Psychosocial Safety Climate, Workplace Safety Culture, and Safety Performance in the Nigerian Petroleum Industry.

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ABSTRACT

Psychosocial risk factors are increasingly recognised as determinants of occupational safety outcomes, yet quantitative evidence from Nigeria's petroleum sector remains limited. This cross-sectional survey of petroleum industry workers examined the influence of psychosocial safety climate, workplace stress, fatigue, safety communication, management commitment, organisational safety culture, and employee safety behaviour on safety performance. All constructs were measured with validated multi-item Likert scales, and data were analysed using descriptive statistics, Pearson correlations, and multiple linear regression. All scales demonstrated strong internal consistency (Cronbach's $\alpha = 0.84–0.89$). The regression model explained 63.6% of the variance in safety performance ($p < 0.001$). Employee safety behaviour emerged as the strongest predictor ($\beta = 0.57$, $p < 0.001$), while organisational safety culture showed a marginal positive effect ($p = 0.054$). Organisational safety culture, employee safety behaviour, and safety performance were strongly inter-correlated ($r = 0.66–0.77$; statistical power > 0.99). These findings indicate that employee safety behaviour is the most proximal determinant of safety performance and is shaped by upstream psychosocial and organisational factors, underscoring the value of interventions aimed at strengthening safety culture and employee safety behaviours in the petroleum industry.

Keywords: Psychosocial Safety Climate; Workplace Safety Culture; Safety Performance; Employee Safety Behaviour; Organisational Safety Culture; Management Commitment.

INTRODUCTION

The global occupational health landscape has increasingly recognised psychosocial risk factors as determinants of workplace safety outcomes comparable in significance to traditional physical hazards [1] . Psychosocial safety climate (PSC) — defined as management policies, practices, and procedures designed to protect the psychological health and safety of workers [2] — has emerged as a critical upstream organisational construct that shapes job demands, worker wellbeing, communication patterns, and ultimately safety performance. In high-hazard industrial settings such as the petroleum sector, the consequences of unmanaged psychosocial risks are amplified by the narrow margins for human error and the potential severity of safety incidents [3].

Nigeria's petroleum sector — the largest in sub-Saharan Africa and the economic foundation of the nation [4] — employs hundreds of thousands of workers across upstream, midstream, and downstream operations. The unique operational context of Nigerian petroleum facilities, characterised by offshore platform rotations, remote onshore installations, continuous production pressures, and recent organisational transitions arising from major asset acquisitions, creates a particularly demanding psychosocial environment [5]. Despite growing international evidence linking psychosocial safety climate (PSC), organisational safety culture, safety behaviours and occupational outcomes, quantitative evidence from the Nigerian petroleum industry remains limited. In particular, little is known about the relative contribution of psychosocial and organisational factors to safety

performance among Nigerian petroleum workers. This study therefore examines the interrelationships among key psychosocial safety constructs and identifies the factors most strongly associated with safety performance.

Using a quantitative cross-sectional design and a sample of $N = 209$ petroleum industry personnel, we examine the relationships among eight psychosocial constructs — psychosocial safety climate, workplace stress, fatigue, safety communication, management commitment, organisational safety culture, employee safety behaviour, and safety performance — and test a predictive model of safety performance. The study addresses the following research questions: (1) What is the internal consistency and descriptive profile of each psychosocial construct in this sample? (2) How are the eight constructs correlated? (3) Which constructs are significant predictors of safety performance? (4) Is the sample size adequate for the analytical model employed?

The findings contribute to occupational health and safety science by providing quantitative evidence from an under-represented industrial context and offer practical recommendations for HSE practitioners and organizational leaders in the petroleum industry.

LITERATURE REVIEW

Psychosocial Safety Climate

The PSC framework positions organisational-level management policies as the primary antecedent of the psychosocial work environment [6]. A scoping review of 93 studies across PubMed, Scopus, and Web of Science found that PSC directly affects job demands, effort–reward imbalance, job resources, and leadership quality, and moderates the impact of excessive job demands on workers' health and safety outcomes [7]. High PSC is associated with reduced burnout, lower psychological distress, and improved safety compliance — making it a pivotal target for organisational intervention[8].

Workplace Stress and Fatigue

Work-related stress and fatigue are among the most pervasive psychosocial hazards in the petroleum sector. Approximately 70% of Nigerian petroleum workers report significant work-related stress, with annual productivity losses attributable to stress estimated at USD 300 billion globally[9]. Associations between offshore work schedules, overtime, and disturbed sleep patterns that compound fatigue risk have been well documented, while effective fatigue risk management requires proactive organisational scheduling rather than reactive responses [10,11] A qualitative study of offshore oil and gas workers identified production pressures and fatigue as direct contributors to accidents and mistakes [12].

