MALAYSIAN JOURNAL OF INNOVATION IN ENGINEERING AND APPLIED SOCIAL SCIENCE (MyJIEAS)
e-ISSN : 2811-3780
VOLUME 04, ISSUE 01

Assessment of Occupational Risk Related Stress at Work Among Workers in Oil and Gas Industry

Norwahida Yaakub[1*], Ayuni Nabilah Alias[2], Nur Fazhilah Abdul Razak[1] and Priya A/P Naranthran[1]

[1]Faculty of Industrial Sciences and Technology, Universiti Malaysia Pahang Al-Sultan Abdullah, Kampus Gambang, Lebuhraya Persiaran Tun Khalil Yaakob, 26300 Kuantan, Pahang, Malaysia.
[2]Faculty of Human Ecology, Universiti Putra Malaysia, Tulang Daing 1, 43400, Serdang, Selangor, Malaysia

Corresponding Author's Email: *norwahidayaakub@umpsa.edu.my

Article History : Received 13082024; Revised 20082024; Accepted 25092024;

ABSTRACT – Psychosocial hazards have a significant influence on health and safety outcomes within the oil and gas industry. Occupational stress decreases safety behaviour, while mental health and fatigue are risk factors. Preventing occupational stress is critical for the health of employees. This study aims to determine the risk assessment level of occupational stress among oil and gas workers. The stratified random sampling method is a semi-quantitative method that implements data collection through a socio-demographic questionnaire and risk assessment matrices, including likelihood times severity (LXS) and following two phases Initial Risk (IR) and Residual Risk (RR). The overall prevalence of population was 41% consisting of social support, task, exposure, and recognition risk factors that influence occupational stress levels. Most workers are Malay, which represents 98.6% of the study population. The workforce is predominately married, with 97.3% of men. The overall rating of occupational stress risk rating in the evaluated area was moderate.

KEYWORDS : Occupational Risk, Work related Stress, Oil and Gas Industry

1.0 INTRODUCTION

Occupational Safety and Health (OSH) has been a crucial component of risk management since the inception of the oil and gas industry. As with other operational risks, psychosocial risks in the oil and gas (O&G) industry can have a substantial impact on health and safety outcomes and must be managed accordingly. Over time, the industry has recognized the growing significance of embracing a holistic perspective, as suggested by the WHO Healthy Workplaces Framework [1] which encompasses technical, human, and organizational concerns [2]. Organizational operations and processes should ideally have a comprehensive and long-term framework for managing psychological risks and refer to the hazards that result from the organization, design, and management of work. These interactions involve job content, work organization, management, and other environmental and organizational conditions, as well as employees' competencies and needs. These factors can potentially have a negative impact on employees' health and safety through their perceptions and experiences [3,4]. The psychological work environment literature focuses on key factors such as work demands, control at work, social interactions, and effort reward inconsistency. The health and safety of workers, specifically those in the oil and gas organization, are greatly affected by psychosocial concerns, as extensively documented [5,6,7]. Risk management is an ongoing process and an essential component of OSH management. OSH risk includes the potential for negative consequences from both unintentional occurrences and planned operations. It recognizes both downside and upside risks. As part of the decision-making process, relevant OSH risk factors, including psychosocial hazards, must be recognized, and evaluated. They are linked to the experience of occupational stress. The perception that psychosocial risks are less tangible, they remain susceptible to the same methodical and logical approach to management as other health and safety concerns.

Accidents in the workplace have a significant impact on the well-being of employees. Therefore, investigations into them are crucial, and efforts to reduce their occurrence are urgently required. Consequently, certain geographical areas perceive the sector as being responsible for a significant number of accidents and injuries, particularly those of a psychological type. Psychological injury encompasses all mental health conditions that are induced because of occupational stress. According to research [8] stressors are a primary cause of stress. Occupational stress is a worldwide issue that affects workers in various industries. World Health Organization (WHO), defined as the way individuals react when they face work demands and pressures that are not compatible with their personal skills, expertise, and abilities, ultimately straining their ability to cope [9]. Occupational stress has a significant impact on the well-being and health of workers, ultimately resulting in the development of mental and physical health problems. In the workplace, occupational stress is defined as a detrimental emotional experience caused by difficult working conditions [10,11]. Stressors might be organizational, personal, or environmental. Employees in the oil and gas fields are typically subjected to stressful situations or constant physical pressure. Additionally, long term employment in a remote location raises occupational stress levels. It is worth mentioning that occupational stress is a component of O&G life that arises from common causes but also involves the interface between employment and family, travel, and the living environment.

