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Synergy of Competence and Mental Well-being in Achieving Offshore Fleet Operational Targets: The Mediating Role of Organizational Commitment

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Abstract

This study explores the critical synergy between technical competence and mental well-being in driving the operational success of offshore maritime fleets. Amidst a recorded decline in performance targets at SKOM Sdn. Bhd. (SK Offshore & Marine) from 2021 to 2023, this research identifies the underlying factors influencing ship crew productivity. Using a quantitative confirmatory design, data were collected from 213 crew members across 10 offshore vessels and analyzed through Structural Equation Modeling (SEM). The findings demonstrate that while technical training and the implementation of the International Safety Management (ISM) Code directly enhance operational execution, their long-term impact is heavily dependent on the psychological state of the crew. Job stress was found to significantly undermine both performance and organizational attachment. Crucially, the study reveals that organizational commitment acts as a vital bridge; it translates training and safety protocols into sustained high performance while mitigating the negative effects of occupational stress. These results suggest that achieving offshore operational targets requires more than just procedural compliance; it demands an integrated management approach that prioritizes mental health support alongside technical development. The study provides strategic recommendations for maritime managers to balance workload distribution and strengthen crew commitment to ensure operational reliability in high-risk environments.

Keywords: competence synergy; mental well-being; offshore operations; organizational commitment; ship crew performance; ISM Code

1. Introduction

The maritime industry is the backbone of global trade and offshore energy production, operating within a high-risk environment where human reliability is the ultimate safeguard against operational failure. In the offshore sector, ship crew performance is not merely an indicator of productivity; it is a critical determinant of safety, environmental protection, and organizational sustainability. For companies like SKOM Sdn. Bhd. (SK Offshore & Marine) in Malaysia, achieving peak performance is an ongoing challenge. Recent organizational data reveals a concerning trend: a steady decline in performance realization from 94% in 2021 to 89% in 2022 and further dropping to 85% in 2023. This widening gap between targets and actual outcomes suggests that traditional approaches to maritime management may be insufficient in addressing the complexities of modern offshore operations (Amrullah et al., 2021; Pandya et al., 2021; Tikas, 2024).

At the core of this performance challenge lies the need for a synergy between technical competence and the mental well-being of the crew. Technical competence is largely driven by structured training programs and the rigorous implementation of the International Safety Management (ISM) Code. Training serves as the primary mechanism for skill acquisition, emergency preparedness, and the synchronization of crew actions with sophisticated shipboard technology. However, the maritime literature shows inconsistent results regarding the direct impact of training on performance, suggesting that technical knowledge alone does not guarantee superior execution unless it is internalized through organizational commitment (Fitriyah et al., 2021). Simultaneously, the ISM Code provides the mandatory regulatory framework designed to minimize human error. When safety management systems are deeply embedded in shipboard culture, they provide the procedural clarity and discipline necessary for high-stakes decision-making.

However, even the most technically competent and well-regulated crew can falter if their mental well-being is compromised. The offshore environment is inherently taxing, characterized by prolonged

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isolation, physical fatigue, harsh weather conditions, and the immense psychological pressure of being responsible for multi-million-dollar assets. Job stress, therefore, emerges as a "silent determinant" of performance. While manageable stress can occasionally sharpen focus, chronic occupational stress often leads to burnout, reduced concentration, and a breakdown in communication—factors that directly undermine the safety and efficiency of the vessel (Titin et al., 2022; Wibowo et al., 2021). The maritime sector has historically prioritized technical compliance over psychological health, but the declining performance at SKOM Sdn. Bhd. highlights the urgent need to treat mental well-being as a strategic operational asset.

The bridge between these technical and psychological factors is organizational commitment. Commitment represents the emotional and professional attachment of the crew to the organization's objectives. In an offshore setting, where supervision is limited and autonomy is high, a committed crew is more likely to adhere to safety protocols and maintain high standards of performance even in the absence of direct oversight (Marrucci et al., 2021). Commitment acts as a mediator; it is the internal engine that translates training and safety systems into meaningful actions, while also acting as a buffer against the de-motivating effects of job stress. When a crew feels valued and professionally supported, their commitment increases, which in turn drives them to overcome the psychological hurdles of their environment to meet operational targets.

