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Building Mental Fortitude at Sea: A Randomized Controlled Psychological Intervention Study among Indian Merchant Navy Cadets

Abstract

Background: Maritime sector is the economic backbone of global trade. It is well documented that individuals of the seafaring profession face unique environmental, physical and psychosocial stressors which pose serious threats to seafarer's mental health. Despite this, compared to other domains, limited research exists on how the seafarers and in particular Indian cadets, cope with the adversities. This study designed and administered an intervention that strengthens resilience, emotion regulation, and self-efficacy and enhances quality of life (QoL) amongst the deep-sea nautical deck cadets.

Materials and methods: Thirty Merchant Navy Cadets who scored low on resilience, emotional regulation, self-efficacy, and quality of life measures were randomly assigned to the experimental group or the control group. Fifteen participants of the intervention group received the offline intervention consisting of sixteen sessions, for four weeks. Fifteen days after the intervention ended, participants were assessed again on all the variables. Measures used were Dispositional Resilience Scale-15, emotion regulation questionnaire (ERQ), Generalized Self-Efficacy Scale and WHOQOL-BREF were used to establish the baseline measure. A three-month follow-up test was also administered to determine whether initial changes were sustained over time.

Results: Repeated measures one-way ANOVA results show substantial improvements across all psychological constructs post-intervention ($p < .05$) and the improved scores were maintained at follow-up thus implying that the intervention was effective in making the cadets more resilient, learn adaptive emotion regulation strategies, have improved self-efficacy and have an overall improved quality of life.

Conclusion: Key Psychological variables were significantly improved by the intervention thus highlighting its effectiveness for the well-being of the merchant navy cadets.

Keywords: *merchant navy cadets, resilience, emotion regulation, self-efficacy, quality of life*

INTRODUCTION

Background

With the increase in international trade, expansion of global markets and intensification of economic activities, global maritime industry has seen significant growth. India is a major contributor to the global maritime workforce,

with Indian seafarers accounting for approximately 9.35% worldwide (Directorate General of Shipping, 2003). Seafaring is the profession of working aboard ships, involving navigation, engineering, and operational duties carried out at sea. The term 'deep sea shipping' refers to the transport of various goods through the maritime sector but not on short domestic sea routes but on international



routes, crossing oceans (International Labour Organization [ILO], 2006; Sampson, 2013). Deep sea shipping is embedded with unique and inimitable difficulties such as threats of piracy, criminalization of the officers, harsh weather conditions, long working hours, limited access to recreational facilities, physical and mental fatigue and so on (Sampson, 2013; Carotenuto et al., 2012). Previous literature has underscored how a high stress environment at sea causes health complications, including cardiovascular diseases, gastrointestinal disorders, and more critically, mental health concerns such as anxiety, depression, and burnout (Beşikçi et al., 2015). The mental health of seafarers requires special and sustained attention. Researchers like Mengjia et al. (2020) emphasize that the psychological characteristics of seafarers directly impact operational performance and safety outcomes. A review of seafarer's depression and suicide rates was conducted and although there seems to be some improvement, cases still persist (Mellbye and Carter, 2017). Most existing literature on seafarer mortality has not included mental health conditions, despite these being among the most pressing concerns for seafarers (Carter, 2011).

Career begins with the rank of a deck cadet, slowly progresses through ranks like 3rd officer, 2nd officer, Chief Officer and Captain. On the other hand, engine operations and technical maintenance is the responsibility of the engine department headed by Chief Engineer (International Labour Organization [ILO], 2006; Sampson, 2013). Out of all the ranks, cadets represent the most vulnerable sections, since their first experience of sailing is usually the most difficult as they experience loneliness, bad weather, and high work load among many others and the maximum dropout has been observed in cadetship. An only cadets conference was organized by the Sailors Society and cadets across the Philippines made a unanimous call – “Mental health and well-being should be the mandatory element of maritime training” (2022). Therefore, it is important to examine the characteristics that act as mechanisms in preventing stress and fatigue. Thus, through this study, an intervention has been designed and administered which strengthens resilience, emotion regulation, and self-efficacy and enhances Quality of Life amongst the merchant navy deck cadets.

Maritime Perspective and Indian Studies

Indian research has progressively explored the psychosocial and work-related difficulties faced by seafarers in the workplace. Psychological stress related to work circumstances, quality of life, and professional decisions has received scrutiny.

In a study conducted by Rengamani and Murugan in 2012, the researchers wanted to examine the occupational stress of Indian seafarers on both the deck side and the engine side. By applying the five-point scale approach, the researchers recruited 385 Indian seafarers to obtain data on the extent of the associated work-related stress related to the nature of the work. It was found that the seafarers on the deck side reported more stress compared to those working on the engine side. Nevertheless, the researchers

failed to consider the seafarers' perception of psychological resources such as resilience or quality of life.

A qualitative research study was conducted through open-ended interviews on the workplace problems among Indian sailors across various ranks by Arivazhagen (2013) and it yielded interesting insights. The most frequently cited workplace problems faced by the Indian sailors were the unavailability of internet services, the absence of adequate recreation facilities such as swimming pools or gyms, as well as the scarcity of proper entertaining options. Offering such facilities to the crew may have been limited to the officers. Nonetheless, the study failed to identify the impact on the personal resources.

Sasirekha and Ramani (2013) studied career-related perceptions of trainee mariners through a study of interviews conducted with 40 trainee mariners. The study focused on career choices and preferences as well as continuing this line of work as trainee mariners. The findings showed that trainee mariners have chosen this profession because of financial incentives and better salary and tax benefits. The study did not examine any psychological effects of these decisions and their impact on mental health and resource development.

Similarly, the study conducted by Ankita & Tripathi (2017) compared the quality of life and pattern of sleeping between 150 deck officers and another 150 engine officers. The study found that the quality of life among deck officers is much lower compared to engine officers. Although the study influenced the knowledge about the difference between the well-being of deck officers and engine officers, the study could not contribute much towards intervention methods for improving the quality of life among deck cadets or officers.

Collectively, these studies carried out in India underscore the demanding nature of maritime work and point to the need for research in the area of psychological resources as a means to promote health in maritime settings.

Overview of terminologies

‘Nautical seafarers’ refers to deck officers responsible for activities like navigation, cargo operations, and vessel maintenance.

Deck cadets who are placed under the direct supervision of the Chief Officer, have to carry out various activities like managing the safety equipment, port watch duties, operations related to cargo, painting, chipping, documentation etc. Along with it, cadets are also expected to complete their assignments, study, prepare for exams and complete project work. Given their heightened vulnerability, the present study focuses on Indian deck cadets aged 17–25 years.

Defining the variables

According to American Psychological Association (2014), resilience is “the process of adapting well in the face of adversity, trauma, tragedy, threats or even significant sources of stress”. A foundational element within resilience is hardiness (Kobasa, 1979). The APA

(2016) suggests resilience can be built through positive thinking, meditation, self-discovery, and social connection.

