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A study on human rights, work stress, and quality of life among Indian seafarers

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Abstract
This study examines the relationship between occupational stress and quality of life (QOL) among Indian seafarers, highlighting that decent working conditions and mental well-being are vital aspects of maritime welfare. Data were collected from 80 male seafarers from Goa using standardized tools the Occupational Stress Index (OSI) and WHOQOL-BREF to measure stress and QOL across physical, psychological, social, and environmental domains. Statistical analyses, including t-tests, ANOVA, correlation, and exploratory factor analysis (EFA), revealed a strong negative correlation between occupational stress and QOL, showing that higher stress significantly reduces life satisfaction. Work-related factors such as promotion opportunities, working conditions, and bonuses were found to influence both stress and QOL outcomes. The EFA identified three underlying dimensions—Perceived Role Deficiency, Organizational Strain, and Psychosocial Alienation—demonstrating the multifaceted nature of maritime occupational stress. The findings emphasize the need for improved work environments, fair employment practices, and mental health interventions to enhance the overall well-being and quality of life of Indian seafarers.

Keywords: Occupational stress, seafarers, quality of life, maritime work, factor analysis JEL classification: J28, I31, J81, J24, I14

Introduction

Seafaring is one of the world's most demanding professions, where prolonged isolation, long working hours, and hazardous conditions often threaten not only health but also fundamental human rights. This study examines the interconnection between human rights, occupational stress, and quality of life (QOL) among Indian seafarers, emphasizing that decent working conditions, mental well-being, and dignity at work are core human rights concerns. By analyzing demographic and work-related factors influencing stress and QOL, the research highlights how role overload, organizational pressures, and psychosocial alienation affect seafarers' overall welfare, underscoring the urgent need for policies that safeguard both their occupational health and human rights at sea.

It is essential to know these determinants to design targeted interventions to enhance sea farers overall health, job satisfaction, and quality of life.

Literature Review

The relationship between occupational stress and quality of life (QOL) among seafarers has been the focus of extensive research recently, largely due to the complex and demanding nature of maritime work environments. Studies indicate that the combined effects of prolonged working hours, separation from loved ones, physical dangers, and limited access to psychological support are significant contributors to elevated stress levels and decreased life satisfaction. Jensen and Oldenburg (2021) [5] emphasized the need for both objective and subjective measures to assess stress in seafarers, noting that stress perceptions vary significantly depending on individual resilience and the specific circumstances onboard. They highlighted the importance of developing customized stress assessment tools tailored to the unique conditions of seafaring. Baygi *et al*. (2022) [2] employed structural equation modeling to explore seafarers' life satisfaction and mental health, concluding that both demographic factors (such as rank and age) and mental health status are vital predictors of perceived life satisfaction, supporting the notion that psychological well-being is essential for QOL. Kim and Jang (2018) [6] investigated the influence of self-efficacy and organizational culture on perceived fatigue and QOL. Their findings revealed that cultural support at the unit level significantly mitigates job stress, acting as a protective factor against burnout, which aligns with the theory that organizational and environmental factors influence stress outcomes.

Xiao *et al*. (2017) examined the importance of social support and found a strong, positive correlation between social integration and health-related QOL among Chinese seafarers. Their study underscores the critical protective role of supportive relationships in alleviating occupational stress. Slišković and Penezić (2015) conducted one of the initial substantial assessments of occupational stressors, hazards, and health issues affecting maritime workers, identifying various psychosocial stressors, including isolation, boredom, and exposure to hazardous situations, that collectively affect seafarers' physical and mental health. Building on this, Buscema *et al*. (2023) [3] integrated lifestyle factors with work life quality (QoWL), demonstrating that sleep quality, nutrition, and substance use significantly influence seafarers' perceived work-related stress and overall QOL, highlighting the interaction of personal lifestyle elements with occupational factors. Ali *et al*. (2023) [1] performed a qualitative review of psychometric instruments used to measure work stress in seafarers, concluding that most existing tools lack specificity for the unique conditions of the maritime environment, suggesting the development of measures specifically for seafarers to improve validity and reliability.

