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IMPACTS OF YOGIC PRACTICES WITH MEDICATION ON SEASICKNESS AND MOTION SICKNESS ON BLOOD PRESSURE AND LIFE SATISFACTION OF NAVAL PERSONNEL

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ABSTRACT

Seasickness and motion sickness are common occupational problems among naval personnel exposed to prolonged maritime movement, vibration, and environmental instability. These conditions may adversely affect cardiovascular regulation, emotional well-being, and operational performance. Yogic practices have been suggested as effective complementary interventions for improving psychophysiological adaptation and stress regulation in high-demand occupational environments. A randomized experimental comparative study was conducted among 320 naval personnel aged 25–40 years stationed aboard a major naval war ship in Mumbai, India. Participants were equally divided into control or experimental groups comprising 160 participants each. The experimental group established yogic practices combined with medication for twelve weeks, five days per week, while the control group established medication alone. Blood Pressure (BP) and life satisfaction were assessed using pre-, mid-, and post-tests evaluations. Information were examined using mean, SD, independent t-test, or paired t-test at $p < 0.05$. The experimental group established a marked decrease in Systolic Blood Pressure (SBP) from 132.08 ± 5.56 mmHg to 122.67 ± 3.55 mmHg following intervention. Life satisfaction scores also increased substantially from 3.16 ± 1.14 to 6.75 ± 1.39. Substantial between-group variances were observed for SBP and life satisfaction at post-test assessment. Yogic practices combined with medication significantly improved cardiovascular regulation, emotional well-being, and psychophysiological adaptation among naval personnel experiencing seasickness and motion sickness. Integrated yoga-based interventions may serve as effective complementary occupational health strategies in naval environments.

KEYWORDS: Yoga therapy, Seasickness, Motion sickness, Blood pressure, Life satisfaction

INTRODUCTION

Vestibular problems frequently include seasickness or motion sickness in response to the repeated exposure to motion stimuli (pitch, roll, vibration and acceleration) in maritime settings. This is especially problematic for Navy personnel who are deployed at sea and face ongoing alterations of their vestibular function and exposure to occupational stressors that negatively impact their physiological and psychological function. Nausea, dizziness, vomiting, autonomic instability, fatigue and loss of operational efficiency have been reported as the symptoms of seasickness among sailors and officers in the navy (Gupta et al., 2021). Modern methods like mindfulness-based neurocognitive interventions have also emphasized the importance of control over attention in the reduction of seasickness symptoms and better adaptation to maritime motion environment (Bao et al., 2025).

The psychophysiological demands placed on the occupation of mariner are significant due to long work hours, the environment of restricted space, disturbance of sleep, the environment of instability, and pressure from operational demands. These stressors can be responsible for cardiovascular regulation by vestibular-autonomic interactions and sympathetic nervous system activation. Occupational stress and autonomic dysfunction due to movement is taken as one of the key physiological effects that may be involved in Blood Pressure (BP) dysregulations. Yoga practices have been shown to have a profound impact on BP and heart rate variability (HRV) in previous intervention studies via mechanisms of autonomic modulation and parasympathetic activation (Ahuja et al., 2025). Arya et al., (2024) also noted similar results among the Indo-Tibetan Border Police Officers where the yoga intervention group had a significant reduction in BP and physiological stabilization under high-stress operational situations. Yoga has also been proven to be an effective approach to lower the hypertension and better control the cardio-metabolism regulation through systematic reviews and randomized trials (Cramer et al., 2016; Dhungana et al., 2021). A recent meta-analysis further underscored the positive impact of yoga in the management of arterial hypertension, via integrated mind–body mechanisms (Geiger et al., 2025).

Seasickness and occupational strain have a negative impact on psychological well-being and life satisfaction as well as physiological effects. Emotional fatigue, occupational stress, anxiety, diminished coping, and diminished quality of life are common issues among naval personnel. Subjective well-being and psychological adaptation in stressful occupational

contexts is believed to be important in terms of life satisfaction. Evidence from research indicates that yoga, meditation and mindfulness interventions have a substantial positive effect on decreasing stress, anxiety and depression as well as increasing emotional well-being and resilience (Breedvelt et al., 2019). Yoga based intervention have also shown positive results in reduction of stress and psychological health in women and other vulnerable groups (Shohani et al., 2018). In the case of Armed Forces, yoga interventions led to increased self-efficacy, psychological immunity and life satisfaction, which reflect greater emotional resilience and occupational adaptation (Pandey et al., 2024; Pandey et al., 2025).