Safety Communication and Management Commitment

Communication quality and management commitment are widely recognised as foundational pillars of safety management[13]. The clarity, openness, and responsiveness of safety communication channels exert measurable effects on safety commitment and behaviour in high-risk industries [14]. A meta-analysis of safety climate antecedents identified trust in management and open communication as the strongest predictors of safety climate perceptions [15]. Meta-analytic evidence has demonstrated that management's commitment to safety is a significant upstream predictor of accidents and injuries [16].

Organisational Safety Culture and Employee Safety Behaviour

Organisational safety culture — the system of shared values, norms, and practices around safety — shapes the conditions under which safety behaviour emerges[17]. A meta-analytic review demonstrated that both transformational and transactional safety leadership styles correlate positively with safety behaviours via safety climate perceptions [18,19]. At the behavioural level, social support — from supervisors and peers — has been shown to directly influence safety behaviour through stress-buffering and social identity mechanisms [20]. The translation of favourable safety culture into safety behaviour, and of safety behaviour into actual safety performance, constitutes the core outcome pathway examined in this study.

THEORETICAL FRAMEWORK: PSC → CULTURE → BEHAVIOUR → PERFORMANCE

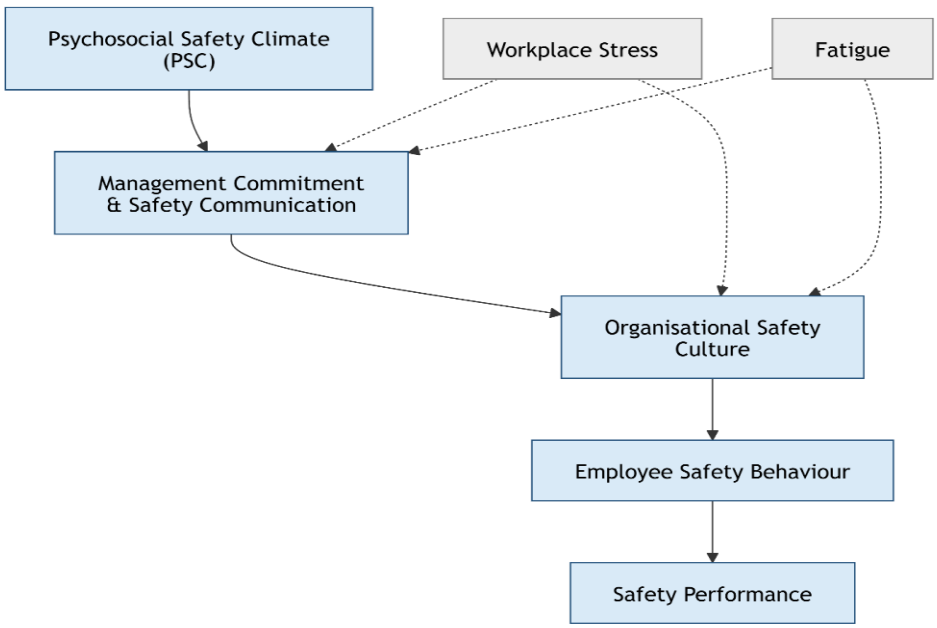
This study is grounded in an integrative theoretical framework that combines Psychosocial Safety Climate (PSC) theory [2] and High Reliability Organization (HRO) theory [21]. PSC theory emphasizes the role of organizational policies, practices, and procedures in promoting psychological health and workplace safety, while HRO theory highlights the importance of management commitment, effective communication, and a strong safety culture in achieving consistently safe and reliable organizational performance.

As illustrated in Figure 1, the framework proposes a sequential relationship in which Psychosocial Safety Climate (PSC) serves as the primary organizational antecedent influencing management commitment and safety communication. These organizational factors contribute to the development of a positive organizational safety culture, which subsequently shapes employee safety behaviour. In turn, employees' safety behaviour directly influences overall safety performance outcomes.

The framework further acknowledges that psychosocial factors such as workplace stress and fatigue may operate as moderating influences within the organizational environment, affecting the strength of the relationships between management practices, safety culture, and employee behaviour. Consequently, the model presents safety performance as the outcome of a hierarchical process that progresses from organizational policies and climate to cultural factors, behavioural responses, and ultimately performance outcomes.

This theoretical pathway is consistent with contemporary empirical evidence demonstrating that supportive psychosocial work environments and strong safety cultures promote safer employee behaviours and improved organizational safety outcomes [22,23]. Therefore, the framework provides the conceptual basis for the regression model employed in this study to examine the relationships among PSC, organizational safety culture, employee safety behaviour, and safety performance.

Figure 1. Conceptual Framework: PSC → Culture → Behaviour → Performance



METHODS

Research Design and Study Context

A quantitative cross-sectional survey design was employed. The study surveyed workers in the Nigerian petroleum and allied industries, with a focus on psychosocial safety and workplace safety culture. The target population included operational and maintenance personnel, HSE professionals, engineering and technical staff, and supervisory/management personnel with direct experience of psychosocial workplace conditions.