This study seeks to address the performance deficit at SKOM Sdn. Bhd. by examining the synergistic relationship between training, the ISM Code, and job stress management, with a specific focus on the mediating role of commitment. By integrating these developmental, regulatory, and psychological dimensions into a single analytical framework, this research aims to move beyond a fragmented understanding of maritime human resources. It proposes a holistic model that emphasizes that operational excellence is not just a product of technical skill or strict compliance, but the result of a motivated and psychologically resilient workforce. Through this approach, the study provides a roadmap for maritime organizations to achieve their operational targets by harmonizing the technical demands of the sea with the human needs of the crew.

2. Methods

This study employs a robust quantitative research design with a dual approach: descriptive and confirmatory (Fu et al., 2021; Re & Magnani, 2023; Weber & Leuridan, 2008). The descriptive aspect is utilized to map the demographic characteristics and the distribution of variables among the respondents, while the confirmatory design is applied to test the hypothesized structural relationships between the exogenous, mediating, and endogenous variables within the proposed theoretical model.

Research Site and Subject Profile

The investigation was conducted within the operational environment of SKOM Sdn. Bhd. (SK Offshore & Marine), an offshore service provider based in Malaysia. The focus of the study was specifically directed toward the crew members stationed across 10 offshore vessels, including SK. Marco Polo, SK. Flenty, SK. Prodigy, SK. Perfect, SK. Paragon, SK. Line 605, SK. Dynamic, SK. Prime, SK. Prudence, and SK. Marathon. These vessels represent a high-pressure work environment where technical precision and safety compliance are paramount. The data collection phase spanned a four-month period from April to July 2024, capturing a snapshot of operational dynamics during peak offshore activities.

Population and Sampling

The study involved a total of 213 ship crew members as respondents. A purposive or census-based sampling approach was utilized to ensure that the participants had direct experience with the implementation of the International Safety Management (ISM) Code and the organizational training programs. This sample size is statistically sufficient to meet the requirements for complex structural modeling, providing a representative cross-section of various ranks and roles within the offshore fleet.

Measurement Scales

Data were gathered using a structured questionnaire designed to measure five key constructs: 1) Exogenous Variables: Training (technical and non-technical), Job Stress (psychological and physical strain), and ISM Code Implementation (safety compliance and procedural clarity); 2) Mediating Variable: Organizational Commitment (affective and professional attachment); 3) Endogenous Variable: Ship Crew Performance (task execution and operational reliability).

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Each construct was operationalized through multiple indicators derived from established maritime and human resource management literature. Responses were captured using a Likert scale, allowing for nuanced measurement of the crew's perceptions and experiences.

Data Analysis Technique

The primary analytical tool for this research was Structural Equation Modeling (SEM), executed through SmartPLS and supported by SPSS version 22. SEM was selected for its superior ability to handle latent variables and complex mediation paths simultaneously. The analysis proceeded in two distinct stages: 1) Outer Model Evaluation (Measurement Model): Assessing the validity (convergent and discriminant) and reliability (Cronbach's Alpha and Composite Reliability) of the research instruments; 2) Inner Model Evaluation (Structural Model): Testing the path coefficients, the R-square values, and the significance of the mediation effects.

This rigorous statistical framework ensures that the findings regarding the synergy between competence, mental health, and commitment are both scientifically valid and practically applicable to the maritime industry.

3. Results

The structural model analysis reveals a complex and differentiated pattern of relationships, demonstrating that ship crew performance in offshore maritime operations is not the result of a single isolated factor but rather a multifaceted interaction between technical, psychological, and safety-management variables. The initial stage of the analysis focused on the direct effects of the exogenous variables on organizational commitment, showing that different factors influence crew attachment in various ways. It was found that training exerts a positive but statistically non-significant direct effect on commitment. This suggests that while technical preparation improves the crew's readiness to perform their duties, it does not automatically translate into a deeper emotional or professional bond with the company unless it is accompanied by other supportive organizational elements.