Yoga has developed into a holistic psychophysiological treatment that combines different aspects such as yoga postures, breathing exercises, relaxation and mindfulness. From clinical evidence, it has been observed that Yoga enhances the regulation of emotions, cardiovascular function, stress coping mechanisms and autonomic balance (Field, 2011). The mechanisms of self-regulation in yoga are thought to be associated with vagal stimulation, the predominance of the parasympathetic nervous system, improvement in mindfulness and production of neurophysiological relaxation responses (Gard et al., 2014). Meta analysis results have also revealed that yoga and mindfulness-based practices lead to a significant decrease in stress related physiological markers and positive results on psychological outcome (Pascoe et al., 2017). What is also clear from systematic reviews is that yoga alleviates stress via several biopsychosocial mechanisms, such as emotional regulation, cognitive restructuring and autonomic stabilization (Riley & Park, 2015). Thus, yoga has been suggested as an effective tool to improve well-being and adaptation to stress in demanding work conditions (Saoji, 2016). Yoga intervention has been found to be beneficial for physiological and psychological well-being in military operational environments in several studies with military and veterans (Groll et al., 2016). Qualitative evidence also among military personnel indicates that yoga increases emotional stability, resilience, relaxation and coping skills (Hurst et al., 2018). But despite the increasing evidence in favour of yoga-based interventions, less research have precisely examined the consequence of yoga combined with medicines on BP as well as life satisfaction of the naval personnel suffering from seasickness and motion sickness. These previous studies have primarily investigated either physiological or psychological outcomes only, and there has been little research that considers integrated psychophysiological adaptation in marine settings.

Hence present the research was directed to examine the consequence of Yogic practice with medicine on BP and satisfaction in life of the sea sickness/motion sickness patients of the Indian Navy. This study will give scientific proof of the effectiveness of yoga as a balancing treatment to improve cardiovascular regulation, emotional state and adaptation in the work of the sailor.

Objectives of the Study

1. To assess the combined effect of yogic practices and medication on blood pressure (systolic and diastolic) and life satisfaction among naval personnel experiencing seasickness and motion sickness.
2. To measure the feasibility of incorporating integrated yoga-based interventions into routine health and morale enhancement protocols onboard naval vessels.

2. METHODOLOGY

2.1 Study Design

The evaluation of the impact of yogic practices in combination with medicine on BP and life satisfaction of the naval personnel experiencing seasickness and motion sickness was done in the present study through a randomized experimental comparative research design. The study adopted the repeated measures method with pre-, mid-, and post-tests evaluation. Randomized experimental or control groups were created to compare the physiological and psychological results after a twelve-week intervention program, which included a structured sequence of activities. Design was chosen on the basis of establishing causal relationships between the intervention and the dependent variables.

2.2 Study Setting

The study was carried out among sailors of a big naval war ship in Mumbai, India. The maritime occupational environment was a source of stressors related to motion, such as pitch, roll, vibration and acceleration, which are all linked to seasickness and motion sickness. Data collection and intervention sessions were conducted in the actual naval environment with no disruption of normal work duties. The chosen setting was suitable to assess the efficiency of yoga-based interferences as they are located in a realistic occupational and environmental context of naval sailors and officers.

2.3 Participants

The subjects ranged from naval sailors and officers, 25 to 40 years old, who suffered from seasickness and motion sickness during the normal course of naval activity. The study involved a total of 320 Navy persons. Before recruiting subjects, screening was done to ensure the subjects were suitable for participation in yoga practices and experimental procedures. The participants were from various ranks in the naval unit. Before the formation of experimental and control groups, all participants were apprised with the aims and methodology of the study.

2.4 Sample Size and Sampling Technique

The number of the samples of the present study were 320 naval personnel were selected by simple random sampling technique. In the first step, 450 naval personnel were screened then in the second step eligible participants were designated as per the inclusion or exclusion standards. The selected participants were equally separated into two groups, 160 participants in each group. Group A was the experimental group which received the yoga interference in adding to the

suppository and group B was the control group that conventional only the suppository. To reduce allocation bias and enhance the internal validity, we used randomization.