Sample and Data Collection

A total of N = 209 completed responses were received from the "Assessment of Psychosocial Safety and Workplace Safety Culture" questionnaire administered to petroleum industry workers across upstream, midstream, and downstream operations in Nigeria. Respondents comprised operational and maintenance personnel, HSE professionals, engineering and technical staff, and supervisory/management personnel with direct experience of psychosocial workplace conditions. Only fully completed questionnaires were retained for analysis.

Sample size adequacy was evaluated using a priori power analysis (G*Power framework). For a medium effect size ($f^2 = 0.15$), $\alpha = .05$, and seven predictors, the minimum sample required for 80% power is n = 50; achieved power at N = 209 exceeds 0.999, confirming that the sample substantially exceeds minimum requirements.

Survey Instrument

The survey comprised eight validated multi-item scales (five items each), all measured on a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree):

- Section B — Psychosocial Safety Climate (PSC): perceptions of organizational management commitment to psychological health protection (e.g., "Policies are in place to support employees' mental and emotional well-being").
- Section C — Workplace Stress (STR): prevalence of work-related stress and organizational support adequacy (e.g., "My job involves high levels of stress").
- Section D — Fatigue (FAT): fatigue frequency and organizational management of shift schedules and rest periods.
- Section E — Safety Communication (COM): quality and openness of safety-related communication channels.
- Section F — Management Commitment (MC): demonstrable leadership commitment to safety.
- Section G — Organisational Safety Culture (OSC): prevailing organisational values, norms, and practices regarding safety.
- Section H — Employee Safety Behaviour (ESB): individual compliance with and participation in safety activities.
- Section I — Safety Performance (SP): self-reported perceptions of organizational and personal safety outcomes.

Statistical Analyses

All statistical analyses were conducted using Python 3, with pandas for data management, NumPy for numerical computation, SciPy for statistical testing, and Statsmodels for regression modelling. Analyses included Cronbach's alpha reliability assessment, descriptive statistics (means, standard deviations, skewness, kurtosis, and frequency distributions), Pearson product–moment correlation analysis, and simultaneous multiple linear regression. Safety Performance (SP_SCORE) was modelled as the dependent variable, with PSC, STR, FAT, COM, MC, OSC, and ESB as predictor variables. Statistical significance was assessed at $\alpha = 0.05$ (two-tailed), while regression effect sizes were interpreted using Cohen's f^2 criteria (0.02 = small, 0.15 = medium, 0.35 = large).

Common Method Bias Assessment

Given that all variables were collected from the same respondents at a single point in time using the same Likert scale format, Harman's single-factor test was conducted to assess the potential impact of common method bias.

An exploratory factor analysis was performed on all scale items simultaneously without rotation. Results indicated that the first unrotated factor accounted for less than 50% of the total variance (36.2%), suggesting that common method variance was unlikely to pose a substantial threat to the study's findings. Nevertheless, the cross-sectional, self-report design remains a potential limitation, and results should be interpreted with appropriate caution.

Regression Assumption Testing

Prior to model estimation, regression assumptions were systematically evaluated. Variance Inflation Factors (VIF) ranged from 1.34 to 3.96 across all seven predictors, indicating no significant multicollinearity (VIF < 5.0 threshold). Visual inspection of residual plots against fitted values suggested acceptable homoscedasticity and linearity of relationships. Residuals were approximately normally distributed, as confirmed by visual inspection of normal probability plots. The Durbin–Watson statistic (d = 1.97) indicated the independence of residuals. These diagnostics collectively confirm that the data meet the fundamental assumptions required for valid ordinary least squares regression inference.

