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Building Psychological Resilience in Maritime Cadets: A Mixed-Methods Investigation of Stressors, Protective Factors, and Support Interventions in Indonesian Maritime Education

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ABSTRACT

Maritime cadet training involves significant psychological demands that contribute to burnout, attrition, and mental health challenges, yet maritime education institutions rarely address resilience systematically. This mixed-methods study examined psychological stress factors, resilience-building mechanisms, and effectiveness of peer mentoring and digital wellness interventions among 287 maritime cadets from STIP Jakarta and affiliated maritime schools. Qualitative interviews with 42 cadets, educators, and mental health professionals identified primary stressors: academic performance anxiety, homesickness, separation from families due to practical sea training, insufficient sleep, and concern about employment prospects. Resilience factors included peer support networks, meaningful instructor relationships, clear career pathways, and institutional recognition of psychological wellbeing. Quantitative survey analysis (Cronbach's α = 0.82) revealed that cadets with structured peer mentoring reported 34% lower stress symptoms and 28% higher psychological well-being compared to peers without mentoring support. A pilot digital wellness platform with mobile notifications for mindfulness exercises, emotional check-ins, and peer connection features demonstrated feasibility and user acceptance (mean satisfaction rating 4.2/5.0). The integrated support model combining peer mentoring, instructor recognition of mental health dimensions, curricular resilience-building activities, and accessible digital wellness resources produced measurable improvements in cadet psychological wellbeing while maintaining academic rigor. Findings demonstrate that maritime institutions can integrate mental health support into professional training without compromising maritime safety standards or operational competency development.

Keywords : *Maritime cadets; Psychological resilience; Mental well-being; Peer mentoring; Stress management; Maritime education; Wellness interventions*

1. INTRODUCTION

The maritime profession demands extraordinary psychological resilience from its practitioners, yet maritime cadet training programs rarely address mental health systematically or integrate resilience-building deliberately into educational curricula. Maritime cadets face a unique constellation of psychological stressors that distinguish their training experience from most other professional preparation programs: extended separation from family and social support networks during mandatory sea training periods lasting months, intense academic performance pressure combined with simultaneous development of complex practical competencies, hierarchical organizational cultures that historically have discouraged emotional expression or vulnerability, uncertain employment prospects in a competitive global shipping industry, and the psychological

burden of training for a profession where operational errors can result in catastrophic consequences affecting crew safety and environmental protection. Despite these substantial psychological demands, many maritime institutions perpetuate a cultural paradigm that views expressions of psychological difficulty as manifestations of weakness rather than as normal human responses to extraordinary circumstances requiring systematic institutional support (Sabri et al., 2022; Buddha et al., 2024).

The engagement hook for this research lies in recognizing that cadet attrition from maritime programs—often attributed to perceived lack of career opportunity or insufficient academic capability—frequently masks underlying psychological distress that institutional support systems failed to address. Maritime industry human resource professionals increasingly report that while many young people initially pursue maritime careers, a substantial proportion abandon the profession within the first 3-5 years, citing burnout, inadequate compensation for psychological demands, and dissatisfaction with workplace culture. When maritime educators investigate why promising cadets who successfully complete training programs later leave the profession, psychological stress and unsupported transitions emerge as frequently as salary concerns. This pattern suggests that maritime education institutions inadvertently contribute to professional attrition by failing to prepare cadets psychologically for the demanding maritime workplace environment or to build resilience capacities that sustain well-being across decades-long maritime careers. Furthermore, growing recognition within global maritime organizations that operational errors often reflect crew fatigue and mental health challenges rather than technical incompetence has directed increased attention toward psychological well-being as a maritime safety issue rather than solely as a human services concern (Fernández Otoya et al., 2024).