2.5 Inclusion and Exclusion Criteria

This investigation included naval personnel aged 25-40 years willing to contribute in the research. The individuals had to be in good health and able to carry out yoga practices and be able to follow the study instructions. Patients with severe psychiatric disorders, cognitively unstable or having medical disorders that prevented them from doing yoga were excluded. The individuals who could not give informed consent were also excluded. The criteria were defined to guarantee participants' safety, consistency of interventions, and reliability of physiological and psychological outcome measures.

2.6 Intervention Protocol

The experimental group was given a organized yoga interference in adding to their usual medication for 12 weeks. The intervention was delivered five times a week for 60 minutes each, between 5:30AM and 6:30AM. Yoga Practices conducted were Opening Prayer, StHula Vyayama, Sukshma Vyayama, Surya Namaskar, Selected Asana, Pranayama, Mudras, Bandhas, Meditations, and Kriya Practices. The intervention was supervised to guarantee uniformity and safety of the subjects. Medication and routine medical care were given to the control group, and yoga was not.

2.7 Yoga Components

The yoga intervention comprised integrated yogic practices for enhancing psychophysiological adaptation among naval personnel. Asanas were performed as Baddha Konasana, Pawanmuktasana, Sethu Bandhasana, Mandukasana, Supta Vajrasana, Trikonasana, Vajrasana, or Savasana/Yoga Nidra. The pranayama exercises used were Nadi Shodhana, Chandra Bhedana, Seethali, Seetkari and Bhramari. Other practices that were used as part of the integrated intervention protocol included Pushan Mudra, Chin Mudra, Vishahara Mudra, Maha Bandha, Udyana Bandha, Jalandara Bandha, Moola Bandha, Om chanting, Adhaar Kriya, and Kunjal Kriya.

2.8 Outcome Variables

Physiological and psychological parameters evaluated in the study were those related to seasickness and adaptation to motion sickness. The main psychological variable was life satisfaction, with Systolic Blood Pressure (SBP) or Diastolic Blood Pressure (DBP) as physiological variables. These variables were chosen for the study according to the purpose of the study and the psychophysiological effects that were suggested by the yogic practices. The results were assessed prior to, during and following the intervention period to determine progressive changes and the efficiency of the intervention among experimental and control groups.

2.9 Instruments Used

BP was measured with a digital sphygmomanometer (mmHg). All subjects had their BP values obtained under standard conditions both systolic and diastolic. Life satisfaction was measured using a standardised life satisfaction questionnaire which was developed to measure subjective psychological well-being and emotional satisfaction among the participants. The instruments chosen were suitable for the measurement of physiological and psychological outcomes linked to occupational stress, seasickness and motion sickness of the naval personnel that were involved in the intervention programme.

2.10 Data Collection Procedure

Repeated Measures pre-, mid-, and post-tests design was applied in data collection, both experimental and control group. Baseline measurement was taken previous to the start of the intervention sequencer. Progressive changes were assessed by mid-testing during the intervention and post-testing was carried out at the end of the twelve-week interference. All individuals had BP and life satisfaction scores taken systematically. The procedure was standardized to both groups to give uniformity and reliability of data collected.

2.11 Statistical Analysis

Collected information were subjected to suitable statistical analyses to measure efficiency of the interference. The mean and SD of all variables were calculated. Within groups, paired t-tests were primarily used to equivalence pre-test or post-test scores, while mid-test assessments were descriptively evaluated to monitor progressive changes. Independent t-tests were used to test alterations among the experimental and control groups. A probability level of $p < 0.05$ was used to regulate statistical implication. The analysis was performed to find out the physiological and psychological effects on the naval people after practising yoga with medicines.

2.12 Ethical Approval

The institutional ethical committee of Meenakshi Academy of Higher Education & Research in Chennai accepted the research protocol. All participants signed a written informed consent statement before starting the study. This trial was registered as Clinical Trials Registry–India (CTRI) with trial ID as CTRI/2026/01/101595. Participants were told about the study process, the voluntary nature of the study, confidentiality, and that they could withdraw from the research at any time. Throughout the investigation ethical guidelines and considerations regarding the welfare of the participants and transparency of research were upheld.