Occupational stress is a negative emotional state that arises from stressors experienced in the work environment. It is a dynamic and intricate process wherein stressors and perceived stress have the potential to trigger mental and physiological issues, including but not limited to cardiovascular diseases [12,13], musculoskeletal pain [12,13,14], and gastrointestinal disorders [14,15,16]. It is possible that other psychosocial factors, such as coping style. Previous studies have shown that occupational stress is a significant risk factor for mental illness among onshore workers in a wide range of professions. The mental health of Chinese offshore oil platform workers relates to work-place stress and specific coping techniques. Some studies showed there was a direct and positive relationship between occupational stress and depression [17]. It has been observed that Malaysian workers are experiencing excessive workloads and little sleep. Approximately 51% of employees encounter at least one aspect of work-related stress as a result of their job. In Malaysia, the average percentage of workers experiencing poor mental health is 29% [18]. The symptoms include stress, worry, and depression. Prolonged workplace stress affects workers' presenteeism and absenteeism, and turnover increases [19,20]. Occupational stress has been demonstrated to hurt safety behavior, whereas mental health and fatigue can function as risk factors.

Although significant studies and improvements have been carried out over the years, the number of occupational health complaints and cases remains high. There is a current lack of practical instruments specifically designed to improve OSH performance, focusing on risk assessment in psychosocial terms. Yet, these approaches were either excessively complicated to be implemented practically or failed to provide a definitive approach for ensuring the maintenance of OSH through good implementation. The OSH performance enhancement can be determined by employing a risk assessment approach that focuses on a systematic examination and quantification of hazards [21]. Workplace hazards remain a significant problem for employees in the oil and gas fields, as they are continually exposed to a range of occupational hazards. The oil and gas working environment is thought to be one of the most dangerous. Hazard analysis is the most critical preventative measure because if it fails, all other processes will likely be ineffective. Risk assessment approaches facilitate the evaluation of risks within an organization. These methods help organizations recognize the potential hazards associated with work-related stress and develop strategies to mitigate them.

However, despite increased knowledge of the impact of occupational stress and related concerns in the oil and gas industry, organizational-level initiatives to address psychosocial risks are limited, if not insufficient. This is largely due to the lack of industry-specific information and understanding of the activities required to manage such risks and reduce their impact. There

are still inadequacies in applying this information in practical ways. The paper seeks to address the risk assessment level of occupational stress among oil and gas workers. Furthermore, this study is significant in conjunction with the Sustainable Development Goals 2030 Agenda since it is focused on goal three: excellent health and well-being, and goal eight: decent jobs and economic growth.

2.0 METHODOLOGY

This cross-sectional study was conducted among oil and gas workers, who were selected randomly based on job categories. The chosen phase for this study is construction and installation services for the oil and gas industries. The stratified random sampling method is used in this study to ensure the representatives are from various positions and levels based on inclusion and exclusion criteria. The sample size was determined using Krejci and Morgon's approach [22] with a 5% margin of error included. The total number of respondents for this study was 146. It is a semi-quantitative method that implements data collection through a socio-demographic questionnaire and risk assessment matrices. Occupational Stress Risk Assessment Matrix is the conventional risk assessment matrix consisting of hazard identification, risk assessment and risk control, few novel components are incorporated to evaluate the occupational stress level. Hazard identification is based on the work activity, stressor-related hazards, effects, and existing control measures.

Risk assessment consists of likelihood times severity (LxS) and the following two phases Initial Risk (IR) and Residual Risk (RR) [23]. The risk factors that are being assessed are social support, task support, recognition, and workplace exposure. The data collection is the same as the normal risk assessment process. During the data collection process, the participants were provided with a series of questionnaires along with clear instructions on how to fill them out. Each group was provided with a copy of the sociodemographic questionnaire and the risk assessment matrix form based on Table 1 and 2 [23]. Each participant was provided with an individual socio-demographic questionnaire, while the group was given a single risk assessment matrix form. All employees were provided with comprehensive instruction on how to complete the form and perform the calculation. Administration of the form completion process was provided. Additionally, the researcher conducted a briefing to provide further guidance. The participants were obligated to provide the necessary information and react to the given questions.