According to Gross (1998, 2015), emotion regulation involves processes through which individuals influence the onset, intensity, duration, and expression of emotions, making it a critical psychological resource in high-stress occupational settings such as seafaring. It is critical in seafaring due to the risk of burnout and emotional outbursts; research by Chung & Lee (2017) shows that strategies like reappraisal can effectively reduce incidents and burnout.

Another key factor is self-efficacy, which supports seafarers in managing stress, performing tasks in isolation, and contributing to industry efficiency (Choi et al., 2015). Psychologist Albert Bandura (1977) first coined the term “self-efficacy”. Bandura stated that self-efficacy refers to beliefs that a person holds for himself regarding how well he can execute a plan of action in prospective situations (Bandura, 1977).

Quality of life (QoL) has been defined by the World Health Organization as the perception individuals hold about their position in life, as influenced by cultural context, value systems, goals, expectations, and concerns. It is evaluated across four primary domains: physical health, psychological well-being, social relationships, and environmental conditions. Thus, this is a broad variable and studying it will help us in understanding the seafarers’ life with respect to multiple domains.

Significance of the study

Study conducted by United Kingdom Protection and Indemnity Club 4.4% of all deaths on board were attributable to suicide from 2014–2015, which escalated to 15.3% for the year 2015–2016 (Valankar, 2017). Hyun et al (2014) stated that seafarers are unable to alleviate their stress by themselves and hence often resort to alcohol or any other substance abuse which even leads to addiction. In alignment with the goals of Maritime Labour Convention 2006 (MLC 2006), this study aims to mitigate the psychological challenges being faced by the seafarers through an intervention. Hudson and Fraley (2015) proposed that psychological capital is malleable and can be shaped by motivation, interventions, and environmental factors. While about 50% of positivity is influenced by upbringing and 10% by factors like age and income, the remaining 40% can be developed through intentional efforts.

A recent study by Wijk et al. (2023) on 168 navy sailors found that higher dispositional resilience was linked to better emotion regulation during and after maritime operations. The authors suggest that organizational efforts to build resilience may support adaptation, and additionally supportive research evidence is required to explore how resilience and emotion regulation relate to other factors. Positive outcomes have been demonstrated by several resilience-building programs in high-stress professions. Shell’s psychosocial programme, consisting of five core modules, helped mariners recover from adversity and build resilience. The US Navy’s *Combat and*

Operational Stress Control program improved soldiers’ stress responses and addressed behavioural issues. An 8-week MMFT course for U.S. Marines also led to greater mindfulness and reduced stress (Johnson et al., 2014).

However, a major research gap exists: there is limited and fragmented research on Indian seafarers’ mental health and no study has examined resilience, emotion regulation, self-efficacy, and quality of life together in this population. A comprehensive intervention program targeting this combination of variables has not yet been made or administered, thus highlighting the novelty of this intervention. This intervention can prove to be of immense utility in the pre-sea training programs. Moreover, since seafaring falls under “isolated confined environments” (ICE), the intervention may also benefit other ICE professions (e.g., polar expeditions, space missions). The findings of this study have practical implications for the development of scalable, computer-based training programs and policy formulation. In addition, future research can further evaluate these interventions across broader maritime contexts.

Theoretical Framework

According to Hobfoll’s Conservation of Resources (COR) theory, individuals are motivated to obtain, retain, and protect resources to maintain well-being and social connectedness. When resources are lost or threatened, stress increases, potentially leading to burnout, poor mental health, and reduced job performance. Therefore, interventions designed for merchant navy personnel should aim to help them conserve existing resources and facilitate the renewal and replenishment of depleted ones.

Along with COR theory, this study also is grounded in established psychological theories which help in understanding how individuals who are a part of highly stressful professions like seafaring, adapt to the chronic stress and fatigue. Emotion regulation theory, proposed by James J. Gross (1998, 2015), suggests that people actively influence their emotions, when they feel them, and how they express them. Effective emotion regulation strategies, like cognitive reappraisal, can reduce psychological distress and improve resilience, especially in high-stress situations. In maritime training, good emotion regulation is essential for coping with long periods of isolation, job demands, and exposure to risk.

Social cognitive theory, particularly the idea of self-efficacy from Albert Bandura (1997), further informs this framework. Self-efficacy is the belief in one’s ability to organize and carry out actions needed to handle difficult situations. Higher self-efficacy increases motivation and persistence, promotes adaptive coping, and strengthens resilience. This helps deck cadets adjust better to the stress they face. Moreover, the stress and coping model from Richard Lazarus and Susan Folkman (1984) helps explain how people assess stressors and use coping strategies. According to this model, psychological outcomes depend on how we evaluate stress and the resources available for coping, including emotional regulation skills and perceived self-efficacy. These aspects are very relevant for

seafarers, who work in environments filled with physical, psychological, and social stressors. Using these theoretical ideas, the current intervention aims to improve adaptive emotion regulation and self-efficacy. This will help build resilience and enhance the overall quality of life for Indian merchant navy deck cadets. The framework assumes that by strengthening these psychological skills, cadets will better handle job stress and maintain their mental well-being during maritime training and service.

Hypotheses

Based on Hobfoll's (1989) Conservation of Resources theory, emotion regulation theory, social cognitive theory and prior empirical research, the following hypotheses were proposed:

H1: Cadets who receive the psychological intervention would demonstrate significantly greater improvements in resilience from pre-test to post-test and follow-up compared to the control group.

H2a: Cadets in the intervention group would report significantly higher use of cognitive reappraisal as an emotion regulation strategy at post-test and follow-up compared to the control group.

H2b: Cadets in the intervention group would report significantly lower levels of expressive suppression as an emotion regulation strategy at post-test and follow-up compared to the control group.

H3: Cadets who undergo the intervention would report significantly higher self-efficacy scores post-intervention and at follow-up compared to the control group.

H4a: Cadets in the intervention group would show significantly greater improvement in the physical health domain of QoL at post-test and follow-up in comparison to the other group (control).

H4b: Intervention group participants would show significantly greater improvement in the psychological health domain of QoL at post-test and follow-up compared to the control group.

H4c: Intervention group cadets would show significantly greater improvement in the social domain of quality of life at post-test and follow-up compared to the control group.

H4d: Cadets in the intervention group would show significantly greater improvement in the environmental domain of quality of life at post-test and follow-up compared to the control group.

METHOD

Research Design and Participants

This design is a two-arm randomized experimental research design – pre-test/post-test design, approved by Christ University of Delhi, India. A total of 122 Indian merchant navy deck cadets were initially recruited through convenience sampling to form the screening and baseline assessment pool and were contacted in a merchant navy training institute situated in Delhi, India. This sample size was determined by feasibility considerations, including institutional access, training batch size, and participant

availability during the data collection period. From the initial pool, 30 participants who met the inclusion criteria and provided consent for longitudinal participation were randomly selected for the intervention study. The smaller intervention sample was chosen due to practical constraints, including the intensive nature of the psychological intervention, session-based delivery, and scheduling limitations within the maritime training context. Such sample sizes are consistent with controlled pilot intervention studies conducted in occupational and training settings.