Existing knowledge regarding maritime cadet psychology remains surprisingly limited despite the magnitude of psychological demands inherent in maritime training. While substantial research literature examines stress and burnout in healthcare, military, and emergency response training contexts—professions sharing several psychological characteristics with maritime training—comparable systematic investigation of maritime cadet experiences remains sparse. General educational research demonstrates consistently that peer support and mentoring significantly buffer stress impacts, improve academic persistence, and enhance overall psychological well-being across diverse educational contexts. Studies of professional training programs in healthcare and aviation illustrate that explicit institutional attention to trainee mental health—including peer mentoring programs, counselor accessibility, stress management training, and organizational culture change emphasizing psychological safety—produces measurable improvements in trainee retention and professional satisfaction. Yet these evidence-based practices remain inconsistently implemented across maritime education institutions, with many programs continuing to operate under assumptions that psychological challenges represent individual trainee deficiencies rather than predictable responses to extraordinary demands requiring systematic institutional response (Yuebo et al., 2024).

The central research problem guiding this investigation is therefore formulated as: **How can maritime educational institutions systematically identify psychological stressors affecting cadet well-being and develop integrated support interventions—including peer mentoring, counseling accessibility, curricular resilience training, and digital wellness tools—that sustain psychological health and reduce attrition while maintaining the rigor and safety standards essential to maritime professional preparation?** This overarching question encompasses several specific research objectives. First, the research seeks to identify and characterize the specific psychological stressors that maritime cadets experience, distinguishing between stressors common to professional training generally and those unique to maritime contexts. Second, the research aims to identify protective factors and existing resilience mechanisms that cadets currently employ, recognizing that most cadets complete training successfully and deserve understanding of how they maintain psychological health despite substantial demands. Third, the research intends to evaluate the effectiveness of evidence-based support interventions—particularly peer mentoring programs and digital wellness platforms—within maritime education contexts. Fourth, the research seeks to develop and pilot-test an integrated support model that embeds resilience-building and mental health support into maritime curricula and institutional culture rather than positioning these as auxiliary services. Finally, the research aims to generate implementation guidance for maritime educators and institutional leaders regarding how to establish sustainable support systems within resource-constrained maritime education environments common in developing maritime sectors.

The rationale and significance of this research extends across multiple dimensions. At the human level, maritime cadets represent young adults typically in their late teens or early twenties who deserve institutional environments supporting their overall development and well-being rather than environments that normalize psychological distress or pathologize normal stress responses. The mental health challenges that maritime cadet training produces carry long-term consequences, as unmanaged stress during professional preparation contributes to chronic health problems, relationship difficulties, substance use disorders, and psychological conditions that persist throughout careers and affect personal life quality decades after completing training. From an institutional perspective, maritime education programs face increasing enrollment pressures and reputation concerns in competitive educational markets; programs perceived as indifferent to student well-being struggle to attract talented cadets and experience reputational damage when cadet psychological crises receive media attention. From an industry perspective, addressing cadet well-being represents an investment in human capital sustainability; shipping companies increasingly recognize that crew well-being directly impacts operational safety, reduces costly errors, improves retention of experienced officers, and strengthens organizational culture (Fernández Otoya et al., 2024).

Furthermore, this research addresses substantial gaps in maritime education scholarship. While general education and organizational psychology literatures contain extensive evidence regarding stress management interventions and peer support effectiveness, few studies examine how these evidence-based approaches translate into maritime education contexts with their unique characteristics. Most maritime education research emphasizes competency development or regulatory compliance; comparative little research explicitly investigates how maritime institutions can integrate mental health support into professional training without compromising discipline or professional standards. Additionally, research examining maritime cadet mental health remains largely concentrated in developed maritime nations with substantial resources for psychological services; relatively limited research examines how maritime institutions in developing maritime sectors—where resource constraints are substantial and psychological service infrastructure less developed—can address cadet mental health effectively and sustainably.

In summary, this research investigates psychological resilience and mental well-being in maritime cadets as dimensions of maritime education quality and professional sustainability. By systematically examining what psychological stressors maritime cadets face, how institutional support systems can address these stressors effectively, and how maritime education can deliberately develop resilience capacities alongside technical competencies, this investigation contributes both to maritime education scholarship and to practical institutional capacity to prepare maritime professionals who sustain psychological health and professional commitment across demanding maritime careers.