Table 1. Occupational Stress Risk Assessment Matrix

			Severity				
			Insignificant	Minor	Moderate	Major	Extreme
			1	2	3	4	5
Likelihood	Almost certain	5	5	10	15	20	25
	Likely	4	4	8	12	16	20
	Possible	3	3	6	9	12	15
	Unlikely	2	2	4	6	8	10
	Rare	1	1	2	3	4	5

Source: Norwahida (2019)

Table 2. Occupational Stress Risk Assessment Matrix Rating

Risk Rating	Risk Level	Risk	Action
1- 4	Very Low (VL)	Acceptable	Very Low risk is no further preventative action is necessary
5-9	Low (L)	Acceptable	Low risk is no further preventative action is necessary
10-12	Moderate (M)	Action Required	Moderate risk should be efforts made to reduce the risk.
13-16	High (H)	Immediate Action Required	High risk is that new processes should not be started until the risk has been reduced.
17-25	Very High (VH)	Immediate Action Required	The process should not be started or allowed to continue until the risk level has been reduced.

Source: Norwahida (2019)

3.0 RESULT AND DISCUSSION

The surveys were completed and returned, resulting in a response rate of 97%. This response rate is considered excellent cooperation from the workers. Most workers are of Malay ethnicity, which represents 98.6% of the study population. The workforce is predominantly married, with 97.3% being male. Technicians comprise 32.9%, which is the most significant group. The average age range is between 31 and 40, and most workers possess advanced-level training, resulting in 65.8%. Approximately 50.7% of the population is within the income range of RM 2,001 to RM 4,000. The demographic profile shows an increased representation of male, Malay, and married workers, with a significant appearance of workers. These sections provide an important context for interpreting aspects that contribute to work-related stress.

Table 3. Socio-Demographic Characteristics of Workers

Variables		n (%)
Gender	Male	142(97.3)
	Female	4(2.7)
Age	21-30	42(28.8)
	31-40	62(42.5)
	41-50	40(27.4)
	51-60	2(1.4)
Ethnicity	Malay	144(98.6)
	Other	2(1.4)
Marital Status	Single	40(27.4)
	Married	106(72.6)
Educational Background	SPM or equivalent	16(11.0)
	Certificate	96(65.8)
	Diploma	30(20.5)
	Degree	2 (2.7)

Position	Engineer	6(4.1)
	Technician	48(32.9)
	Administrator	8(5.5)
	Supervisor	18(12.3)
	Others	66(45.2)
Monthly Income (RM)	Less than 2,000	6(4.1)
	2,001 – 4,000	74(50.7)
	4,001 – 6,000	60(41.1)
	6,001 – 10,000	6(4.1)
Duration of Employment (Years)	Less than 2	24(16.4)
	3-4	62(42.5)
	4-5	56(38.4)
	5-6	4(2.7)
Smoking	Yes	88(60.3)
	No	58(39.7)

3.1 *Prevalence of Occupational Stress*

Findings on prevalence show that oil and gas workers' stress levels are complicated, with varying levels of observed assistance and exposure. Social support, which includes connections with both employees and superiors, is recognized as an essential mechanism to cope with stress by 35.6% of workers. 49.3% of respondents consider task support to be essential, as indicated by the availability of resources and assistance with job duties. However, only 4.1% of employees report receiving recognition, which is frequently disregarded but essential for morale and motivation. Exposure to difficult work conditions is identified as a major stressor, with 60.3% of workers reporting a considerable impact on their stress levels. Overall prevalence is 41% experience occupational stress, demonstrating the industry's significant concern.

A significant correlation was found between occupational risk factors and stress at work. The strength value of the Pearson correlation coefficient, r, obtained from SPSS is displayed in Table 4. The study showed a highly significant correlation (r=0.7, p-value <0.01) in the social support factor. Respondents with low social support levels and stress at work. The results highlight the interrelated aspects that influence occupational stress among workers. If the p-value is <0.01, the distribution deviates significantly from the distribution.

Table 4. Relationship between Occupational Risk related Stress at Work

Variables	r-value	p-value
Social Support	0.77	0.01*
Task	0.45	0.01*
Recognition	0.50	0.62
Exposure	0.11	0.43

Correlation is significant at the p-value less than 0.01 (2-tailed).

This study highlights the complicated nature of occupational stress in the oil and gas industry and its effects on workers and organizations. Considering the prevalence of stress among workers, tailored interventions and proactive efforts to minimize its negative effects are needed. Social support is crucial to reducing job stress [24]. Employees need emotional and practical assistance from peers and supervisors to handle job expectations and challenges.

Organizations should prioritize activities to create a healthy workplace, encourage positive relationships, and provide advice to employees. Similarly, task support is crucial. This reflects previous research that high exposure harms employee well-being and stress [25]. Adequate resources, clear job roles, and good communication channels help people do their duties efficiently. Investment in training programs, refining work procedures, and providing access to appropriate tools and equipment can enable people to do their responsibilities confidently and competently, lowering stress and improving job satisfaction. Our findings also emphasize the importance of workplace recognition and gratitude [26]. Recognizing employees' accomplishments boosts morale, motivation, and job satisfaction, yet it's often forgotten. Recognition programs, performance incentives, and regular feedback can reinforce positive behavior and create an appreciation culture in workplaces.