The 30 participants were randomly divided into either intervention or control group. Following the intervention (designed on all the four variables-resilience, emotion regulation, self-efficacy and quality of life) which went on for a month, participants of both the groups were reassessed on all the measures. Finally, a 3-month follow-up was also carried out to determine if the intervention had lasting effects.

Inclusion and Exclusion criteria

Inclusion: All Indian Merchant Navy deep-sea nautical deck cadets aged 17–25 years who had spent at least six months at sea and voluntarily consented to participate in the one-month intervention study were included. The mean age of participants in the intervention group was 18.13 years ($SD = 0.35$), while the control group had a mean age of 18.20 years ($SD = 0.41$).

Exclusion: The deck cadets who have left the profession, on medical leave, pursuing any other course alongside, or and those identified with psychiatric conditions were excluded from the sample.

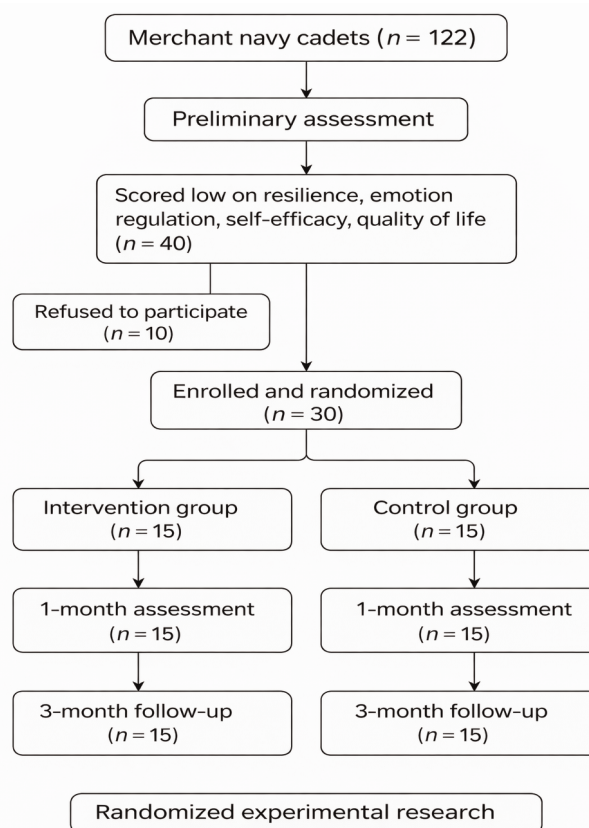


Fig 1. Study consort diagram

Measures

Socio demographic information

Details concerning age, duration of sea time, type of vessel served (oil, gas, chemical, bulk carrier, Ro-Ro, other) were documented.

Dispositional Resilience Scale-15 (DRS-15)

To assess resilience of the Indian merchant navy deep sea nautical deck cadets, Dispositional Resilience Scale-15 (DRS-15) (Bartone 2007) was used. The scale consists of 15 items, negatively and positively worded, covering three components of hardiness: commitment, control and challenge. An alpha coefficient of 0.83 was reported for the overall hardiness measure and for the facets, 0.77 (commitment), 0.71 (control) and 0.70 (challenge).

Emotion regulation questionnaire (ERQ)

ERQ – a 10-item, 7-point Likert type Scale was used to assess emotion regulation (Gross & John, 2003). This scale identifies respondent's tendency to regulate their emotions. The ERQ is a self-report questionnaire designed to investigate how frequently individuals use any of two major emotion regulation strategies: cognitive reappraisal (6 items) – changing the way one thinks about a situation to alter its emotional impact and expressive suppression (4 items) – inhibiting the external expression of emotions. Alpha coefficient for reappraisal is 0.73 and suppression is 0.64.

Generalized Self-Efficacy Scale

To assess self-efficacy, the Generalized Self-Efficacy Scale (4-point Likert-type scale) was used (Schwarzer and Jerusalem, 1995). It consists of 10 items aimed to measure the optimistic self-beliefs of individuals 12 years of age or older to battle life's difficulties. The response options are presented along for each item. Research studies have reported Cronbach's alphas ranging between 0.76 and 0.90.

WHOQOL-BREF

To assess quality of life, WHOQOL-BREF which consists of 26 questions spread over four domains (Skevington et al., 2004). Out of 26 items, 2 general items on overall QoL and general health and the rest 24 items were spread over the 4 domains. 0.896 is the reported alpha coefficient.

Procedure

Phase I- Pre- Intervention

At the foremost, ethical approval was obtained from the Institutional Review Board of the University. Based on an extensive review of literature on all variables and existing interventions and after identification of the research gaps, the present intervention was conceptualised which was then sent for expert validation. After incorporating experts' suggestions and finalising the intervention, pilot study was conducted (the entire intervention was administered for one month) with five cadets to understand the usefulness, feasibility and shortcomings of the intervention, if any.

Phase II- Data Collection and Intervention (Intervention Framework and Cultural Adaptation)

Permission was taken from a Merchant Navy Training Institute in Delhi for data collection. Cadets who were undergoing training at this institute, after their first contract at sea, were contacted towards the conclusion of one of their lectures. After explaining them the aim and purpose of the research study, participants who volunteered were requested to read and sign the informed consent forms. For screening, Dispositional Resilience Scale-15, Emotion Regulation Questionnaire (ERQ), Generalized Self-Efficacy Scale and WHOQOL-BREF were administered to the willing 122 cadets. 40 participants who exhibited moderate to low scores on all the variables were shortlisted for the study. However, 10 out of the 40 participants were unwilling to participate and hence using lottery system, the remaining 30 participants were assigned randomly to either the intervention group or the control group. 15 cadets from the intervention group received sixteen sessions of Psychological intervention for a duration of 4 weeks from the first author who is trained in Counselling Psychology.

The intervention was based on emotion regulation theory (James J. Gross, 1998, 2015) and social cognitive theory (Albert Bandura, 1997). It aimed to improve coping skills, resilience, and self-efficacy. The content specifically addressed occupational stressors common in maritime training, such as long periods of isolation, hierarchical authority, and performance pressure. To make it culturally relevant, the intervention used examples, language, and scenarios from the Indian maritime training context. It emphasized collectivistic values, respect for authority, and familiar stress-management techniques. This approach connected the intervention to the sociocultural background of Indian merchant navy cadets.