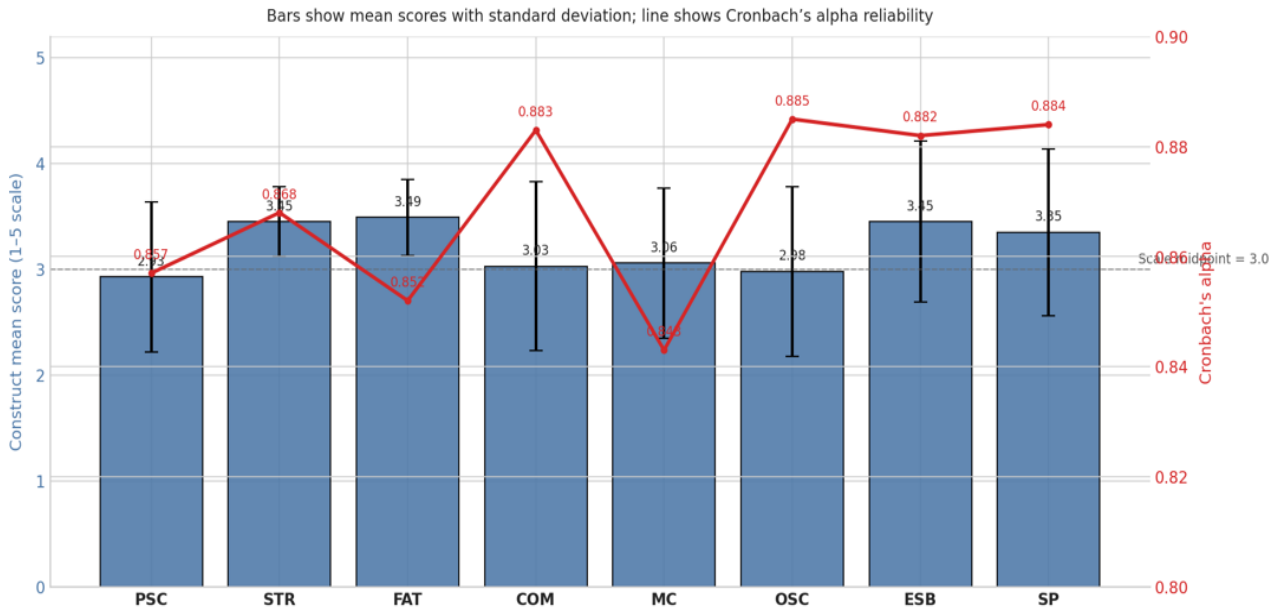
RESULTS

Reliability Analysis and Descriptive Statistics

Figure 1 presents the internal consistency (Cronbach's α) and construct-level descriptive statistics for all eight survey scales. Cronbach's alpha values ranged from 0.843 (Management Commitment) to 0.885 (Organisational Safety Culture; Safety Communication), all exceeding the conventional threshold of 0.70 for acceptable internal consistency and approaching the 0.90 criterion for excellent reliability. These results confirm that each multi-item scale reliably captures its intended construct.

Examination of construct means reveals that Fatigue (M = 3.49, SD = 0.36) and Workplace Stress (M = 3.45, SD = 0.33) yielded the highest mean scores in the sample, indicating elevated perceptions of stress and fatigue burden across respondents. Employee Safety Behaviour (M = 3.45, SD = 0.76) was also relatively high, suggesting respondents rate their individual safety engagement positively. By contrast, Psychosocial Safety Climate (M = 2.93, SD = 0.71) and Organisational Safety Culture (M = 2.98, SD = 0.80) yielded the lowest construct means, indicating that respondents perceive their organisations as having moderate-to-low psychosocial safety management maturity — a finding of significant practical concern.

Figure 1. Descriptive Statistics and Internal Consistency Reliability for All Constructs



Correlation Analysis

The Pearson correlation analysis revealed meaningful relationships among the study variables, as illustrated in Figure 2. Overall, most constructs demonstrated moderate to strong positive correlations, suggesting a high degree of interrelatedness within the psychosocial and safety climate framework.