3. RESULTS

3.1 Baseline Features

A total of 320 naval personnel contributed in the research, including 160 participants in the control group and 160 individuals in the experimental group. All participants fitted to the age group of 25-40 years. Baseline comparison demonstrated that systolic or DBP values were similar between groups, whereas baseline life satisfaction scores were slightly higher in the experimental group (Table 1).

Table 1. Baseline features and group comparability

Variable	Control Group Mean ± SD	Experimental Group Mean ± SD	t-value	p-value
Sample size	160	160	-	-
Age range	25–40 years	25–40 years	-	-
Pre-test systolic BP	131.71 ± 5.23	132.08 ± 5.56	0.61	0.542
Pre-test diastolic BP	78.01 ± 5.31	76.84 ± 5.71	-1.90	0.059
Pre-test life satisfaction	2.92 ± 0.92	3.16 ± 1.14	2.10	0.037

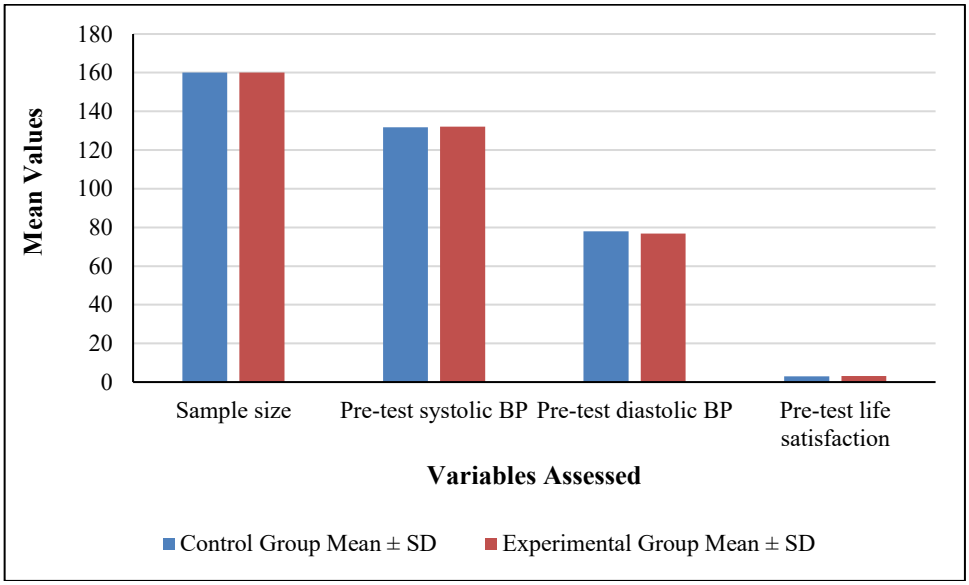

Figure 1. Baseline Comparison of Control and Experimental Groups

The sample size, systolic and DBP readings prior to testing, and pre-test life satisfaction score of the control or experimental groups are presented in Figure 1 and are comparable at baseline. At baseline, both groups were similar in physiological characteristics, with slightly greater initial life fulfilment scores in the experimental group as associated to the control group.

3.2 Blood Pressure Analysis

Physiological improvement was progressive in both groups during the intervention period as evidenced in BP analysis. But the experimental group had suggestively more decrease in SBP than the control group. The control group displayed a mild reduction from 131.71 ± 5.23 mmHg to 129.44 ± 4.73 mmHg, whereas the experimental group demonstrated a marked reduction from 132.08 ± 5.56 mmHg to 122.67 ± 3.55 mmHg. There was no substantial change in the DBP of both groups during the study period (Table 2).