Module I was named 'Facing Adversity' – Introducing Resilience (Week 1) focused on enhancing resilience through four structured exercises rooted in Positive Psychology. The first, *Focusing on Breath and Thoughts*, introduced mindfulness practices to improve present-moment awareness, supported by Denkova et al. (2020). He also suggested that resilience can be developed and that mindfulness training has yielded better outcomes than relaxation training in building resilience. Moreover, participants who underwent mindfulness training were more likely to continue practicing independently. The second, *Self-Compassion Activity*, encouraged participants to respond to personal challenges with the same kindness they would offer a friend. Trompetter et al. (2017) suggested that self-compassion enhances resilience and protects against psychopathology. The third, *Best Possible Self*, involved visualizing an optimistic future across personal domains. Pietrowsky et al. (2012), used this exercise and it helped in boosting optimism, goal clarity, and resilience. The final activity, *The Upside of Stress*, invited participants to reframe past adversities as sources of strength and inspiration. McGonigal (2016) emphasizes that viewing stress positively can help individuals harness their strengths to face challenges and build resilience.

Module II was all about teaching emotion regulation skills to the seafarers through various psychoeducational and experiential exercises. The initial activity, *Emotional Literacy*, familiarized participants with the fundamentals and various theoretical perspectives on emotions with special emphasis on life aboard. In a study by Hall et al (2021), seventy-nine young people were enrolled to the 12-week intervention program where along with other activities, participants were explained about emotion and related topics. Analyses revealed significant improvement in the primary outcome of emotion dysregulation with a moderate effect size in addition to reduced depression, anxiety, stress and experiential avoidance. In the second activity, *Expressive Writing*, individuals were prompted to explore and document distressing or fearful experiences. Pennebaker et al. (1988), in their seminal work *Opening Up: The Healing Power of Expressing Emotion*, demonstrated that individuals who relived their traumatic experiences by writing them down over four days experienced improved emotional regulation, more positive moods, and fewer health issues compared to those who wrote about routine daily events. The third activity, *Thank You Stories*, encouraged participants to revisit and share past experiences that evoked gratitude. Study by Boggio et al (2019) reported that participants of the study who documented about gratitude in their writings were better equipped at using reappraisal than control group. The final task, *Third-Person Self-Talk*, involved practicing internal dialogue using third-person references. Kross and Moser (2017) conducted a neuroscience-based study using EEG and they discovered that using third-person self-talk rapidly reduces emotional distress without engaging cognitive control, making it an effortless emotion regulation strategy.

Furthermore, module III focussed on enhancing self-efficacy through various structured exercises. The first exercise, *Count Your Strengths*, involved participants reflecting on their personal strengths and sharing real-life success stories of overcoming adversity. This activity aimed to build self-efficacy through mastery experiences, as suggested by Bandura. Huffman et al. (2013) reported that among nine positive psychology interventions for suicidal patients, gratitude and strength-counting exercises were most effective in enhancing protective factors. The second exercise, *VE-Strength Spotting* (based on Bandura's 'vicarious learning' source of self-efficacy) encouraged participants to identify and reflect on the strengths of someone they admire. Kashdan et al. (2018) found that couples who effectively identified and reflected on each other's strengths showed greater appreciation and also enhanced self-efficacy. The third exercise employed *Verbal Persuasion*, wherein participants received individual encouragement and constructive feedback which was employed to foster coping with adversity. Siegle (2007) found that students' math self-efficacy significantly improved when teachers, after receiving self-efficacy training, used encouraging statements like "You can do it" and "I trust you." The final activity, *Guided Meditation* using Jacobson's progressive muscle relaxation, targeted

physiological arousal by helping participants manage stress through muscle tension awareness and relaxation. Akbari et al. (2022) found that patients suffering from multiple sclerosis disease and those who received Jacobson's Progressive Muscle Relaxation (JPMR) showed significant improvements in self-esteem and self-efficacy, suggesting its value as a complementary therapeutic technique.

Moreover, module IV aimed at enhancing quality of life through four practical exercises. The first exercise, *Humour and Laughter*, introduced participants to the therapeutic value of humour through jokes, stories, and a brief lecture on humour research. Tse et al. (2010) found that geriatric population experiencing pain who received humour therapy reported significantly higher Quality of Life compared to those in the control group. The second exercise, *Adaptive Self-Regulation of Unattainable Goals*, encouraged participants to reflect on goals they had failed to achieve and to reframe or replace them with new, meaningful alternatives. Wrosch et al. (2003) found that across diverse participant groups, the ability to disengage from unattainable goals and reengage with new ones was associated with improved Quality of Life. The third exercise, *Diaphragmatic Breathing*, taught participants a structured breathing technique to counter the physiological effects of stress. Lenart et al. (2020) reviewed seven studies and found that breathing exercises are positively associated with improved lung function and enhanced quality of life in adults. The last exercise in this module is, *Expressing Gratitude*, which involved writing about five things participants were grateful for, fostering positive reflection and emotional connection. Anand et al. (2021), in their study, found that gratitude is significantly associated with improved Quality of Life.

In addition, feedback was taken from the participants to gather information about their experiences, perspectives regarding the overall intervention (clarity, utility, delivery, relevance of content etc.). A learning booklet was created based on this intervention which consisted of all the four modules. It provided all the necessary information related to the various exercises within the modules, the theoretical frameworks, basic definitions, relevance and importance and so on. The purpose of creating this manual was to provide a reference to the participants during the intervention period and also later to support them when they go on board and return to their regular seafaring duties.

Post Intervention

One-month assessment was conducted for both groups, wherein the same questionnaires of all the variables were administered, followed by a three-month follow-up to evaluate the maintenance of the effects of the intervention and its sustainability.

Hypotheses

Statistical Analyses

Repeated measures ANOVA and independent samples t-tests were carried out to analyse the data. In addition, for all the key effects, confidence intervals were reported

in order to provide more clarity and to increase the precision of the statistical estimates.

Because of a modest sample size ($N=30$), a sensitivity power analysis was carried out to find out the least effect sizes that can be detected with the given sample size of 30 in a reliable manner. With $N = 30$, $\alpha = .05$, and 80% power, the study was sensitive only to correlations of at least $r = .48$ (two-tailed). For between-group comparisons ($n = 15$ per group), the minimum detectable effect size was **Cohen's $d = 1.06$** . Effect sizes smaller than these thresholds may not have been detected reliably.

RESULTS

Demographic Details of the Participants

Table 1 shows the demographic characteristics of the participants. Chi-square tests were conducted to assess group differences in age which revealed that participants are well matched in both the groups ($P > 0.05$).

Out of the 122 participants who were administered the measures for establishing baseline, 24.6% participants ($N=30$) scoring in the moderate to low on the variables-Resilience, Emotion Regulation, Self-Efficacy and Quality of Life, thus became a part of the intervention study. Both the groups were screened for all the four variables preceding the intervention and results from independent samples t -tests indicated that the two groups did not differ significantly. (see table 2).