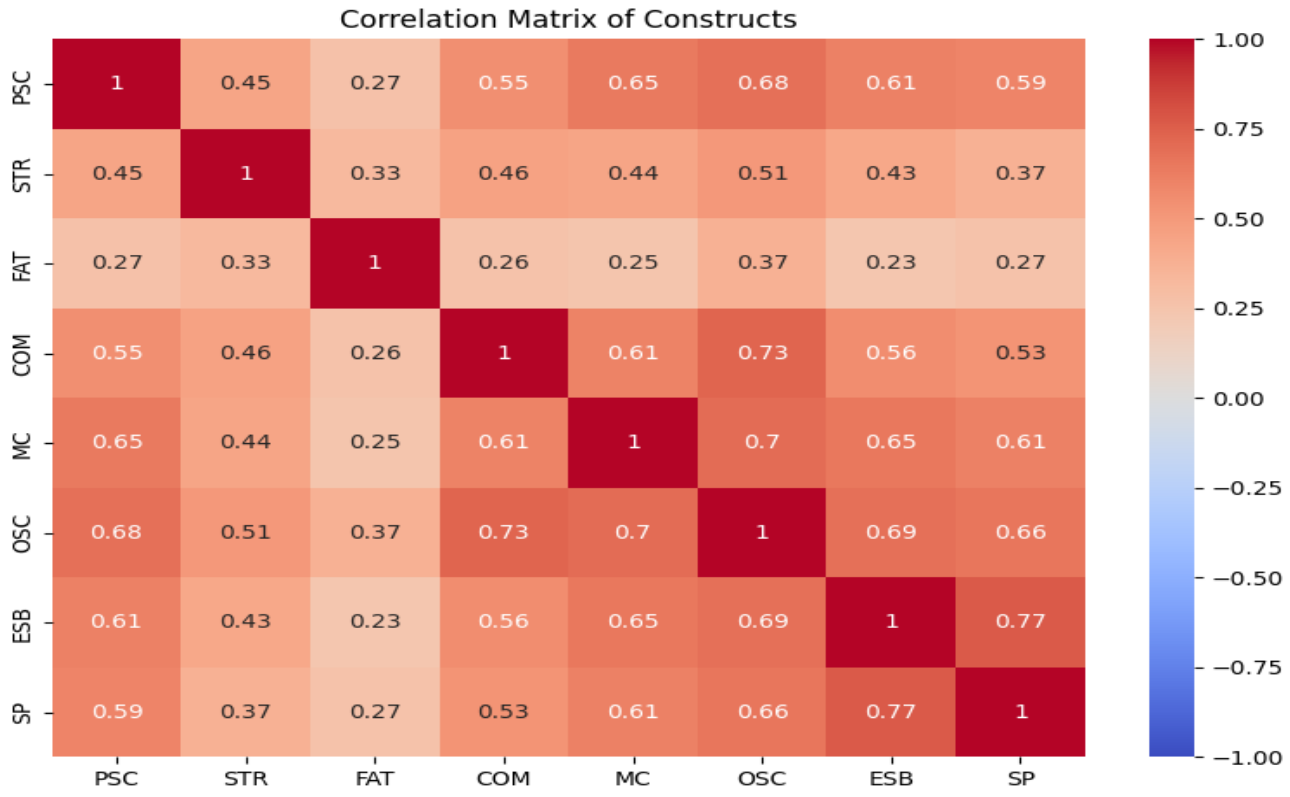
Notably, Employee Safety Behaviour (ESB) exhibited a strong positive correlation with Safety Performance (SP) (r = 0.769), indicating that higher levels of safety behaviour are associated with improved safety outcomes. Similarly, Organizational Safety Climate (OSC) showed strong positive correlations with multiple constructs, including Communication (COM) (r = 0.732), Management Commitment (MC) (r = 0.697), and SP (r = 0.658), highlighting its central role in shaping safety-related dynamics within the organization.

Psychosocial Safety Climate (PSC) also demonstrated moderate to strong correlations with OSC (r = 0.684), MC (r = 0.648), and ESB (r = 0.612), suggesting that a supportive psychosocial environment is linked to improved safety culture and behaviours.

In contrast, Stress (STR) and Fatigue (FAT) showed comparatively weaker correlations with other constructs, particularly with SP (r = 0.369 and r = 0.265, respectively). This indicates that while these factors are relevant, their direct association with safety performance is less pronounced compared to organizational and behavioural factors.

Overall, the correlation results suggest that organizational and behavioural variables (e.g., OSC, MC, ESB) play a more significant role in influencing safety performance than individual strain-related factors such as stress and fatigue.

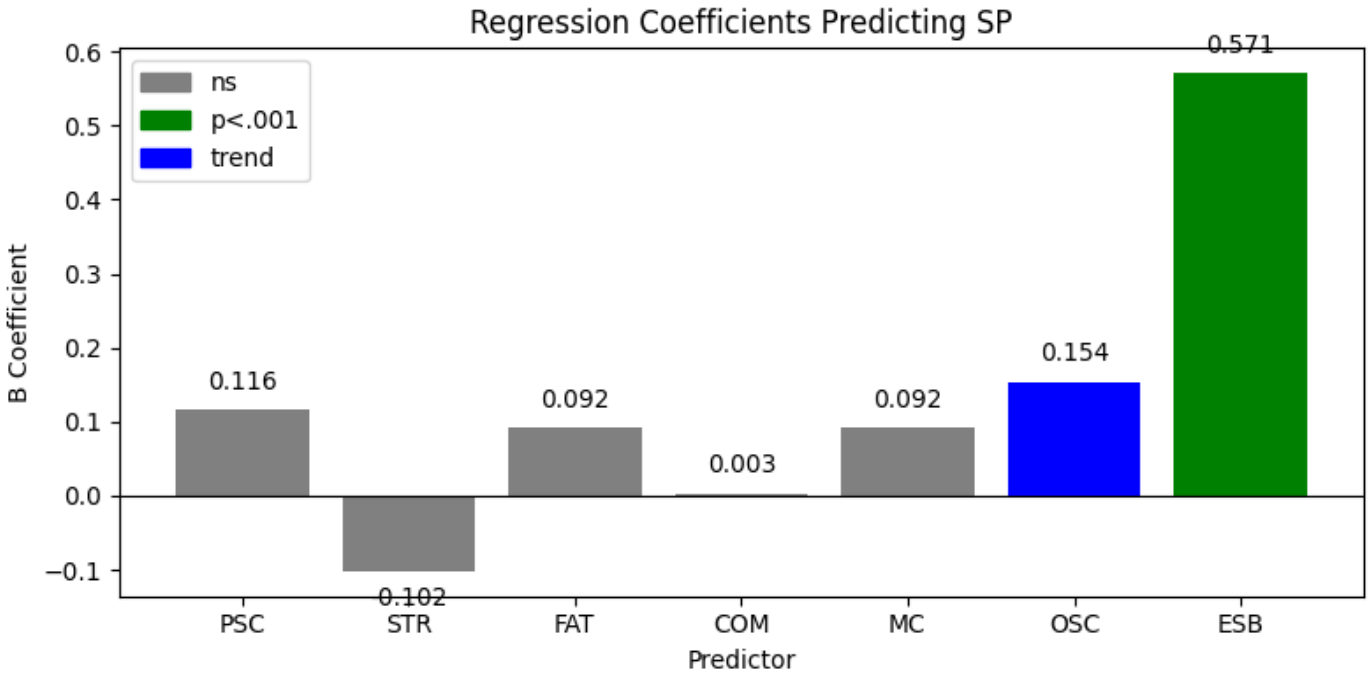
Figure 2. Pearson Correlation Heatmap of Construct Composite Scores