Finally, Carotenuto *et al*. (2012) [4] provided a conclusive overview of psychological stressors on ships, identifying emotional exhaustion, limited peer support, and restricted

autonomy as common factors contributing to mental health decline in seafarers. They argued that resilience-building programs and organizational interventions are crucial. The literature supports the view that occupational stress within the seafaring sector is multidimensional, resulting from work overload, psychological pressures, environmental challenges, and inadequate support systems. These stressors detrimentally affect quality of life. Research consistently validates a negative relationship between occupational stress and QOL, reinforcing Ha1 of this study. Furthermore, the evidence advocates for demographic-specific interventions and emphasizes the need for more advanced assessment tools to understand better and address seafarers' health outcomes.

Objectives of the Study

1. To examine the relationship between occupational stress and quality of life (QOL) among Indian seafarers within a human rights framework.
2. To assess the influence of work-related and demographic factors—such as promotion opportunities, working conditions, and experience—on seafarers' occupational stress and overall well-being.

Hypotheses of the Study

H_{01}: There is no significant relationship between occupational stress and quality of life among Indian seafarers.

H_{11}: There is a significant negative relationship between occupational stress and quality of life among Indian seafarers.

Research Methodology

The research evaluated occupational stress and quality of life (QOL) in 90 male seafarers in Goa, aged 25 to 60, using a convenience sampling technique. Grouping variables included demographic and occupational factors such as age, qualification, birth order, ship type, designation, experience, home visits, insurance, pension, work distribution, working conditions, bonuses, promotion scope, salary benefits, and career duration. Data was collected via a personal data sheet and standardized questionnaires, and subsequently analyzed with Jamovi and Microsoft Excel. The methodologies included descriptive statistics, Pearson correlation, one-way and two-way ANOVA, t-tests, and Exploratory factor analysis to test hypotheses and assess stress-QOL associations, subgroup differences, and interaction effects.

Data Analysis and Interpretaion

Descriptive Statistics of Osi

Table 1: Descriptives Statistics

	OSI	Role Overload	Role Ambiguity	Role Conflict	Unreasonable Group and Political Pressures	Responsibility for Persons	Underparticipation	Powerlessness	Poor Peer Relations	Intrinsic Improvishment	Low Status	Stressful Working Condition	Unprofitability
N	80	80	80	80	80	80	80	80	80	80	80	80	80
Missing	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean	128	19.0	7.83	14.1	12.3	11.9	10.3	7.85	12.1	11.2	6.05	11.2	4.66
Median	128	19.0	7.00	14.0	13.0	12.0	10.0	8.00	12.0	11.0	6.00	11.0	4.00
Standard deviation	9.87	3.37	2.47	2.08	2.63	2.10	2.72	1.41	1.70	1.32	1.71	2.21	1.56
Minimum	99	6	4	9	4	6	6	4	6	8	3	7	2
Maximum	157	25	16	19	17	19	20	11	16	15	12	16	10
Skewness	0.218	-1.03	0.895	0.105	-0.848	-0.329	1.29	0.0213	-0.853	0.186	0.943	0.170	0.996
Std. error Skewness	0.269	0.269	0.269	0.269	0.269	0.269	0.269	0.269	0.269	0.269	0.269	0.269	0.269
Kurtosis	0.485	3.21	0.696	0.522	0.626	1.99	1.76	-0.0725	2.30	-0.325	1.51	-0.790	1.28
Std. error kurtosis	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532	0.532
ShapiroWilk W	0.985	0.899	0.933	0.947	0.933	0.916	0.886	0.928	0.917	0.921	0.912	0.959	0.885

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Table 2: Descriptives Statistics

		Physical Health	Psychological Health	Social Relationships	Environment	QOL
N		80	80	80	80	80
Missing		0	0	0	0	0
Mean		24.6	23.3	13.2	31.6	101
Median		25.0	24.0	13.0	32.0	102
Standard deviation		2.27	2.53	1.40	3.61	8.55
Minimum		19	16	9	20	73
Maximum	29	28	15	40	118	
Skewness	-0.217	-0.790	-0.813	-0.617	-0.774	
Std. skewness error	0.269	0.269	0.269	0.269	0.269	
Kurtosis	-0.474	0.408	0.736	1.17	0.840	
Std. kurtosis error	0.532	0.532	0.532	0.532	0.532	