Table 2. Blood pressure changes across pre-, mid-, and post-tests assessments

Variable	Group	Pre-Test Mean ± SD	Mid-Test Mean ± SD	Post-Test Mean ± SD
Systolic BP	Control Group	131.71 ± 5.23	130.52 ± 4.59	129.44 ± 4.73
Systolic BP	Experimental Group	132.08 ± 5.56	128.55 ± 5.23	122.67 ± 3.55
Diastolic BP	Control Group	78.01 ± 5.31	77.82 ± 4.19	77.91 ± 4.13
Diastolic BP	Experimental Group	76.84 ± 5.71	77.28 ± 4.86	77.62 ± 4.62

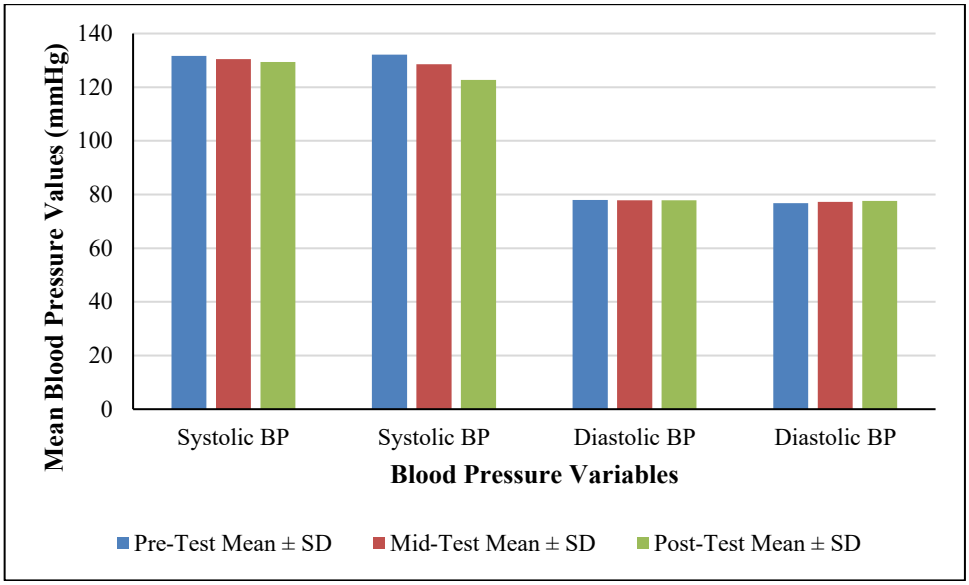

Figure 2. Changes in Blood Pressure Variables Across the Intervention Period

Figure 2 shows the alteration in systolic or DBP levels after pre-, mid-, and post-tests. There was significantly lower mean values of SBP in the experimental group after yoga intervention while mean values of DBP in the experimental group remained relatively unchanged. The results show that cardiovascular regulation and physiological adaptation were better during the intervention period.

3.3 Life Satisfaction Analysis

Life satisfaction ratings showed that there was an increase in life satisfaction during the intervention period for both groups, but psychological improvement was suggestively developed in the experimental group than in the control group. The control group showed moderate improvement from 2.92 ± 0.92 to 3.53 ± 0.76. The experimental group, instead, showed significant improvement from 3.16 ± 1.14 to 6.75 ± 1.39. Findings from the mid-test also showed that participants in the experimental group experienced psychological improvement early on, meaning that the experimental group experienced rapid emotional adaptation and improved subjective well-being after yoga intervention.

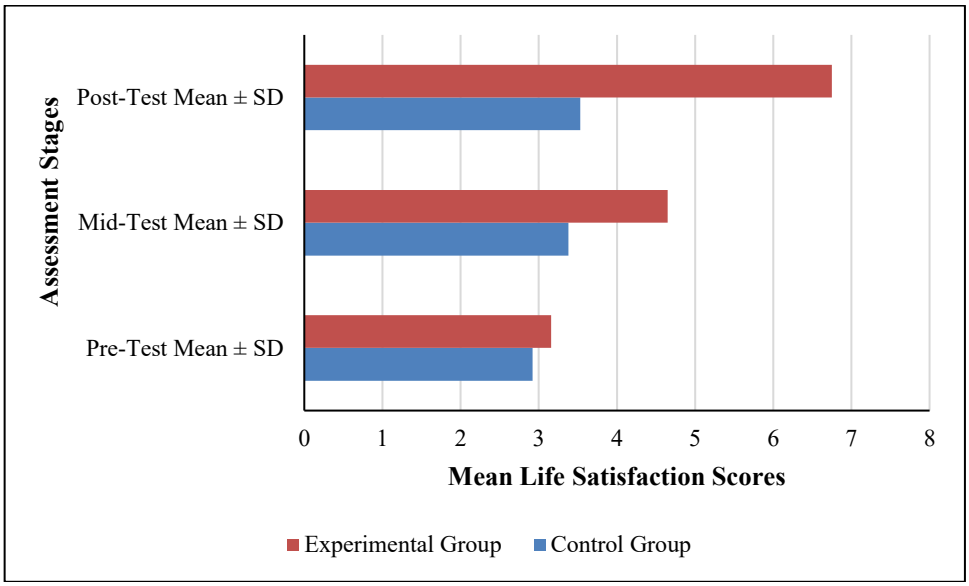

Figure 3. Comparison of Life Satisfaction Scores Among Control and Experimental Groups