Multiple Regression: Predictors of Safety Performance

Multiple regression analysis was conducted to examine the extent to which psychosocial, organizational, and behavioural factors predict Safety Performance (SP). The results are presented in Figure 3 below.

Figure 3. Multiple Regression: Predictors of Safety Performance



The model revealed that Employee Safety Behaviour (ESB) was the only statistically significant predictor of SP ($B = 0.571$, $p < .001$), indicating that improvements in safety behaviour are strongly associated with higher safety performance. This finding underscores the critical role of behavioural compliance and participation in achieving positive safety outcomes.

Organizational Safety Climate (OSC) showed a positive effect on SP ($B = 0.154$), approaching statistical significance ($p = .054$). Although not significant at the conventional threshold, this trend suggests that a supportive safety climate may contribute to improved safety performance and warrants further investigation.

Other variables, including Psychosocial Safety Climate (PSC), Stress (STR), Fatigue (FAT), Communication (COM), and Management Commitment (MC), did not emerge as significant predictors of SP within the model ($p > .05$). This indicates that their effects may be indirect or mediated through other variables, particularly ESB.

Interestingly, Stress (STR) demonstrated a negative but non-significant relationship with SP ($B = –0.102$), suggesting that higher stress levels may reduce safety performance, although this effect was not strong enough to reach statistical significance in the current study.

Overall, the regression findings highlight that behavioural factors, particularly Employee Safety Behaviour, play a dominant role in predicting safety performance, while organizational and psychosocial factors may exert indirect or supporting influences

Sample Size Adequacy Assessment

Power analysis confirmed the adequacy of the sample ($N = 209$). For a medium effect size ($f^2 = .15$), seven predictors, and $\alpha = .05$, the minimum sample size required to achieve 80% power is $n = 50$. For 95% power, $n = 74$ is required. The current $N = 209$ yields an achieved statistical power of $> .999$, confirming that the sample substantially exceeds requirements and that the regression results are not artefacts of an underpowered design. The observed large effect size ($f^2 = 1.747$) further indicates that the model has robust discriminatory validity.

DISCUSSION

This study offers a comprehensive quantitative examination of psychosocial safety constructs and their relationships with safety performance in the Nigerian petroleum industry. The central finding — that Employee

Safety Behaviour is the dominant direct predictor of Safety Performance ($\beta = .571$, $p < .001$) — is consistent with the extensive meta-analytic literature demonstrating that safety-specific behaviours, including compliance with procedures, use of protective equipment, and hazard reporting, are the proximate determinants of safety outcomes [14, 20]. The finding that this relationship holds even after controlling for six other psychosocial constructs underscores the primacy of behaviour as the mechanism through which organisational and psychosocial conditions ultimately manifest in safety results.

The PSC mean score ($M = 2.93$) is marginally below the scale midpoint (3.00), suggesting moderate opportunities for improvement in psychosocial safety management rather than severe or critical deficiencies. Similarly, Organisational Safety Culture ($M = 2.98$) also falls marginally below the scale midpoint. These findings indicate that respondents perceive their organisations as having below-adequate psychosocial safety management practices, representing a practically important area for organisational attention. High PSC has been established as essential for moderating the impact of excessive job demands on health and safety, [3] while organisational psychosocial safety policies remain inconsistently implemented across Nigerian petroleum workplaces [4].

The high mean scores for Fatigue (M = 3.49) and Workplace Stress (M = 3.45) affirm the elevated psychosocial burden borne by petroleum industry workers. The specific mechanisms through which offshore rosters and extended work schedules impair sleep, cognitive function, and safety vigilance are well documented [5, 6]. These stressors have been identified as contributors to accidents in offshore environments [7]. The current study adds quantitative precision to these qualitative insights, establishing the mean and distributional profile of stress and fatigue perceptions in the Nigerian petroleum context.