Descriptive Statistics of Qol

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The descriptive statistics of the Occupational Stress Index (OSI) indicate that the mean OSI score of the sample of 80 seafarers is 128, denoting a high to moderate occupational stress level. Of the 12 OSI subdimensions, Role Overload (Mean = 19.0), Role Conflict (Mean = 14.1), and Unreasonable Group and Political Pressures (Mean = 12.3) had higher mean scores, and this indicates that they are major stresscausing elements in the marine work environment. Conversely, Unprofitability (Mean = 4.66) and Low Status (Mean = 6.05) had comparatively smaller mean values, though Unprofitability had significant skewness (0.996) and kurtosis (1.28) and was indicated to have a positively skewed distribution with clustering towards lower scores and limited outliers rating high stress on this dimension.

Skewness and kurtosis values reveal that several stress variables, including Under participation (Skewness = 1.29), Low Status (0.943), and Role Ambiguity (0.895), are far from normal. This is also evident from the Shapiro-Wilk test, which reveals significant p-values ($p < 0.001$) for the majority of dimensions, establishing that the distribution of many OSI subscales is not normal. Yet, the total OSI score indicates a non-significant Shapiro-Wilk value ($W = 0.985$, $p = 0.449$); hence, total stress scores can be assumed to be approximately normally distributed for further analysis.

For Quality of Life (QOL), the average total score is 101, with Environment (Mean = 31.6) and Physical Health (Mean = 24.6) being the highest of the four WHOQOL-BREF domains, indicating comparatively satisfactory living conditions and physical health among seafarers. Psychological Health (Mean = 23.3) and especially Social Relationships (Mean = 13.2) indicate comparatively lower averages, indicating possible psychosocial vulnerabilities and few interpersonal interactions, perhaps because of isolation during trips. Skewness measures for QOL variables are negative across the board, which suggests left-skewed distributions where more participants had higher quality of life scores. However, the Shapiro-Wilk test identifies substantial departures from normality in Psychological, Social, and Environmental domains ($p < 0.05$). At the same time, the total QOL index is nearly normal, which confirms its application to parametric analysis.

In summary, the descriptive results show seafarers experience significant stress related explicitly to workload, role ambiguity, and social-political pressure onboard. However, they experience a relatively stable physical and environmental quality of life. However, social and psychological well-being seem to be less favourable. These preliminary results correspond with Objective 1 and Objective 2 and set a foundation for further inferential analysis regarding the effect of demographic and occupational variables on stress and quality of life.

Table 3: One-Way ANOVA OSI (Welch's)

Sr. No.	Variable	F	df1	df2	p-value
1	Type of Cargo Ship	0.652	5	28.0	0.663
2	Designation	1.15	9	21.0	0.373
3	Experience	0.827	4	27.2	0.519
4	Home Visit Frequency	1.52	2	45.0	0.230
5	Conflicts at Workplace	0.165	2	48.6	0.848
6	Work Distribution	1.20	2	46.5	0.309
7	Working Conditions	0.262	2	2.77	0.787
8	Bonuses and Incentives	0.605	1	77.9	0.439
9	Promotion Scope	4.02	1	76.5	0.049
10	Salary Satisfaction	3.75	1	76.6	0.057
11	Career Continuation	0.829	1	56.2	0.366

Interpretation of One-Way ANOVA (Welch's) on Occupational Stress Index (OSI):

The Welch's ANOVA was conducted to assess the impact of various demographic and work-related factors on Occupational Stress Index (OSI) among seafarers. The results revealed that most of the tested variables—type of cargo ship ($p = 0.663$), designation ($p = 0.373$), years of experience ($p = 0.519$), frequency of home visits ($p = 0.230$), conflicts at workplace ($p = 0.848$), work distribution ($p = 0.309$), working conditions ($p = 0.787$), bonuses and incentives ($p = 0.439$), and career continuation ($p = 0.366$)— did not exhibit a statistically significant influence on occupational stress, indicating that stress levels remained relatively stable across these subgroups. However, promotion scope ($F = 4.02$, $p = 0.049$) was found to have a statistically significant effect on OSI at the 5% level, suggesting that the availability of promotion opportunities may impact stress perception among seafarers. Salary satisfaction approached significance ($F = 3.75$, $p = 0.057$) and may warrant further exploration. Overall, the findings partially support the rejection of some null hypotheses, specifically H_{012}, while others remain accepted, underlining the selective influence of work-related variables on seafarers' occupational stress levels.