In stark contrast, job stress emerged as one of the most powerful predictors in the model, exhibiting a strong negative and significant direct effect on commitment. This finding underscores the high sensitivity of crew attachment to the psychological and physical pressures inherent in offshore work; as stress levels rise due to fatigue, isolation, or heavy workloads, the willingness of crew members to remain dedicated to their organizational roles diminishes significantly. Meanwhile, the implementation of the International Safety Management (ISM) Code was found to have a positive and significant direct effect on commitment. Although the magnitude of this effect was relatively modest, it indicates that a structured safety environment provides a sense of professional order and accountability that fosters a more reliable and committed workforce.

When examining the direct drivers of ship crew performance, the results provide clear evidence of the importance of technical and regulatory factors. Training showed a positive and significant direct effect on performance, confirming that the acquisition of technical skills and operational knowledge directly enhances the quality of task execution on board. Similarly, the implementation of the ISM Code contributed positively and significantly to performance, suggesting that strict adherence to safety protocols and documented procedures creates a more disciplined and efficient working environment. However, job stress was again identified as a critical inhibitor, showing a negative and significant direct effect on performance. This result confirms that high levels of stress are not just a welfare issue but a direct operational risk that reduces concentration and task reliability among the crew.

The analysis of the mediating role of commitment provides the most significant insight into how these variables synergize. Interestingly, the direct effect of commitment on performance was positive but did not reach statistical significance when treated as a standalone predictor. This indicates that commitment does not function as an isolated driver of work output in the same way that training or safety procedures do. Instead, the indirect-effect analysis reveals that commitment serves as a crucial mediating mechanism. The study found that training, job stress, and the ISM Code all influenced performance through the indirect pathway of commitment. Specifically, training and the ISM Code became more effective in driving performance when they successfully fostered a sense of responsibility and attachment among the crew. Conversely, job stress exerted part of its damaging effect on performance by first eroding the crew's commitment.

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These findings collectively suggest that commitment acts as the psychological bridge or internal engine that translates organizational inputs—such as safety systems and training programs—into sustained operational outcomes. The significance of these indirect paths highlights that the synergy between technical competence and mental well-being is facilitated by how well the organization can maintain the crew's professional dedication. In the context of the performance decline observed at SKOM Sdn. Bhd., these results imply that the gap in hitting operational targets is likely linked to the combined impact of high stress and its subsequent erosion of crew commitment, which then neutralizes the potential benefits of technical training and safety compliance.

4. Discussion

The findings of this study provide a comprehensive understanding of how ship crew performance in offshore maritime operations is shaped by the complex interplay of technical development, psychological pressure, and safety governance. At the heart of this research is the realization that operational excellence is not merely a product of individual skill but is deeply rooted in how crews respond to their demanding work environment (Jiang et al., 2023; Nogueira et al., 2025). The results clearly indicate that training and the implementation of the International Safety Management (ISM) Code are essential pillars of performance, yet their effectiveness is inextricably linked to the mental well-being of the crew. This suggests that the maritime sector's traditional reliance on technical compliance must be balanced with a more nuanced approach to human resource management that prioritizes psychological resilience alongside operational readiness.

One of the most compelling insights from the analysis is the dual nature of training. While training was shown to directly improve performance by enhancing technical competence and emergency preparedness, its direct impact on organizational commitment was positive but not statistically significant. This nuance is critical for maritime managers to understand; it implies that while a well-trained crew member is more capable of executing tasks, specialized training does not automatically foster loyalty or emotional attachment to the firm. In the high-pressure context of offshore vessels, training functions primarily as a tool for operational discipline. To transform this technical capability into long-term commitment, organizations must ensure that training is perceived not just as a mandatory safety requirement, but as part of a broader supportive culture that recognizes and values professional growth.

The role of job stress as a dominant inhibitor of both commitment and performance highlights a significant vulnerability in offshore operations. The maritime environment is characterized by isolation, fatigue, and relentless responsibility, all of which act as chronic stressors. The strong negative correlation between stress and commitment found in this study confirms that psychological strain does more than just tire the individual; it erodes the very foundation of their professional dedication. When stress levels become overwhelming, the "synergy" between a crew member's skills and the organization's goals begins to break down. This finding positions mental well-being not as a secondary welfare concern, but as a primary operational risk (Ikbal et al., 2021; Kemitare et al., 2020; Suttapong et al., 2014). A crew that is technically proficient but psychologically exhausted is significantly more likely to underperform, regardless of how many training sessions they have attended or how strictly the ISM Code is enforced.