2. RESEARCH METHOD

This research employed a convergent mixed-methods design integrating qualitative and quantitative data to develop comprehensive understanding of maritime cadet psychological well-being and support intervention effectiveness. The research population encompassed maritime cadets currently enrolled in deck officer programs at STIP Jakarta and four affiliated maritime training institutions (total population n=847), plus secondary populations of maritime educators, counselors, and industry human resource professionals with direct knowledge of cadet development and professional outcomes. Purposive sampling identified 42 qualitative interview participants including cadets from different academic years and program stages (n=18, selected to represent varying exposure to sea training and academic pressures), educators who directly teach and mentor cadets (n=12), institutional counselors and health services personnel (n=6), and shipping company human resource professionals (n=6). For quantitative survey components, stratified random sampling produced a sample of 287 cadets (proportionally distributed across academic years and institutions) representing 34% of the total accessible maritime cadet population and providing adequate statistical power for meaningful group comparisons.

The research instruments comprised multiple coordinated components. Primary qualitative data collection utilized a semi-structured interview guide containing 22 questions exploring psychological stressors cadets experience, protective factors supporting resilience, current support

services and their adequacy, perspectives on peer mentoring effectiveness, and recommendations for institutional improvements. Interview questions specifically prompted participants to discuss both general professional training stressors and maritime-specific demands including extended family separation, sea training intensity, hierarchical workplace cultures, and employment uncertainty. Quantitative data collection employed two instruments: (1) the Perceived Stress Scale (PSS-10), a validated 10-item instrument assessing general psychological stress perception (Cronbach's α=0.82 in this sample, indicating strong internal reliability); and (2) a custom 28-item survey assessing resilience factors, support service utilization, peer mentoring experiences, and well-being indicators, with items addressing stressor frequency, institutional support adequacy, peer support availability, and psychological well-being dimensions. Independent variables included academic year (first through fourth), exposure to sea training (no/yes), participation in peer mentoring programs (no/yes), utilization of institutional counseling services (no/yes), and demographic characteristics including gender and family proximity. Dependent variables encompassed stress perception scores, resilience scale scores, academic persistence indicators, and psychological well-being self-ratings.

Data collection proceeded across six months through structured protocols. Qualitative interviews were conducted individually at participants' institutions or via video conference, audio-recorded with explicit consent, and transcribed verbatim, producing approximately 89,000 words of interview transcript. Interviews averaged 52 minutes duration and followed the semi-structured guide while permitting flexibility for participants to elaborate on topics of particular personal significance. Field notes documenting contextual observations, apparent emotional responses to topics, and non-verbal communication patterns complemented interview transcripts. Quantitative surveys were administered both in-person at institutional settings and via online platforms, with overall response rate of 78% among sampled cadets. Temporal separation between qualitative and quantitative data collection (qualitative phase first, followed by quantitative phase informed by qualitative findings) permitted iterative refinement ensuring quantitative instruments directly assessed phenomena identified in qualitative exploration.

Data analysis proceeded through thematic analysis for qualitative data and descriptive and inferential statistical approaches for quantitative data. Qualitative analysis employed a systematic coding process whereby interview transcripts were independently reviewed by two analysts using an iterative open coding approach. Initial codes captured references to specific stressors (e.g., "academic pressure," "family separation," "employment uncertainty"), protective factors (e.g., "peer support," "instructor encouragement," "clear career pathway"), and support mechanisms (e.g., "counselor accessibility," "mentoring experience," "digital wellness tool utilization"). Codes were progressively organized into thematic categories reflecting primary stressor domains, resilience mechanisms, and support intervention types. Thematic saturation was assessed by monitoring when additional interviews ceased producing novel codes, achieved at interview 38. Cross-participant analysis examined whether themes emerged consistently across different participant types (cadets vs. educators vs. HR professionals), identifying areas of consensus regarding core issues versus domains where perspectives diverged based on professional role. Quantitative analysis included descriptive statistics characterizing the sample and variables of interest, internal reliability assessment, and inferential statistical testing. Paired t-tests examined differences in stress perception and well-being scores between groups (e.g., cadets with vs. without peer mentoring experience), while Pearson correlations assessed relationships between resilience factors and psychological well-being outcomes. Effect sizes were calculated and reported alongside statistical significance indicators to provide practical interpretation of findings.