Table 4: Two Way Anova Qol

Anova - qol	Sum of Squares	DF	Mean Square	F	P
Type of Cargo Ship	366.2	5	73.2	0.945	0.458
Promotion Scope	13.6	1	13.6	0.175	0.677
Type of Cargo Ship ✻ Promotion Scope	284.0	5	56.8	0.733	0.601
Residuals	5269.5	68	77.5		

Anova - qol		Sum of Squares	DF	Mean Square	F	P
Overall model		154.3	8	19.29	0.249	0.980
Conflicts at Workplace		18.1	2	9.04	0.114	0.892
Home Visit Frequency		51.0	2	25.52	0.322	0.725
Conflicts at Workplace ✻ Frequency	Home Visit	85.2	4	21.31	0.269	0.897
Residuals		5620.6	71	79.16		

Anova - Qol	Sum of Squares	DF	Mean Square	F	P
Overall model	963	5	192.7	2.10	0.075
Bonuses/Incentives	120	1	119.7	1.75	0.190
Working Conditions	487	2	243.7	3.56	0.033
Bonuses/Incentives ✻ Working Conditions	356	2	178.2	2.60	0.081
Residuals	5061	74	68.4		

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Interpretation of Two-Way ANOVA for Quality of Life (QOL):

To examine how work-related variables and their interactions influence seafarers' Quality of Life (QOL), a series of Two-Way ANOVA tests were conducted, aligned with the study's objectives and hypotheses.

1. Type of Cargo Ship and Promotion Scope Interaction

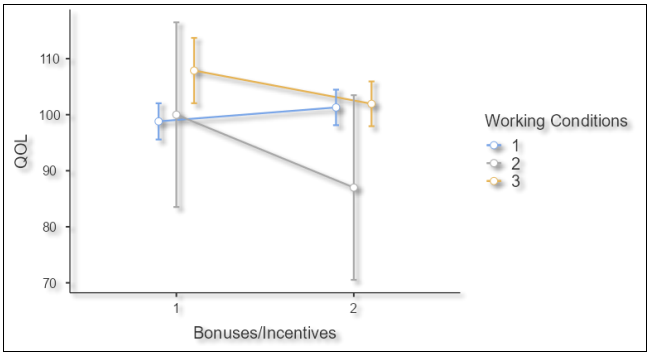
The analysis assessing the main effects of type of cargo ship and promotion scope, as well as their interaction on QOL, revealed no statistically significant results. The type of cargo ship ($F = 0.945$, $p = 0.458$), promotion scope ($F = 0.175$, $p = 0.677$), and their interaction effect ($F = 0.733$, $p = 0.601$) all showed p-values well above the 0.05 threshold. These results lead us to retain the null hypotheses H_{010}, H_{011}, and H_{016}, indicating that neither ship type, promotion opportunities, nor their interaction significantly affect seafarers' quality of life.

2. Conflicts at Workplace and Home Visit Frequency Interaction

Similarly, no significant effects were found when testing conflicts at the workplace ($F = 0.114$, $p = 0.892$), home visit frequency ($F = 0.322$, $p = 0.725$), or their interaction ($F = 0.269$, $p = 0.897$) on QOL. The very high p-values suggest minimal to no variance in QOL attributable to these factors or their combined influence. Thus, hypotheses H_{017} and related nulls remain accepted, indicating that QOL is not significantly impacted by workplace conflict or how often seafarers visit home.

3. Bonuses/Incentives and Working Conditions Interaction

The third Two-Way ANOVA yielded more nuanced findings. While the overall model approached significance ($F = 2.10$, $p = 0.075$), one individual factor—working conditions—showed a statistically significant main effect ($F = 3.56$, $p = 0.033$). This suggests that better or worse working conditions do affect seafarers' perceived quality of life, supporting H_{110} and leading to rejection of the null H_{010}. However, bonuses and incentives did not have a significant independent effect ($F = 1.75$, $p = 0.190$), and the interaction between bonuses/incentives and working conditions was only marginally significant ($F = 2.60$, $p = 0.081$), suggesting a potential but inconclusive interaction effect (H_{115} remains tentative). Across the tested models, only working conditions significantly influenced quality of life, providing empirical support for targeted interventions in improving seafarers' workplace environments. Other demographic and work-related factors, including promotions, bonuses, ship type, and home visits, showed no statistically significant impact, highlighting the robustness of working conditions as a key determinant in occupational well-being.