Effect on Cadet's Resilience

Preliminary assumption checks indicated no violation of homogeneity of variance (Levene's tests: all $ps > .05$). The assumption of sphericity was also met for the within-

Table 1 . Demographic characteristics of the participants

Variable	Intervention Group (n = 15)	Control Group (n = 15)	χ^2 (df)	p
Age				
18 years	13	12		
19 years	2	3	0.22 (1)	.64
Type of Vessel Served				
Chemical Tanker	8	10		
Oil Tanker	2	0		
Bulk Carrier	5	5	1.88 (2)	.39

Note. All participants were male. Vessel types are based on self-reported service experience.

subjects factor of time (Mauchly's test: $\chi^2(2) = 0.714$, $p = .700$), supporting the use of repeated measures ANOVA. Descriptive statistics indicated that the experimental group's resilience scores increased from Pre-test ($M = 23.86$, $SD = 3.31$, 95% CI [22.03, 25.70]) to Post-test ($M = 31.40$, 95% CI [29.70, 33.10]) and were maintained at follow-up ($M = 31.30$). On the other hand, throughout the three assessment periods, no significant changes were observed in the control group's scores (Pre-test $M = 22.20$, 95% CI [20.26, 24.14], Post-test $M = 22.00$, $SD = 3.07$, 95% CI [20.26, 24.14], follow-up $M = 22.20$, 95% CI [20.26, 24.14]) (see Table 3).

The effect of the intervention on resilience was analysed using repeated measures ANOVA (2 *3 Factorial design: (Group: Experimental, Control) $\times$ (Time: Pre-test,

Table 2. Baseline Comparison of Psychological Variables Between Intervention and Control Groups

Variable	Group	M	SD	t (df)	p
Resilience	Intervention	23.87	3.31	-1.337 (28)	0.192
	Control	22.20	3.51		
Cognitive Reappraisal	Intervention	23.07	4.76	-0.526 (28)	0.603
	Control	22.13	4.96		
Expressive Suppression	Intervention	19.53	3.54	1.509 (28)	0.142
	Control	21.40	3.22		
Self-Efficacy	Intervention	21.73	4.91	-0.834 (28)	0.411
	Control	20.27	4.73		
Physical Health	Intervention	18.20	5.94	0.025 (28)	0.980
	Control	18.27	8.24		
Psychological Health	Intervention	16.73	8.43	3.778 (28)	0.001
	Control	34.60	16.26		
Social Relationships	Intervention	31.27	19.83	2.358 (28)	0.026
	Control	47.93	18.87		
Environmental Health	Intervention	35.87	15.74	2.439 (28)	0.021
	Control	49.67	15.25		

Note. Independent samples t -tests were conducted to assess group differences at baseline.

RESILIENCE

Table 3. Descriptive Statistics: Mean Resilience Scores by Group

Time Point	Experimental	Control	Total
Pre-test	23.86	22.20	23.03
Post-test	31.40	22.00	26.80
Follow-up	31.30	22.20	26.76

Post-test, Follow-up). $F(2, 56) = 16.07, p < .001$, partial $\eta^2 = .365$ – which shows the main effect of time, indicating that the resilience scores changed over time. The interaction effect of time and group shows statistical significance, i.e. $F(2, 56) = 16.07, p < .001$, partial $\eta^2 = .365$, suggesting differential patterns of change between groups (see table 4).

Table 4. Repeated Measures ANOVA Results for Resilience

Source	F	df	p	η^2_p
Time	16.07	(2, 56)	< .001	.365
Time $\times$ Group	16.07	(2, 56)	.014	.365
Group (Between)	64.86	(1, 28)	< .001	.698

Note. η^2_p = partial eta squared. Significant effects are bolded if needed in visual presentation but not required in APA tabular text unless specified by the journal.

Post hoc analysis with Bonferroni adjustment showed notable increases beginning from pre-test to post-test ($p < .001$) and from pre-test to follow-up ($p < .001$), with no significant difference between post-test and follow-up ($p = .965$), indicating sustained gains (table 5).

Table 5. Pairwise Comparisons of Resilience Scores Across Time Points (Bonferroni Adjusted)

Comparison	Mean Diff	SE	p	95% CI
Pretest – Posttest	-3.77	0.82	.000	[-5.45, -2.08]
Pretest – Follow-up	-3.73	0.72	.000	[-5.21, -2.26]
Posttest – Follow-up	0.03	0.74	.965	[-1.49, 1.56]

Note. Bonferroni correction was applied. Confidence intervals are based on adjusted means.

Between-subjects analysis revealed a significant Group effect, $F(1, 28) = 64.86, p < .001$, partial $\eta^2 = .698$, with the participants of the intervention group showing higher resilience overall. Multivariate analysis confirmed these effects, Wilks' $\Lambda = .473, F(2, 27) = 15.05, p < .001$, partial $\eta^2 = .527$.

Effect on Cadet's Emotion Regulation

Effect on Cognitive Reappraisal

An upward trend in scores was observed in both groups between the pre- and post-test, with the experimental group demonstrating a comparatively larger gain

(Pre-test $M = 23.20, SD = 12.66, 95\% CI [16.19, 30.21]$, Post-test $M = 31.60, SD = 4.61, 95\% CI [29.04, 34.16]$, Follow-up $M = 30.20, SD = 5.11, 95\% CI [27.36, 33.04]$) (see table 6). Greenhouse-Geisser correction was applied and repeated measure ANOVA revealed, a significant main effect of time was found - $F(1.28, 22.98) = 18.37, p < .001, \eta^2_p = .505$. (Table 7). However, the time $\times$ Group interaction was not statistically significant. Analysis of the pairwise comparisons demonstrated that there has been an increase from pre-test to post-test ($p < .001$) and from pre-test to follow-up ($p = .001$) but a decrease from post-test to follow up ($p = .047$) thus hinting towards a plateau effect.

Table 6. Means and Standard Deviations of Cognitive Reappraisal Scores Across Time by Group

Time Point	Group	M	SD	N
Pre-test	CONTROL	22.93	4.93	15
	EXP	31.60	1.67	5
Post-test	CONTROL	27.07	4.25	15
	EXP	30.20	1.79	5
Follow-up	CONTROL	26.07	4.11	15
	EXP			

Note. EXP = experimental group; CONTROL = control group. Scores are based on the cognitive reappraisal subscale of the Emotion Regulation Questionnaire.

Table 7. Repeated Measures ANOVA Results for Cognitive Reappraisal

Source	df	F	p	Partial η^2
Time	1.28, 22.98	18.37	< .001	.505
Time $\times$ Group	1.28, 22.98	2.30	.138	.113

Note. Greenhouse-Geisser correction applied. Partial η^2 = partial eta squared.

Effect on Expressive Suppression

A reduction in mean scores was observed across the pre-test, post-test, and follow-up, as shown in (see table 8). Experimental group means decreased from pre-test ($M = 19.53, SD = 3.44, 95\% CI [17.62, 21.44]$) to post-test ($M = 9.67, SD = 4.10, 95\% CI [7.39, 11.95]$) and were maintained at follow-up ($M = 8.47, SD = 3.16, 95\% CI [6.72, 10.22]$). Control group scores remained relatively stable across time points (pre-test: $M = 21.40, SD = 3.14$; post-test: $M = 20.13, SD = 2.90$; follow-up: $M = 20.40, SD = 2.25$). After applying Greenhouse-Geisser correction, within-subjects ANOVA was computed and both Time $\times$ Group interaction and F values were found to be significant at $F(1.30, 36.51) = 38.62, p < .001, \eta^2_p = .580$. Also, between-subjects analysis showed the experimental group having lower expressive suppression scores post-intervention (see table 9). Post hoc pairwise analyses revealed significant decreases from Pre-test to Post-test ($p < .001$) and Pre-test to follow-up ($p < .001$), with no significant change between Post-test and follow-up ($p = .159$), suggesting the intervention effects were sustained (see table 10).