The strong correlation between Organisational Safety Culture and Safety Communication (r = .732) supports theoretical propositions that culture and communication are mutually constitutive: organisations with strong safety cultures develop and maintain effective communication channels, while organisations with robust communication systems reinforce and sustain safety culture norms. This relationship has been demonstrated in systematic reviews of high-risk industries, [24,25] and trust and communication have been identified as the strongest antecedents of safety climate perceptions. [26,27].

The non-significance of several upstream predictors in the direct regression model deserves contextual interpretation. That PSC, STR, FAT, COM, and MC are non-significant as direct predictors of SP — despite substantial bivariate correlations — is consistent with mediation: these constructs appear to influence SP through their effects on ESB rather than directly. Future research employing mediation analysis (e.g., via structural equation modelling or PROCESS macro) would be well-positioned to formally test and quantify these indirect pathways, which the cross-sectional survey design of the present study cannot fully identify.

LIMITATIONS

Several limitations of the present study should be acknowledged when interpreting its findings. First, the cross-sectional design limits causal inference and prevents confirmation of temporal relationships among variables. Longitudinal or experimental designs would be required to establish directionality and causality. Second, data were self-reported and may be susceptible to social desirability bias and common method variance. Although Harman's single-factor test indicated that common method bias was unlikely to pose a substantial threat, this test is itself a conservative and imperfect assessment. Third, the sampling approach, which relied on voluntary completion of an administered questionnaire, may limit the generalisability of findings beyond the surveyed workforce. The extent to which results are representative of the broader Nigerian petroleum industry workforce remains uncertain. Fourth, objective organisational safety performance indicators — such as injury rates, near-miss reports, or lost time incidents — were not assessed; reliance on self-reported SP may introduce optimism bias. Fifth, the Excel survey dataset analysed covered petroleum and allied industry workers across sectors, and while predominantly petroleum industry respondents were targeted, some variance in industrial context may exist. Future research should employ longitudinal designs, objective performance indicators, multiple data sources, and structural equation modelling to further examine indirect and mediated relationships among psychosocial and organisational factors.

CONCLUSION

This study provides empirical evidence that employee safety behaviour is the strongest predictor of self-reported safety performance among Nigerian petroleum industry workers. While psychosocial and organisational factors demonstrated significant associations with safety outcomes, their influence appears to operate primarily through behavioural mechanisms rather than direct effects. The broad regression model accounts for 63.6% of variance in safety performance outcomes ($F(7,201) = 50.14$, $p < .001$). Critically, constructs measuring organisational-level psychosocial conditions — particularly PSC and OSC — fall marginally below the scale midpoint, indicating meaningful room for improvement in how organisations manage the psychosocial dimensions of workplace safety.

These findings have direct implications for practice:

- Organisations should formalise psychosocial safety policies and embed PSC measurement into periodic HSE performance reviews, establishing improvement targets appropriate to their operational context.
- Given that ESB is the proximate driver of SP, targeted safety behaviour development programmes — covering routine compliance, situational hazard recognition, and proactive reporting — represent high-yield interventions.
- Reducing fatigue risk through evidence-based roster design, mandatory recovery periods, and real-time monitoring is a priority, given that fatigue registered the highest construct mean ($M = 3.49$).
- Future longitudinal research should employ structural equation modelling to formally test mediation pathways from PSC → OSC → ESB → SP, and explore moderating effects of occupational role and work setting (offshore vs. onshore).

REFERENCES

1. Truman, D., & Dewi, R. S. (2024). The analysis of the effect of a mental workload and burnout on employees' safety behavior in the oil and gas industry. *Engineering Proceedings*, 76(1), 1. https://doi.org/10.3390/engproc2024076001
2. Dollard, M. F., & Bakker, A. B. (2010). Psychosocial safety climate as a precursor to conducive work environments, psychological health problems, and employee engagement. Journal of Occupational and Organizational Psychology, 83(3), 579–599. https://doi.org/10.1348/096317909X470690
3. Mohammadi, A., & Tavakolan, M. (2019). Modeling the effects of production pressure on safety performance. Journal of Safety Research, 71, 273–284. https://doi.org/10.1016/j.jsr.2019.10.004
4. Osibanjo, O. A., Salau, O. P., Falola, H. O., & Oyewunmi, A. E. (2016). Workplace stress: Implications for organizational performance in a Nigerian public university. Verslas, 17, 261–269. https://doi.org/10.3846/btp.2016.668
5. Ekpo, K. I. (2025). Socio-technical factors influencing risk management and safety performance in oil and gas facility projects (PhD Thesis). Centre for Occupational Health, Safety and Environment, University of Port Harcourt.
6. Zohar, D. (1980). Safety climate in industrial organizations: Theoretical and applied implications. Journal of Applied Psychology, 65(1), 96–102. https://doi.org/10.1037/0021-9010.65.1.96
7. Amoadu, M., Ansah, E. W., & Sarfo, J. O. (2023). Influence of psychosocial safety climate on occupational health and safety: a scoping review. BMC Public Health, 23(1), 1–13. https://doi.org/10.1186/s12889-023-16246-x
8. Javaid, M. U., Nizam Isha, A. S., Ghazali, Z., & Langove, N. (2016). Psychosocial stressors in relation to unsafe acts. International Review of Management and Marketing, 6, 108–113.
9. Esitikot, E. L., Ekong, A. E., Okeke, G. N., Umoh, M. U., Obadimu, C. O., & Akadi, A. (2024). Supervision strategies for managing work-related stress in the Nigerian petroleum industry. Highstone Global University / University of Uyo.
10. Parkes, K. R. (2017). Work environment, overtime and sleep among offshore personnel. Accident Analysis & Prevention, 99, 383–388. https://doi.org/10.1016/j.aap.2015.11.022