Graph 1: Interaction Effect of Bonuses/Incentives and Working Conditions on Quality of Life (QOL)

Working Conditions clearly influence QOL (as seen in your ANOVA $p = 0.033$). There's some interaction happening—seen visually, though the $p = 0.081$ isn't quite below 0.05. This suggests: bonuses only help when working conditions are good. If the conditions are poor (like level 2), bonuses may not be enough to boost QOL. Graph 1 depicts the relationship between bonuses/incentives (X-axis: 1 = No bonuses, 2 = Received bonuses) and working conditions (color-coded lines: 1 = Poor, 2 = Moderate, 3 = Good) and the Quality of Life (QOL) of seafarers. The plotted averages indicate that sailors operating under subpar working conditions (line 2 - gray) suffer from significant reductions in QOL upon bonuses being granted, perhaps as indicators of disappointment or unrealized hope in otherwise unfavorable situations. Compared to that, good (line 3 - orange) and medium (line 1 - blue) working conditions workers possess fairly constant or bettered scores of QOL when bonuses are introduced. Although the interaction effect was not statistically significant at 5% ($p = 0.081$), the difference in slopes—especially the steep decline of QOL for poor working conditions with bonuses—suggests a possible conditional relationship, whereby monetary incentives' influence on well-being is conditioned by the quality of the working environment. This figure demonstrates the proposition that bonuses per se cannot make up for poor working conditions, buttressing the argument that working conditions should be improved in tandem with monetary incentives to increase overall QOL.

Findings

- **Work as a Social Structure:** Seafaring operates within a rigid hierarchical structure where power relations, authority, and limited autonomy contribute to occupational stress and feelings of alienation.
- **Isolation and Social Disconnection:** Prolonged periods away from family and limited onboard social interaction weaken social bonds, leading to loneliness and reduced psychological well-being.

- **Human Rights and Work Conditions:** Inequalities in working conditions, promotion opportunities, and access to welfare reflect broader issues of labor rights and social justice within the maritime industry.

- **Role Conflict and Organizational Pressure:** Conflicting job expectations and unclear role boundaries create tension between individual agency and institutional control, affecting job satisfaction and quality of life.

- **Impact on Quality of Life:** While physical and environmental well-being remain stable due to regulated safety standards, social and psychological domains show decline, revealing the human cost of industrial labor at sea.

- **Cultural and Social Capital:** Seafarers with stronger peer networks and supportive relationships demonstrate better coping mechanisms, emphasizing the role of social support in managing occupational stress.

- **Gendered and Structural Dimensions:** The male-dominated nature of maritime work reinforces traditional gender norms and limits emotional expression, further heightening psychosocial strain.

- **Institutional Implications:** The findings highlight the need for organizational reforms, welfare mechanisms, and policy frameworks that treat mental health, dignity, and fair treatment as core sociological and human rights concerns.

Conclusion

This research investigated the multifaceted interaction between occupational stress and quality of life (QOL) among seafarers, incorporating demographic and job-related variables along with sophisticated statistical methods to identify concealed dimensions of stress. The results confirmed a strong negative relationship between OSI and QOL, validating the main hypothesis (H_{11}) and underscoring those greater levels of stress lower satisfaction with life. Most demographic variables, including experience and birth order, did not significantly affect stress or QOL, indicating that these factors might not require specific interventions. However, occupational variables such as workplace conflicts, opportunities for promotion, bonuses, and working conditions did influence stress or QOL, with opportunities for promotion and bonuses showing an inverse relationship with stress. One notable finding from the Exploratory Factor Analysis was the identification of three latent dimensions of stress—Perceived Role Deficiency, Organizational Strain, and Psychosocial Alienation—supporting H_{118} and providing better insights into stressors faced by seafarers. The results emphasize the need to enhance organizational support, reduce role ambiguity, manage workloads, and foster peer relationships. In conclusion, the research meets its objectives and offers an evidence-based foundation for developing targeted mental health and occupational wellbeing interventions tailored to the unique challenges of the shipping career.

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