3. RESULTS AND ANALYSIS

Primary Stressors Identified

Qualitative analysis identified six primary stress domains affecting maritime cadets, presented in Table 1 with frequency of mention across interview participants and preliminary evidence of impact severity.

Table 1: Primary Psychological Stressors Affecting Maritime Cadets

Stressor	Description	Mentioned	Described	Persistence

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Category		by (n=42)	as "High Impact" by (%)	
Family Separation During Sea Training	Extended mandatory sea training periods (typically 3-4 months) creating prolonged separation from family, limited communication access	38 (90%)	84%	Throughout training
Academic Performance Pressure	Intense pressure to maintain passing grades across theory courses combined with demands of practical skill development	41 (98%)	76%	Continuous
Sleep Deprivation	Insufficient sleep during sea training (watch rotation requirements), pre-examination periods, and practical training phases	35 (83%)	68%	Episodic/situational
Employment Uncertainty	Concern about post-graduation employment prospects, global economic impacts on shipping industry	28 (67%)	59%	Variable by economic conditions
Hierarchical Culture Stress	Difficulty adjusting to rigid hierarchical maritime workplace culture, limited space for questions or emotional expression	22 (52%)	51%	Particularly during sea training
Financial Constraints	Limited financial resources, concern about program fees and living costs during training	16 (38%)	44%	Particularly among lower-income cadets

Family separation emerged as the most universally experienced and severely impactful stressor, with 90% of participants mentioning it and 84% describing it as high-impact. Cadets particularly emphasized the psychological difficulty of extended periods without direct family contact, compounded by the hierarchical maritime culture that discourages expressions of homesickness or emotional difficulty. Academic performance pressure proved nearly universal (98% mention) reflecting the genuine rigor of maritime training and the high-stakes nature of competency development where errors can have serious safety consequences. Sleep deprivation during sea training manifested as both immediate cognitive impacts (decreased concentration, increased error risk) and longer-term health consequences. Employment uncertainty particularly affected cadets in later academic years as they approached graduation into a competitive, economically volatile industry.

Protective Factors and Existing Resilience Mechanisms

Despite these substantial stressors, most cadets successfully completed training and reported adequate psychological well-being, suggesting that resilience factors and protective mechanisms deserve systematic understanding. Table 2 presents protective factors identified through qualitative analysis.

Table 2: Resilience Factors and Protective Mechanisms Supporting Maritime Cadet Well-being

Protective Factor	Description	Mentioned by (n=42)	Associated with Improved Well-being	Primary Source
Peer Support Networks	Friendships and camaraderie among cadets facing shared experiences and challenges	40 (95%)	Strong positive correlation ($r=0.68$, $p<0.001$)	Cadets (35/40), Educators (5/40)
Instructor Recognition/Mentoring	Educators who acknowledge stress impacts and provide encouragement, guidance, and genuine concern for cadet well-being	31 (74%)	Moderate positive correlation ($r=0.52$, $p<0.05$)	Cadets (28/31), Educators (3/31)
Clear Career Pathway Communication	Clear articulation of how training translates into professional opportunities, regular discussion of career prospects	24 (57%)	Moderate positive correlation ($r=0.48$, $p<0.05$)	Cadets (19/24), HR professionals (5/24)
Physical Activity/Exercise	Regular engagement in physical fitness, sports, or outdoor activities providing stress relief and health benefits	28 (67%)	Moderate positive correlation ($r=0.54$, $p<0.05$)	Cadets (28/28)
Family/Social Support	Continued contact with family despite physical separation, supportive friend networks outside maritime program	36 (86%)	Strong positive correlation ($r=0.71$, $p<0.001$)	Cadets (36/36)
Sense of Purpose/Calling	Personal identification with maritime profession, meaningful commitment to ship operation and maritime safety	25 (60%)	Strong positive correlation ($r=0.66$, $p<0.001$)	Cadets (25/25)

Peer support networks emerged as the single most consistent resilience factor, mentioned by 95% of participants and showing strongest correlation with positive psychological outcomes (r=0.68). Cadets spontaneously described how shared experiences of training challenges created bonds enabling mutual support, problem-solving, and emotional processing. Instructor relationships and recognition of stress impacts correlated moderately with well-being but appeared particularly important during acute stress periods. Family and social support maintained importance even during extended sea training periods when direct contact was limited. Notably, sense of purpose and identification with maritime profession—the "calling" dimension—proved strongly associated with resilience despite training difficulty.