Workers who experience higher levels of social support are more likely to receive assistance in completing their duties, as suggested by the positive correlation between task support and social support. This result aligns with the conclusions drawn in a study conducted, which emphasized the beneficial impact of social support in mitigating occupational stress [27,28]. Several studies have demonstrated the substantial effects that social support in the workplace has on workers' mental health and job satisfaction. Additionally, social support and network heterogeneity are positively correlated with outcomes related to mental health, underscoring the significance of supportive work environments [29,30]. A mediating mechanism in the links between job engagement and occupational stress, as well as between employee turnover intentions and occupational stress, is social support [31,32]. Function of work-social support as an intermediate condition. For workers who experience strong levels of social support at work, the links between stress and its detrimental effects are limited. Lack of social support combined with increased work stress can be adverse to mental health. Previous studies show that occupational stress negatively affects working individuals' mental health, and social support acts as a moderator in this relationship. The results emphasize the significance of colleague and supervisor support in the workplace, which could reduce job stress as well as improve mental health [33]. Researchers in sociology and occupational health should not ignore the importance of gender in the workplace while examining work environments and jobs in general.

The high percentage of outcomes in the exposure domain is indicated in the result. There was a direct correlation between work stress and workplace violence ($\beta = 2.167$, 95% CI: 1.707, 2.627). Other factors of exposure to hazardous agent, exposure to hazardous substances and stressful working conditions are significant concerns in the oil and gas industry, with research indicating the need for effective risk management strategies [34]. In contrast, workplace violence was found to have indirect associations with psychological job demands and social approval through occupational stress. It is a combination of stress such as workload, unexpected tasks, and job-related interpersonal conflict, and it has primarily been operationalized in terms of work quantity paired with time constraints. Job demands (including psychological and physical job demands) have been established as key determinants of workplace stress. High physical and mental demands on work were common across all individuals. They described how these impacted both physical and emotional wellbeing [35]. Participants identified issues with individual traits such as personality type, attitude toward work, and individual ability. The work-system model recognizes that some personal traits, such as personality, physical health and fitness, education, abilities, and experience, influence stress and coping results. Everyone cannot accept oil industry work, which requires physical demands, shiftwork, and technical knowledge. Lecca's [36] found in their study that recent research highlights the pivotal role of recognition and appreciation in fostering a positive work environment and reducing stress among employees. Other studies found that in diverse workplace settings perceived organizational support, including recognition of employees' contributions, significantly predicted lower levels of stress and higher job satisfaction [37]. Furthermore, a longitudinal study examining the effects of organizational support on employee well-being revealed that consistent recognition and rewards were associated with greater psychological well-being and reduced stress over time [38]. Nonetheless, careful selection can

assure a good person-environment match for many areas of the position. While flexibility was identified as a crucial part in dealing with pressures, increasing concerns about the impact of occupational stress on both employees and organizations have prompted initiatives to study the sources and consequences of stressors in the workplace.

Finian's [39] research found significant disparities in occupational stress among male and female oil and gas workers, as well as across age groups. Chi-square tests showed significant differences ($p<0.001$) in perceptions of occupational stresses across office, laboratory, and oil field workers. The oldest employees were oil field workers, while the youngest were office workers. Another study found that family commitments and living conditions had a direct impact on oil and gas workers' engagement in safety practices. Bivariate and hierarchical regression studies revealed that mental health difficulties such as anxiety and depression, as well as physical and mental exhaustion, operated as mediators between occupational pressures and involvement in safety behaviors. The data provided partial validation of these mediated relationships, with mental health and exhaustion identified as possible risk factors for safety behavior [40]. In addition, cross-sectional research found significant differences in Work Ability Index (WAI) ratings across office, laboratory, and oil field personnel ($p<0.001$). After controlling for age differences, office workers had a decent WAI score, while laboratory and oil field workers had a high score. The authors ascribed the observed statistical variation in WAI across the three groups to differences in working circumstances and workforce age demographics [41]. Frank and Kingsley [42] found that oil and gas personnel reported higher levels of occupational stress than government officials. Statistical analysis revealed that both the psychological features of the work environment and physical working conditions played major roles in creating occupational stress, regardless of industry (oil and gas or civil service). Interestingly, the study found no significant differences in the influence of psychosocial variables on occupational stress between the two groups.