Furthermore, the positive influence of the ISM Code on both commitment and performance suggests that safety management systems serve a purpose beyond mere regulatory compliance. Effective implementation of the ISM Code provides a structured and predictable environment, which is vital in the volatile offshore sector. By establishing clear procedural boundaries and accountability, the code offers a sense of professional security that can actually bolster a crew member's sense of responsibility. This indicates that when safety protocols are genuinely integrated into the daily shipboard routine—rather than being treated as burdensome paperwork—they create a disciplined atmosphere where competence and mental clarity can flourish together.

The most transformative discovery in this research is the mediating role of organizational commitment. Although commitment did not act as a powerful independent predictor of performance, it functioned as the essential pathway through which all other variables exerted their influence. This suggests that commitment is the "internal engine" of the offshore fleet. Training, stress management, and safety

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systems only reach their full potential when they are filtered through a committed workforce. In the specific case of SKOM Sdn. Bhd., where performance targets have consistently been missed, the data suggests that the decline is a symptom of a breakdown in this mediating bridge. The synergy required to meet offshore operational targets is lost when the psychological connection between the crew and their mission is weakened by excessive stress or perceived lack of support (Bedarkar & Pandita, 2014; Klassen & Vereecke, 2012; Tamsah, Purnomo, et al., 2021).

Ultimately, the discussion points toward a holistic management paradigm for the maritime industry. Achieving operational targets requires a strategy that harmonizes the technical demands of the sea with the psychological needs of the people who navigate them. Maritime companies must treat competence and mental well-being as two sides of the same coin. By investing in relevant technical training while simultaneously mitigating job stress through better workload distribution and emotional support, organizations can strengthen crew commitment. This strengthened commitment then becomes the catalyst that turns procedural knowledge and safety compliance into the high-level performance necessary to survive and thrive in the challenging offshore environment.

5. Conclusion

This study concludes that achieving operational targets within the offshore maritime sector is fundamentally dependent on the synergy between technical competence and the mental well-being of the ship crew. The empirical evidence gathered from SKOM Sdn. Bhd. demonstrates that while training and the rigorous implementation of the International Safety Management (ISM) Code are indispensable pillars for enhancing performance, their effectiveness is significantly compromised when job stress is not adequately managed (Maletič et al., 2018; Mathibe et al., 2022; Tenrisanna et al., 2021). Training and safety protocols provide the necessary framework for operational discipline and skill execution; however, they do not operate in a vacuum. The negative impact of occupational stress emerged as a critical inhibitor, not only directly reducing task reliability but also eroding the psychological foundation required for sustained high performance in high-risk offshore environments.

A central finding of this research is the pivotal, albeit nuanced, role of organizational commitment as a mediating mechanism. The study reveals that commitment serves as the vital bridge that translates organizational inputs—such as specialized training and safety management systems—into tangible performance outcomes. Although commitment may not always act as a powerful standalone driver of performance, it functions as the internal engine that determines how effectively a crew member utilizes their technical skills and adheres to safety mandates under pressure. Conversely, the damaging effects of job stress are magnified when they successfully weaken this commitment, leading to the performance gaps observed in recent years (Ng et al., 2020; Tamsah, Farida, et al., 2021). This highlights that the "human element" in maritime operations is not just about physical presence or technical certification, but about the psychological attachment and resilience of the workforce.

In light of these findings, it is evident that a purely technical or regulatory approach to maritime management is insufficient for meeting modern operational challenges. To reverse declining performance trends and hit ambitious fleet targets, maritime organizations must adopt a more holistic strategy that harmonizes human resource development with psychological support. Improving crew performance requires an integrated management paradigm that balances workload distribution and mental health advocacy with continuous technical upskilling. By fostering a work environment where safety systems are perceived as supportive rather than burdensome, and where technical training is matched by emotional and professional recognition, companies can strengthen the commitment of their crews. Ultimately, this synergy between a competent, mentally resilient workforce and a robust safety culture provides the most reliable pathway to achieving excellence in the demanding offshore maritime industry.

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