Table 8. Means and Standard Deviations of Expressive Suppression Scores Across Time by Group

Time Point	Group	M	SD	N
Pretest	EXP	19.53	3.54	15
	CONTROL	21.40	3.22	15
Posttest	EXP	9.67	4.29	15
	CONTROL	20.13	3.07	15
Follow-up	EXP	8.47	3.42	15
	CONTROL	20.40	2.26	15

Note. EXP = experimental group; CONTROL = control group. Scores are based on the expressive suppression subscale of the Emotion Regulation Questionnaire.

Table 9. Repeated Measures ANOVA Results for Expressive Suppression

Source	df	F	p	Partial η^2
Time	1.30, 36.51	58.85	< .001	.678
Time $\times$ Group	1.30, 36.51	38.62	< .001	.580
Group (Between)	1, 28	66.05	< .001	.702

Table 10. Pairwise Comparisons for Expressive Suppression

Comparison	Mean Difference	SE	p	95% CI
Pre-test – Post-test	5.57	0.71	<.001	[4.11, 7.02]
Pre-test – Follow-up	6.03	0.74	<.001	[4.53, 7.54]
Post-test – Follow-up	-0.47	0.32	.159	[-1.13, 0.19]

Effect on Self-Efficacy

The experimental group showed a marked increase from pre-test ($M = 21.73$, $SD = 4.76$, 95% CI [19.10, 24.36]) to post-test ($M = 30.20$, $SD = 2.05$, 95% CI [29.06, 31.34]), with gains maintained at follow-up ($M = 29.27$, $SD = 2.01$, 95% CI [28.16, 30.38]). In contrast, the control group demonstrated minimal change across time points (pre-test: $M = 20.27$, $SD = 4.22$; post-test: $SD = 2.59$; follow-up: $SD = 2.59$). In contrast, the control group showed no meaningful change across the three time points, maintaining an average score of 20.27 (Pre-test 95% CI [17.93, 22.61], Post-test 95% CI [18.84, 21.70], Follow-up 95% CI [18.84, 21.70]) (see Table 11). Levene's test confirmed the assumption that variances are consistent across conditions at all time points: Pre-test $p = .878$, Post-test $p = .096$, Follow-up $p = .085$.

Mauchly's test of sphericity was violated, $W = .242$, $\chi^2(2) = 38.315$, $p < .001$. Thus, Greenhouse-Geisser correction was applied. As can be seen in table 12, a repeated measures ANOVA with Greenhouse-Geisser correction revealed a significant main effect of time, $F(1.14, 31.85) = 18.72$, $p < .001$, $\eta_p^2 = .401$, and a significant time $\times$ group interaction, $F(1.14, 31.85) = 18.72$, $p < .001$, $\eta_p^2 = .401$. A between-subjects analysis showed a significant group effect,

SELF-EFFICACY

Table 11. Descriptive Statistics for Self-Efficacy by Group

Time Point	Group	M	SD	N
Pre-test	Experimental	21.73	4.91	15
	Control	20.27	4.73	15
Post-test	Experimental	30.20	2.18	15
	Control	20.27	3.31	15
Follow-up	Experimental	29.27	2.09	15
	Control	20.27	3.31	15

Note. M = mean; SD = standard deviation.

SELF EFFICACY

Table 12. Repeated Measures ANOVA (Greenhouse-Geisser)

Source	F	df	p	η_p^2
Time	18.72	1.14	<.001	.401
Time $\times$ Group	18.72	1.14	<.001	.401
Group (Between)	48.58	1	<.001	.634

Note. Results are based on Repeated Measures ANOVA using the Greenhouse-Geisser correction. η_p^2 = partial eta squared.

$F(1, 28) = 48.58$, $p < .001$, $\eta_p^2 = .634$. Self-efficacy scores significantly increased from Pre-test to Post-test ($p < .001$) and from Pre-test to Follow-up ($p < .001$). The difference between Post-test and Follow-up was not significant ($p = .099$). Thus, the sustained impact of the intervention was evident over time.

Quality of Life

Descriptive statistics show that the intervention group's mean scores improved in all domains – physical health, psychological health, self-efficacy and quality of life – from pre-test to post-test compared to control groups, except in some cases where the control group's scores might have slightly increased due to factors which are beyond control or even natural progression. Intervention effects were sustained as the intervention group maintained the scores at follow-up. It is important to note that while the groups were comparable at baseline on Physical Health, significant baseline differences were present in the Psychological Health, Social Health, and Environmental Health domains, with the control group scoring higher on these dimensions prior to the intervention. In case of control group, scores increased in environmental health which might be due to delayed effects or other environmental factors (see table 13).

Effect on Cadet's Physical Health

statistically significant effect of time was observed, Greenhouse-Geisser corrected, $F(1.62, 45.47) = 13.06$, $p < .001$, indicating that physical health scores changed across the three time points. A significant time $\times$ group interaction was also found, Greenhouse-Geisser corrected,

Table 13. Means and Standard Deviations of Quality of Life Domains Across Time and Groups

Domain	Time Point	Group	Mean	SD	N
Psychological Health	Pretest	Control	18.27	8.24	15
		Experimental	31.73	11.40	15
	Follow-up	Control	22.27	8.92	15
		Experimental	30.13	11.32	15
	Posttest	Control	22.27	8.92	15
		Experimental	16.73	8.43	15
	Follow-up	Control	17.13	8.38	15
		Experimental	70.07	17.84	15
	Posttest	Control	18.47	10.84	15
		Experimental	67.40	13.65	15
Social Health	Pretest	Control	17.67	8.98	15
		Experimental	31.27	19.83	15
	Follow-up	Control	36.67	17.51	15
		Experimental	59.60	14.74	15
	Posttest	Control	33.00	19.68	15
		Experimental	59.20	12.65	15
	Follow-up	Control	34.67	16.61	15
		Experimental	35.87	15.74	15
	Posttest	Control	31.80	13.34	15
		Experimental	73.07	7.20	15
Environmental Health	Pretest	Control	34.80	14.21	15
		Experimental	71.87	7.28	15
	Follow-up	Control	71.87	7.28	15
		Experimental	71.87	7.28	15
	Posttest	Control	71.87	7.28	15
		Experimental	71.87	7.28	15
	Follow-up	Control	71.87	7.28	15
		Experimental	71.87	7.28	15
	Posttest	Control	71.87	7.28	15
		Experimental	71.87	7.28	15

Note. Scores are domain-wise means on the WHOQOL-BREF scale, higher scores indicate better quality of life.