Quantitative Stress and Well-being Assessment

Survey data from 287 cadets revealed stress perception patterns and relationships between support intervention exposure and well-being outcomes. Mean Perceived Stress Scale scores (M=18.4, SD=5.2, range 0-40) indicated moderate stress perception across the sample, with meaningful variation based on demographic and program factors. Cadets currently completing sea training reported significantly higher stress (M=21.3, SD=4.8) compared to those in classroom-based phases (M=16.2, SD=5.1), $t(285)=7.34$, $p<0.001$. Fourth-year cadets approaching graduation reported elevated stress (M=20.1, SD=5.4) potentially reflecting employment anxiety.

Crucially, cadets who participated in peer mentoring programs reported significantly lower stress perception (M=15.2, SD=4.6) compared to non-participants (M=20.8, SD=5.1), $t(285)=8.92$, $p<0.001$, representing a 34% reduction in average stress scores. Similarly, cadets who had utilized institutional counseling services showed improved well-being indicators, though survey response patterns suggest counseling services remained underutilized, with only 19% of sampled cadets reporting counselor contact. Psychological well-being self-ratings (measured on a 0-10 scale where 10=excellent) showed mean rating of 6.3 (SD=2.1), with peer mentoring participants reporting significantly higher well-being (M=7.4, SD=1.8) compared to non-participants (M=5.8, SD=2.2), $t(285)=6.47$, $p<0.001$.

Peer Mentoring Program Evaluation

A pilot peer mentoring program established during the research period paired 42 second-year cadets with 21 experienced senior cadets as mentors, with structured monthly meetings plus ad-hoc contact as needed. Mentoring pairs discussed academic challenges, stress management, sea training preparation, and career planning. Post-intervention assessment revealed that mentored cadets reported lower stress (34% decrease as noted above), higher confidence in managing challenges, and increased sense of institutional belonging. Open-ended survey questions regarding mentoring experiences yielded consistent themes: cadets valued mentors who "understood what we're going through" and could "normalize stress and model how to manage it." Mentors reported personal growth and satisfaction from supporting junior cadets. Program feasibility ratings were strong (mean satisfaction 4.3/5.0), with 89% of mentored cadets indicating they would recommend the program to others.

Digital Wellness Platform Pilot

A digital wellness platform developed during the research provided mobile access to mindfulness exercises (guided by audio recordings), emotional check-in tools, peer connection features enabling cadets to communicate with peers regarding stress management strategies, and psychoeducational content about stress, sleep, and resilience. The platform was piloted with 87 volunteer cadets across three institutions over 10 weeks. Usage patterns indicated consistent engagement, with participants averaging 3.2 sessions per week. Open-ended feedback yielded positive reception: cadets appreciated that the platform was "always available" and didn't require scheduling appointments, noted particular utility of mindfulness exercises during high-stress periods, and valued the peer connection features enabling them to learn how peers managed similar challenges. Platform satisfaction rating was 4.2/5.0. However, survey data suggested utility was highest for stress prevention and coping support rather than as a substitute for formal counseling when significant psychological distress emerged. Several participants noted that while the platform helped manage ordinary stress, more significant emotional difficulties required conversation with counselors or trusted advisors.

4. DISCUSSION

The research findings address the central research question by demonstrating that maritime institutions can systematically integrate resilience-building and mental health support into professional training while maintaining academic rigor and safety standards. The identification of specific stressor domains enables institutional leaders to develop targeted interventions addressing identified challenges rather than generic well-being initiatives. The characterization of existing protective factors—particularly peer support networks and instructor relationships—provides evidence that cadets already employ resilience mechanisms deserving institutional recognition and support rather than suggesting that cadet psychological difficulties primarily reflect individual weakness or deficiency.

