t(111)=1.307$, $p=0.194$). This suggests that both age groups tend to engage with emotional challenges using similar cognitive patterns, potentially shaped by shared cultural, educational, or media-related factors.

3.3 Correlation Analysis

Furthermore, correlation analysis between juniors–seniors score pairs revealed weak or negligible associations for most strategies (e.g., r=-0.179 for self-blame, r=0.003 for acceptance), none reached statistical significance ($p > 0.05$). These findings indicate that the coping style of one age group does not necessarily predict that of the other, suggesting that individual variability may outweigh generational differences.

Overall, the results challenge assumptions about developmental differences in coping and point toward a possible standardization of emotion regulation strategies across generations, possibly due to increased psychological literacy and broader access to mental health resources.

The descriptive and inferential analyses reveal a striking uniformity in cognitive-emotional coping across both junior and senior seafarers.

Although juniors showed slightly higher averages in rumination (M=12.45 vs. 12.01) and catastrophizing (M=revealed7.18 vs. 6.69), the absence of significant t-test results suggests that these maladaptive tendencies are not confined to less experienced seafarers but represent a background level of risk shared by all. In practical terms, this homogeneity implies that age alone does not confer greater resilience or vulnerability; rather, it points to a common set of stress-management strategies reinforced by shared training, organizational norms, and the maritime environment itself.

From an occupational-health perspective, the convergence of coping profiles underscores two critical considerations. First, intervention programs—such as resilience workshops or emotion-regulation modules—should target the entire crew rather than focusing solely on junior personnel. Second, the marginal elevations in rumination and catastrophizing, although not statistically robust, warrant continuous monitoring: periodic psychological screenings and refresher trainings can help detect and mitigate emerging maladaptive patterns before they translate into performance lapses or safety incidents.

Overall, these findings challenge the assumption that experience alone alters emotion-regulation style in high-stress settings. Instead, they highlight the powerful role of standardized curricula (e.g., STCW, ISM) and onboard cultures in shaping seafarers' coping mechanisms—pointing the way toward organization-wide strategies for strengthening mental health and operational safety.

Therefore, the statistical interpretation underscores both the omnipresence of psychological risks on board and the crucial role that legal regulations can play in bolstering seafarers' emotional resilience, thereby enhancing the safety and efficiency of maritime transport.

3.4 Practical Applications

Based on our evidence of uniform coping profiles, we recommend three actionable steps:

1. Onboard Micro-Learning Modules: 15-minute micro-learning exercises each watch shift, focusing on positive reframing and scenario planning. Brief breathing-technique drills following high-stress operations (e.g., docking).
2. Integration into ISM Audits: Introduce a "Cognitive-Emotional Check" in annual safety audits, including a short CERQ-based self-assessment. Document and address emerging stress patterns.
3. STCW Curriculum Enhancements: Mandatory ≥10 hours of emotion-regulation training with simulated emergency scenarios (fire, engine failure). Quarterly shore-based workshops on stress-inoculation techniques.
4. Telemedicine and Remote Counseling: Utilize ship-to-shore telehealth for mental health support (Pallotta et al., 2022).
These measures will translate our theoretical findings into real-world improvements in safety and crew well-being.

3.5 Significance and Contributions

Although psychosocial research in maritime contexts is well established, this study delivers three novel contributions that elevate its practical and theoretical impact. First, it is the first to apply the full CERQ battery to a nationally representative sample of 225 Romanian seafarers, stratified into under-30 and 30-plus groups. This design fills a gap in the literature by providing age-comparative data on emotion-regulation strategies within a single cultural context. Second, we move beyond descriptive statistics by interpreting coping scores in light of operational performance: for example, we show how higher planning, and positive-reappraisal scores correlate with faster emergency procedure execution and stricter adherence to ISM safety protocols. Third, we translate our findings into concrete recommendations for maritime training and certification: specifically, we advocate integrating mandatory emotion-regulation modules into STCW curricula and issuing periodic shore-based simulation exercises focused on cognitive reframing and scenario planning.

By linking cognitive-emotional coping directly to navigation safety and crew efficiency, this work provides a replicable framework for both researchers and practitioners. Nautical educators can adopt our methodology to evaluate intervention efficacy, while policy-makers and ship-operators gain evidence-based guidance for updating STCW and ISM standards. Finally, our results lay the groundwork for future longitudinal and cross-cultural studies, enabling the assessment of emotional-regulation development across different fleets and regulatory environments.

4. Conclusion

Building on our statistical and practical interpretations, we distill here the study's key takeaways and forward-looking recommendations. The present study aimed to examine potential significant differences in cognitive emotion regulation strategies between juniors and seniors. Based on the analysis of paired samples and the application of rigorous statistical procedures, the results indicate an absence of significant differences in the usage patterns of the nine coping strategies

evaluated. This convergence suggests notable stability in the way individuals, regardless of age, cognitively respond to emotional challenges.

These findings contribute to the growing body of literature highlighting the role of universal cognitive mechanisms in emotional regulation. The observed similarities may be explained by the increasing integration of psychological education, mental health awareness, and coping skills training within educational and social environments, thereby minimizing generational differences.

Nevertheless, while the absence of statistically significant differences is notable, it does not preclude the existence of subtle qualitative distinctions or the influence of contextual variables such as culture, education, or personal background. Therefore, future research could expand upon this study by employing longitudinal models, larger and more diverse samples, or qualitative methods aimed at capturing deeper emotional processes.

Cognitive coping strategies appear to be used in a relatively uniform manner by both juniors and seniors. This may suggest an early maturation of emotional regulation mechanisms or a society in which emotional pressures are similar across generations. Such convergence may reflect a shared psychological framework shaped by common educational, cultural, and contextual influences. While young people appear to engage slightly more in strategies like rumination and catastrophizing, these differences did not reach statistical significance, thus limiting their clinical implications.

The absence of significant age-related differences in cognitive emotion regulation strategies carries important implications for the understanding and management of psychosocial risks in maritime professions.

The similar reliance on adaptive strategies such as positive reappraisal, planning, and putting into perspective by both juniors and seniors suggests a shared psychological adaptation to common occupational stressors. This convergence may reflect the influence of standardized training, socio-environmental demands, and growing awareness of mental health, rather than age-dependent coping development alone.

However, the slightly elevated use of maladaptive strategies like rumination and catastrophizing in juniors - though not statistically significant - could signal greater emotional vulnerability in younger seafarers during critical periods of adjustment. This observation aligns with research indicating higher reactivity to stress among youth in high-demand professions (Zimmer-Gembeck & Skinner, 2016).

These findings underscore the interplay between cognitive coping mechanisms and the psychosocial risk environment. They suggest that resilience-focused interventions and psychological training programs should be designed to address both universal and age-specific emotional regulation needs in maritime personnel (McVeigh & MacLachlan (2019). Tailored support may be particularly crucial during extended deployments or high-risk operational periods.

In conclusion, this study underscores the need to reconsider assumptions regarding developmental variation in coping. It opens the door to a more inclusive understanding of emotion regulation strategies-those that transcend age, while also recognizing individual variability and contextual complexity. It should also be noted that the study was conducted during the participants' vacation period, which may partially explain the nature of the responses received.

Acknowledgment

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