$F(1.62, 45.47) = 3.62, p = .043$, suggesting that the rate of improvement differed between groups. Additionally, the between-groups effect was significant, $F(1, 28) = 4.90, p = .035$, with the intervention group demonstrating greater gains (see table 14).

The experimental group demonstrated a substantial increase from pre-test ($M = 18.20, SD = 5.68, 95\% CI [15.05, 21.35]$) to post-test ($M = 31.73, SD = 10.91, 95\% CI [25.69, 37.77]$), with gains largely maintained at

follow-up ($M = 30.13, SD = 10.76, 95\% CI [24.17, 36.09]$). In contrast, the control group showed only modest changes across time points, with scores remaining relatively stable from pre-test ($M = 18.27, SD = 6.34, 95\% CI [14.76, 21.78]$) to post-test ($M = 22.27, SD = 8.27, 95\% CI [17.69, 26.85]$) and follow-up ($M = 22.27, SD = 8.27, 95\% CI [17.69, 26.85]$).

Effects on Psychological Health

Mauchly's test of sphericity indicated that the assumption of sphericity was met for psychological well-being ($p > .05$); therefore, uncorrected degrees of freedom are reported. The analysis revealed a strong main effect of time on psychological well-being, $F(2, 56) = 118.30, p < .001, \eta_p^2 = .809$. A significant time $\times$ group interaction was also observed, $F(2, 56) = 109.86, p < .001, \eta_p^2 = .797$, indicating that the experimental group demonstrated substantially greater improvement than the control group. Importantly, these gains were maintained at follow-up (see table 15).

Table 14. Repeated Measures ANOVA for Physical Health Domain

Source	df (corrected)	F	p	Partial η^2
Time	1.62, 45.47	13.06	< .001	.318
Time $\times$ Group	1.62, 45.47	3.62	.043	.115
Between-Groups	1, 28	4.90	.035	.149

Note. Greenhouse-Geisser correction applied. Partial η^2 = partial eta squared.

Table 15. Repeated Measures ANOVA for Psychological Health Domain

Source	df	F	p	Partial η^2
Time	2, 56	118.30	< .001	.809
Time $\times$ Group	2, 56	109.86	< .001	.797
Between-Groups	1, 28	—	—	—

Note. Greenhouse-Geisser correction applied. Partial η^2 = partial eta squared.

(Experimental group) Pre-test M = 16.73, SD = 8.45, 95% CI [12.05, 21.41], Post-test M = 70.07, SD = 17.84, 95% CI [60.19, 79.95], Follow-up M = 67.40, SD = 13.63, 95% CI [59.84, 74.96]

(Control group) Pre-test M = 17.13, SD = 8.49, 95% CI [12.44, 21.82], Post-test M = 18.47, SD = 10.84, 95% CI [12.47, 24.47], Follow-up M = 17.67, SD = 8.99, 95% CI [12.70, 22.64]

Effects on Social Health

Mauchly's test of sphericity indicated that the assumption of sphericity was violated for social health ($p < .05$); therefore, Greenhouse–Geisser corrections were applied to the degrees of freedom. A statistically significant main effect of time on social health was observed, $F(1.60, 44.83) = 6.26$, $p = .007$, indicating changes in social health scores across the three time points. A significant time $\times$ group interaction was also found, $F(1.60, 44.83) = 9.39$, $p = .001$, suggesting that improvement trajectories differed between the experimental and control groups. Additionally, the between-groups comparison was significant, $F(1, 28) = 14.61$, $p = .001$, confirming greater improvements in the intervention group (see Table 16).

Table 16. Repeated Measures ANOVA for Social Health Domain

Source	df (corrected)	F	p	Partial η^2
Time	1.60, 44.83	6.26	.007	.183
Time $\times$ Group	1.60, 44.83	9.39	.001	.251
Between-Groups	1, 28	14.61	.001	.343

Note. Greenhouse-Geisser correction applied. Partial η^2 = partial eta squared.

(Experimental group) Pre-test M = 31.27, SD = 19.82, 95% CI [20.29, 42.25], Post-test M = 59.60, SD = 14.73, 95% CI [51.44, 67.76], Follow-up M = 59.20, SD = 12.63, 95% CI [52.20, 66.20]

(Control group) Pre-test M = 36.67, SD = 17.52, 95% CI [26.97, 46.37], Post-test M = 33.00, SD = 19.68, 95% CI [22.10, 43.90], Follow-up M = 34.67, SD = 16.61, 95% CI [25.47, 43.87]

Environmental Health

Mauchly's test of sphericity indicated that the assumption of sphericity was violated for environmental quality of life ($p < .05$); therefore, Greenhouse–Geisser

corrections were applied to adjust the degrees of freedom. A statistically significant main effect of time on environmental quality of life was observed, $F(1.92, 53.80) = 174.76$, $p < .001$, indicating significant changes across the three time points. A substantial time $\times$ group interaction was also found, $F(1.92, 53.80) = 53.31$, $p < .001$, suggesting that cadets who underwent the intervention benefited more than those in the control group. Consistent with this pattern, the between-groups comparison was significant, $F(1, 28) = 16.69$, $p < .001$ (see Table 17).

Table 17. Repeated Measures ANOVA for Environmental Health Domain

Source	df (corrected)	F	p	Partial η^2
Time	1.92, 53.80	174.76	< .001	.862
Time $\times$ Group	1.92, 53.80	53.31	< .001	.656
Between-Groups	1, 28	16.69	< .001	.373

Note. Greenhouse-Geisser correction applied. Partial η^2 = partial eta squared.

(Experimental group) Pre-test M = 35.87, SD = 15.74, 95% CI [27.15, 44.59], Post-test M = 73.07, SD = 7.20, 95% CI [69.08, 77.06], Follow-up M = 71.87, SD = 7.27, 95% CI [67.84, 75.90]

(Control group) Pre-test M = 31.80, SD = 13.28, 95% CI [24.41, 39.19], Post-test M = 34.80, SD = 14.16, 95% CI [26.93, 42.67], Follow-up M = 71.87, 95% CI [67.84, 75.90]