The robust relationship between peer mentoring participation and stress reduction aligns with extensive educational research demonstrating peer support effectiveness while extending that literature into maritime education contexts with their distinctive characteristics (Yuebo et al., 2024; Sabri et al., 2022). The 34% stress reduction among mentored cadets represents a meaningful practical effect that likely translates into improved academic engagement, persistence, and well-being outcomes. Notably, peer mentoring appears particularly valuable because mentors understand maritime-specific challenges through personal experience rather than generic training; this contextual expertise likely enhances mentors' credibility and the relevance of their guidance. The high feasibility and satisfaction ratings suggest that maritime institutions can establish sustainable peer mentoring programs without requiring extensive external resources.

The pilot digital wellness platform demonstrated feasibility within maritime education contexts and received positive reception, though with important caveats regarding its role in a comprehensive support system. The platform's strength appears to lie in making support accessible during high-stress periods when cadets might hesitate to seek formal counseling, normalizing stress management as routine self-care rather than as evidence of psychological distress, and providing peer-based support enabling cadets to learn from how peers manage similar challenges. However, survey and interview data suggest that digital platforms supplement rather than replace formal counseling services; cadets experiencing significant psychological distress appropriately sought human professional support. This finding aligns with growing digital mental health literature suggesting that technology-based interventions work optimally as components of comprehensive systems rather than as standalone solutions (Buddha et al., 2024).

The research contributes to maritime education scholarship by providing evidence regarding an understudied but increasingly important dimension of maritime professional development. While existing maritime education research emphasizes technical competency development and regulatory compliance, the current research demonstrates that psychological well-being and resilience constitute legitimate and important dimensions of maritime education quality deserving systematic institutional attention. The research also contributes to general educational literature by examining how evidence-based support interventions translate into distinctive maritime contexts with unique stressor configurations and occupational cultures.

Important limitations should be acknowledged. The study focused on Indonesian maritime contexts; while findings likely have relevance across maritime education systems generally, cultural factors and institutional structures differ internationally. Longitudinal follow-up examining whether cadets who complete training with strong resilience development maintain psychological health across early maritime careers would provide valuable perspective on long-term intervention impact. Additionally, the research engaged primarily with cadets who persisted to the point of program completion; understanding the perspectives of cadets who departed the program before completion would provide insight into whether support interventions could prevent attrition. The digital platform pilot involved volunteers with potentially greater technology comfort and mental health awareness than the broader cadet population; broader implementation would reveal whether acceptance extends across more diverse cadet populations.

The research demonstrates important practical implications for maritime institutions. Faculty development programs should equip instructors to recognize stress indicators and provide support, as educator recognition and encouragement emerged as significant resilience factors. Peer mentoring programs prove feasible and effective; maritime institutions should prioritize establishing formal

mentoring structures leveraging the peer support mechanisms cadets already employ informally. Digital wellness tools warrant broader implementation given their accessibility and positive reception, particularly during periods of intensive practical training when formal counselor contact may be logistically difficult. Importantly, addressing cadet well-being should not be framed as soft or peripheral to maritime professionalism; evidence suggests that supporting psychological health enhances rather than compromises professional competency development and maritime safety outcomes (Fernández Otoya et al., 2024). Finally, the research suggests that maritime education culture itself merits deliberate examination and evolution toward creating psychological safety—environments where cadets can acknowledge stress, seek support, and develop resilience without fear of being perceived as professionally unsuitable.

5. CONCLUSION

This mixed-methods research examined psychological stressors, protective factors, and support interventions affecting maritime cadets, identifying that while family separation and academic pressure create significant psychological demands, most cadets employ effective resilience mechanisms deserving institutional recognition and support. Peer mentoring programs and digital wellness platforms produced measurable improvements in stress perception and psychological well-being. An integrated support model combining peer mentoring, instructor recognition of mental health dimensions, accessible counseling services, curricular resilience activities, and digital tools demonstrates feasibility for maritime institutions operating within typical resource constraints. Findings contribute both to maritime education scholarship and to practical guidance for educators and institutional leaders seeking to support cadet psychological well-being as a dimension of professional development and maritime safety. Future research examining implementation at scale, long-term effects on maritime career sustainability, and comparative effectiveness of different support modalities will continue to advance understanding of how maritime institutions can prepare psychologically resilient professionals for demanding maritime careers.

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