The mean life satisfaction scores of control and experimental groups at pre-, mid-, and post-tests are displayed in Figure 3. Levels of life satisfaction were suggestively advanced in the experimental group as associated to the control group, and within the experimental group, there was a progressive and substantial rise in the levels of life satisfaction throughout the interference period.

3.4 Within-Group Comparisons

Statistically significant differences across the variables during the intervention period were noted using within group paired t-test analysis. Both groups had statistically significant decreases in SBP but the amount of decrease was knowingly larger in the experimental group. There were also substantial increases in life satisfaction scores for both groups. The variations in DBP were relatively smaller and displayed no substantial alteration physiologically on the control group.

The results in general revealed a better psychophysiological adaptation in the group which received Yoga intervention (Table 3).

Table 3. Within-group paired t-test analysis

Variable	Group	Comparison	Mean Change	t-value	p-value
Systolic BP	Control Group	Pre–Post	-2.27	-10.71	<0.001
Systolic BP	Experimental Group	Pre–Post	-9.41	-20.19	<0.001
Diastolic BP	Control Group	Pre–Post	-0.09	-0.44	0.663
Diastolic BP	Experimental Group	Pre–Post	+0.78	2.86	0.005
Life Satisfaction	Control Group	Pre–Post	+0.61	10.48	<0.001
Life Satisfaction	Experimental Group	Pre–Post	+3.59	30.22	<0.001

3.5 Between-Group Comparisons

Amid group variances were found for SBP and life satisfaction at the post-test assessment using the independent t-test analysis. SBP was meaningfully reduced and life satisfaction scores suggestively enlarged in the experimental group than control group. Statistically non-significant variance in DBP between groups throughout the study period. These results indicated that yoga therapy along with drug therapy yielded better physiological and psychological result than drug therapy alone for naval personnel with seas sickness and motion sickness (Table 4).

Table 4. Between-group independent t-test analysis

Variable	Stage	Mean Difference (Experimental–Control)	t-value	p-value
Systolic BP	Pre-Test	+0.37	0.61	0.542
Systolic BP	Post-Test	-6.76	-14.46	<0.001
Diastolic BP	Pre-Test	-1.17	-1.90	0.059
Diastolic BP	Post-Test	-0.29	-0.60	0.549
Life Satisfaction	Pre-Test	+0.24	2.10	0.037
Life Satisfaction	Post-Test	+3.22	25.76	<0.001

DISCUSSION

The current study assessed the effects of yogic practices along with medicines on the life satisfaction level and BP levels of the naval personnel suffering from seasickness and motion sickness. Results showed significant psychophysiological improvement after yoga intervention of 12 weeks. When associated with the control group that took only medication, the experimental group had a substantial drop in SBP, and a strong upgrading in life satisfaction. The results indicated that integrated yogic practices could be an effective method to improve cardiovascular regulation and psychological well-being in naval personnel who are subjected to the prolonged occupational and environmental stressors.

The most important physiological result of the investigation was that there was a very striking reduction in the SBP of the experimental group. The alteration among the pre and post-test mean values of SBP (132.08 ± 5.56 mmHg to 122.67 ± 3.55 mmHg) revealed a significant cardiovascular improvement after yoga intervention. This decrease could be linked with autonomic nervous system control and the decrease in sympathetic overactivity that is caused by yogic breathing and relaxation techniques. Yoga based interventions have also been previously shown to have a significant effect on BP control by promoting parasympathetic activation and improved heart rate variability (Telles et al., 2014; Tyagi & Cohen, 2016). Systematic reviews have also shown that yoga is an effective antihypertensive lifestyle intervention that can help to improve cardiovascular stability and decrease physiological stress responses (Wu et al., 2019; Tyagi & Jain, 2025).