DISCUSSION

Through this randomized two-arm study, a structured intervention aiming to enhance resilience, emotion regulation, self-efficacy and quality of life of Indian merchant navy cadets was administered. Cadets have to go through hurdles like strict hierarchical chain of commands, social isolation, anxiety regarding future postings and deployments etc. If unaddressed, this can erode an individual off its psychological resilience (Papathanasiou et al., 2015; Lefkowitz & Slade, 2019). Since there is limited access to psychological and other mental health support systems on board, it is important to formulate, administer and evaluate targeted preventive interventions. Following the path paved by Hobfoll's (1989), Conservation of Resources Theory (COR), this intervention was intellectualized to uphold the capacity of the cadets to acquire, enhance and replenish the psychological resources so as to combat with the challenges of maritime environments. The results obtained highlight the effectiveness of the intervention, thus marking its efficacy in the pre-sea training programs. The current intervention study, though specific to Indian merchant navy cadets, shows good prospects for applicability to other similar professional groups within Isolated, Confined, and Extreme work environments. Other professional groups who share similar issues of social isolation, stress pressures, hierarchical structures, and access to and

support for mental well-being services are similar to the merchant navy cadre and include polar explorers (Palinkas & Suedfeld, 2008), astronauts on space explorations (Sandal et al., 2020), personnel on submarine explorations (Bartone et al., 2019), and oil rig explorers (Hannah et al., 2018). Current evidence of the efficacy of the applicability of similar intervention programs to increase resilience, improve ability to deal with emotions, and increase self-efficacy shows similar successes for the enhancement of the psychological well-being of the above-mentioned professionally isolated confined environments stressed groups of people, such as astronauts on space explorations (Sandal et al., 2020), Wu et al., 2021). Considering the similar psychological stressors for the above-mentioned groups of people, the Conservation of Resources theory base for such resource-based theories of stress and other related issues shows good evidence for creating customized resource-based programs for well-known theories such as COR theory developed by Hobfoll (1989).

As observed by numerous researchers, resilience as a trait can be cultivated through targeted interventions intended at improving self-regulation, adaptive appraisal, and resource building (Neenan, 2009; Tugade & Fredrickson, 2004). Consistent with H1, cadets in the experimental group who underwent the intervention, reported higher scores in resilience both at the post-test and follow-up. Moreover, the analysis revealed a strong effect size associated with the time by group interaction. The results thus align with the theoretical framework of COR, which posits that the strategic build-up of personal resources alleviates susceptibility to stress and nurtures psychological adaptability (Hobfoll et al., 2018).

Referring to H2a and H2b, there was a different effect of the intervention on the emotion regulation strategies. Cadets in the experimental condition demonstrated an increase in cognitive reappraisal and a decrease in suppression with the later showing a significant interaction between groups. Furthermore, these findings are congruent with Gross (2015) process model of emotion regulation, which posits the adaptive function of reappraisal as guiding cognitive strategy in emotional contexts and fostering psychological flexibility and resilience. Importantly, the observed reduction in expressive suppression—a less adaptive strategy often associated with strained social interactions and lower mental health outcomes (Hu et al., 2014)—highlights the effectiveness of psychological interventions in reshaping long-standing regulation patterns among young adult populations.

Compared to the control group, the experimental group participants scored significantly high in self-efficacy-consistent with H3. Utilizing Bandura's theory of self-efficacy (1997), it can be stated that this intervention resulted in better exposure to mastery experiences, peer modelling and verbal persuasion. The findings hold particular relevance for training merchant navy cadets, as their highly demanding profession requires strong self-efficacy. This psychological resource has been linked to increased task involvement, better stress regula-

tion, and sustained effort in the face of adversity (Luszczynska et al., 2005).

Consistent with H4a to H4d, cadets in the experimental group reported improved scores in all the four domains of WHOQOL-BREF. Previous researches focussed on activities related to gratitude, mindfulness and cognitive interventions have demonstrated similar effects which are multidimensional and have resulted in overall well-being Keng et al., 2011; Emmons & McCullough, 2003; Seligman et al., 2005). Although the intervention did not directly aim to improve physical health (e.g., physical exercise or diet-related modules), scores might have improved because of the indirect effects of the intervention on improving sleep quality, decreasing psychosomatic symptoms and so on (Gross, 2015; Chiesa & Serretti, 2009). According to Conservation of Resources (COR) theory, quality of life includes both internal psychological resources and external nominal resources, the former of which refers psychological assets that play a vital role for cadets to adapt themselves to a rigorous academic and demanding environment.

COR theory states that individuals aim to retain, protect and also enhance their personal resources in order to face the challenges of life and those who manage to maintain greater initial resources are more capable of reproducing gains over time (Hobfoll, 2002). Thus, through this intervention, this theoretical premise finds a strong empirical validation. Based on this it can be stated that, resource enhancement, if done at the early stage of an occupational journey, has great benefits. It may be reasonably inferred that this intervention initiated a gain spiral which will enable the cadets to withstand the demands of seafaring life.

The study provides a cost-effective and replicable psychological training model for marine education systems. Adding a structured workbook along with experiential group work designed a comprehensive learning environment that allowed individual reflection as well as co-development between the peers. Further, the scalability of the intervention provides it a good fit for incorporation into traditional pre-sea training courses, thus bridging a critical gap in the psychological preparedness of cadets (Rothblum, 2000).

Additionally, the current research contributes to the new literature on positive psychological interventions (PPIs) in the workplace. The results confirm that PPIs, theory-based and population-specific, have the potential to produce substantial changes not only in internal affective processes but also in general life functioning (Sin & Lyubomirsky, 2009).

Limitations and Future Research

There are several limitations of the study, although the findings are promising. The relatively small size of the sample ($N = 30$) prohibits generalization and may result in a risk of Type II error, particularly in the identification of interaction effects showing small effect sizes. Future research should seek to replicate these findings and consider research with larger, more diverse

samples (including both genders) from multiple maritime academies.

Moreover, the relatively small sample size ($N = 30$) introduces integral constraints on statistical sensitivity. A sensitivity power analyses was carried out and it showed that only large effects could be detected by the study approximately $r = .48$ for correlations and $d = 1.06$ for between-group comparisons with the adequate power of 80%. Thus an important limitation might be that important effects meaningful in nature might not have been detected. Also because of the wide confidence intervals, precision has been reduced. Hence, both positive and null findings must be approached with caution. Subsequent research utilizing larger and more heterogeneous cohorts will improve the precision of reported effects and provide a more definitive evaluation of the intervention's robustness and general relevance.

As the intervention was culturally tailored for Indian merchant navy cadets, generalizability to other cultural contexts should be interpreted with caution.

Further, there is always the potential of response biases when using self-report measures, especially social desirability effects in a military training environment. Incorporating behavioural or physiological indices, e.g., sleep, cortisol, or performance information from simulations—could offer convergent validity in future research. The three-month follow-up interval, while useful for assessing short-term maintenance, is too brief to assess long-term resilience and quality of life trend during actual deployments. Performing longitudinal assessments within the first sea term or deployment would result in information which is more applicable to the real maritime settings on the sustainability of the intervention and its practical impact. Subsequently, followup studies may investigate the change processes with mediational models (i.e., whether changes in emotion regulation mediate the effects on resilience and self-efficacy), and also putative moderators such as personality traits, previous adversities, or family support.

CONCLUSION

This investigation substantiates the efficacy of a concise psychological intervention in augmenting intra-personal and interpersonal resources critical to Indian merchant navy cadets. The intervention, based on COR theory and occupational demand, resulted in significant and sustained increases in resilience, emotion regulation, self-efficacy, and quality of life. These results underscore the worth of proactive, context-based psychological skill development in high-stakes occupational training and provide a scalable model for the enhancement of mental readiness in seafarers and other high-risk occupations.

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