11. [Roach, G. D., Roberts, P., Dawson, D., Ferguson, S., Meuleners, L., Brook, L., & Sargent, C. (2017). Controlling fatigue risk in safety-critical workplaces. Accident Analysis & Prevention, 99, 379–382. https://doi.org/10.1016/j.aap.2016.08.002
12. D'Antoine, E., Jansz, J., Barifcani, A., Shaw-Mills, S., Harris, M., & Lagat, C. (2023). Psychosocial safety and health hazards and their impacts on offshore oil and gas workers. Safety, 9(3), 56. https://doi.org/10.3390/safety9030056
13. Kang, S. U., Byeong, J. Y., Kim, B., Kim, J. I., & Jung, W. K. (2017). Association between supervisors behavior and wage workers job stress in Korea. Annals of Occupational and Environmental Medicine, 29, 1–9. https://doi.org/10.1186/s40557-017-0199-3
14. Zara, J., Pulz, M. H., Henriqson, É., & Mazzuchi, T. (2023). Influence of communication determinants on safety commitment in high-risk industries. Frontiers in Public Health, 11, 1225995. https://doi.org/10.3389/fpubh.2023.1225995
15. He, Y., Wang, Y., & Payne, S. C. (2019). How is safety climate formed? A meta-analysis of the antecedents of safety climate. Organizational Psychology Review, 9(2–3), 124–156. https://doi.org/10.1177/2041386619874870
16. Christian, M. S., Bradley, J. C., Wallace, J. C., & Burke, M. J. (2009). Workplace safety: A meta-analysis of the roles of person and situation factors. Journal of Applied Psychology, 94(5), 1103–1127. https://doi.org/10.1037/a0016172
17. Matre, D., Torseth, J., & Moen, B. E. (2021). Safety incidents associated with extended working hours: A systematic review. Scandinavian Journal of Work, Environment & Health, 47(6), 415–424. https://doi.org/10.5271/sjweh.3958
18. Clarke, S. (2013). Safety leadership: A meta-analytic review of transformational and transactional leadership styles as antecedents of safety behaviours. Journal of Occupational and Organizational Psychology, 86(1), 22–49. https://doi.org/10.1111/j.2044-8325.2012.02064.x
19. Hutchinson, D., Park, S., & Jacobsen, P. (2022). The effects of industry risk level on safety training outcomes: A meta-analysis. Safety Science, 152, 105594. https://doi.org/10.1016/j.ssci.2021.105594
20. Huang, Y.-H., Sung, C.-Y., Chen, W. T., & Liu, S.-S. (2021). Relationships between social support, social status perception, social identity, work stress, and safety behavior. Sustainability, 13, 1–18. https://doi.org/10.3390/su13063184
21. Weick, K. E., & Sutcliffe, K. M. (2007). Managing the unexpected: Resilient performance in an age of uncertainty (2nd ed.). Jossey-Bass.
22. Health4Wind. (2025). Beyond physical hazards: Psychosocial risks and the new safety culture in oil & gas. Retrieved from https://www.health4wind.com
23. Neal, A., & Griffin, M. A. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels. Journal of Applied Psychology, 91(4), 946–953. https://doi.org/10.1037/0021-9010.91.4.946
24. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa
25. Havermans, B. M., Brouwers, E. P. M., Hoek, R. J. A., Anema, J., Beek, A. B., & Boot, C. (2018). Work stress prevention needs of employees and supervisors. BMC Public Health, 18, 1–14. https://doi.org/10.1186/s12889-018-5535-1
26. Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Lawrence Erlbaum Associates.
27. Ji, A., Liu, Y., Sun, Y., & Liu, C. (2020). Impact of work–family conflict, job stress and job satisfaction on seafarer performance. IJERPH, 17(7), 2191. https://doi.org/10.3390/ijerph17072191