DBP did not change significantly during the involvement period, but there was a small improvement in the experimental group. This greater relative reduction in the diastolic value than in the systolic reduction could imply that the yoga practices are more likely to affect reactivity of cardiovascular parameters and modulation of autonomic function during stress than basal vascular resistance. Vestibular-autonomic disturbances and physiological instabilities are present in motion sickness and occur during long exposure to maritime conditions (Wada, 2021). Thus, the present findings indicated that yoga intervention could lead to gradual autonomic stabilization and increase in cardiovascular resilience and decrease the physiological adaptation to occupational stress induced by the motion.

The psychological outcomes of the current study displayed that there was a substantial rise in life satisfaction for the yoga intervention group. Experimental group demonstrated steady growth from 3.16 ± 1.14 at the pre-test to 6.75 ± 1.39 at the post-test, which demonstrated high emotional stabilization and subjective wellbeing. These changes could be linked to improved coping with stress, emotional control, and psychological adaptation due to meditation, breathing and relaxation techniques. The current study also confirms that yoga interventions are effective in enhancing the quality of life, emotional health and psychological resilience through mindfulness based self-regulation mechanisms (Woodyard, 2011). Yoga and meditation exercises have also shown positive results in reducing stress, emotional health and psychological adaptation in the people who are impacted by the occupational stress and challenging environment (Tolahunase et al., 2017).

The results in the present research could be clarified in terms of a physiological and psychological mechanisms related to yoga practices. Pranayama exercises like Nadi Shodhana and Bhramari are thought to activate the vagal activity and encourage the parasympathetic dominance, thus enhancing the autonomic balance and decreasing the sympathetic activation. Yoga Nidra, Savasana, and Om chanting can be additional relaxation techniques that can help stabilize

emotions, foster mindfulness, and enhance stress resilience. The combined practices probably increased the psychophysiological adaptation of the naval personnel subjected to seasickness and occupational psychophysiological stress. Thus, the effect of the combined intervention seemed to be on both cardiovascular regulation and psychological well-being.

The outcomes of the current research are clinically significant and have an impact on the field of work for naval health care systems. Yoga interventions can be used as effective non-pharmacological supportive therapy for regulating the physiological and psychological stress due to maritime occupational stress. Better cardiovascular control and emotional stability can help improve readiness for operations, adaptation to the job and psychological stability of naval personnel. There were some methodological strengths of the study, such as the large sample size, random comparative design, repeated-measures assessment, and simultaneous assessment of a variety of physiological and psychological variables. Some limitations need to be noted, however: uncontrolled lifestyle factors, the self-reported psychological assessment and the restriction to one naval occupational setting. Further studies are suggested to be done with larger patient numbers from multiple centers, longer periods of follow-up and with the inclusion of biochemical stress markers to further elucidate the mechanisms of psychophysiological adaptation after doing yoga.

5. CONCLUSION

The study showed that, yogic practices along with administration of drugs show significant changes in physiological and psychological parameters among naval personnel suffering from seasickness and motion sickness. The experimental group experienced a substantial decrease in SBP and a substantial development in life satisfaction when likened with the control group (medication alone). These findings suggest that integrated yoga-based intervention helped to attain better cardiovascular regulation, emotional stability, stress adaptation and psychophysiological resilience in the context of the long-lasting occupational exposure at sea. The intervention seemed to have a relaxing, pranayama, meditation and mindfulness-based impact on autonomous control, which resulted in decreased sympathetic activation and psychological well-being. The observed improvement in life satisfaction further indicated greater coping ability, emotional resiliency and occupational adaptation of naval personnel exposed to motion related stressors in a naval environment. The study also stated the possibility of introducing structured yoga practices in the healthcare and morale improvement scheme of the navy. The large number of the sample, the randomized experimental design and the repeated-measures assessment enhanced the scientific validity of the investigation. Future research is needed considering multicenter naval population, extended follow-up, and objective biochemical stress markers to further elucidate the lasting psychophysiological effects of yoga involvements. In general, integrated yogic practices could be effective supportive interventions in promoting cardiovascular stability, emotional well-being and operational readiness of the naval personnel faced with seasickness and motion sickness.

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