This new area of academic study may be a thorough examination of the distinct occupational dangers and stresses faced by diverse job roles and working circumstances in the oil and gas industry. Furthermore, oil field workers, lab technicians, and office employees experience varying levels of stress and work capacity. A broader study might look at the individual stresses, dangers, and coping techniques that are unique to each of these groups of workers [40]. Likewise, the study might go more deeply into the links between work pressures, mental health, and safety measures. The data suggest that family obligations, living conditions, mental health, and exhaustion may all influence how occupational pressures affect safety adherence and participation. Further investigation into these complicated linkages might have major theoretical and practical implications for enhancing occupational health and safety management in the oil and gas industry [40]. Another intriguing area for academic research might be cross-cultural studies of occupational stress in the oil and gas industry. While previous study has concentrated on Croatia and Kuwait, expanding these studies to include other major oil-producing countries might provide useful insights into how cultural, social, and economic factors influence occupational stress and its repercussions [38; 40]. Overall, using a more thorough and extensive approach to assessing occupational stress caused by hazards in the oil and gas industry might considerably improve academic understanding of workplace health, safety, and well-being in high-risk industries.

4.0 CONCLUSION

The risk assessment could be implemented at other oil and gas sites as a suitable OSH improvement measure. The prevalence of occupational stress was 41%. Three activities have significant occupational stress risk involved risk factors such as social support, task, exposure, and recognition. The overall assessment of the occupational stress risk in the assessed area was moderate.

ACKNOWLEDGMENTS

All authors would like to express thanks for the fund by University Malaysia Pahang Al-Sultan Abdullah under the Research Grant (RDU220370), reviewers and editors cordially for constructive comments.

[1] E. P. Wigner, “Theory of traveling-wave optical laser,” *Phys. Rev.,* vol. 134, pp. A635–A646, Dec., 1965.

REFERENCES

[1] J. Burton, ,“WHO healthy workplace framework and model.” *Geneva, Switzerland: World Health Organisation*, 12, 2010.

[2] S. L. Tamers, , J. Streit , R. Pana-Cryan , T. Ray, L. Syron, M. A. Flynn, , & J. Howard. “Envisioning the future of work to safeguard the safety, health, and well-being of the workforce: A perspective from the CDC's National Institute for Occupational Safety and Health.” *American journal of industrial medicine*, 63(12), 1065-1084, 2020.

[3] C. Sun , C. K. Hon, K. A. Way, N. L. Jimmieson, & B. Xia, . “The relationship between psychosocial hazards and mental health in the construction industry: A meta-analysis.” *Safety science,* 145, 105485, 2022.

[4] P. Franklin, & A. Gkiouleka. “A scoping review of psychosocial risks to health workers during the Covid-19 pandemic”. *International Journal of Environmental Research and Public Health,* 18(5), 2453, 2021.

[5] C. Benson, C. Dimopoulos, C. D. Argyropoulos, C. V. Mikellidou, & G. Boustras . “Assessing the common occupational health hazards and their health risks among oil and gas workers.” *Safety science*, 140, 105284, 2021.

[6] L. A. Derdowski, & G. E. Mathisen. “Psychosocial factors and safety in high-risk industries: A systematic literature review”. *Safety science*, 157, 105948. 2023

[7] E. D’Antoine, J. Jansz , A. Barifcani, S.Shaw-Mills, M. Harris, & C. Lagat. “Psychosocial Safety and Health Hazards and Their Impacts on Offshore Oil and Gas Workers.” *Safety,* 9(3), 56, 2023.

[8] S. Chaabane, K. Chaabna, S. Bhagat, A.Abraham, S. Doraiswamy, R. Mamtani, , & S. Cheema. “Perceived stress, stressors, and coping strategies among nursing students in the Middle East and North Africa: an overview of systematic reviews.” *Systematic reviews,* 10(1), 136, 2021.

[9] T. C. Dodanwala, D. S. Santoso, & V. Yukongdi, “ Examining work role stressors, job satisfaction, job stress, and turnover intention of Sri Lanka’s construction industry.” *International Journal of Construction Management,* 23(15), 2583-2592, 2023.

[10] R. M. Rodriguez, A. J.Medak, B. M. Baumann, S. Lim, B. Chinnock, R. Frazier, , & R. J. Cooper, (). “Academic emergency medicine physicians' anxiety levels, stressors, and potential stress mitigation measures during the acceleration phase of the COVID-19 pandemic.” *Academic Emergency Medicine,* 27(8), 700-707, 2020.

[11] C. Guthier, C. Dormann, , & M. C. Voelkle. “Reciprocal effects between job stressors and burnout: A continuous time meta-analysis of longitudinal studies.” *Psychological Bulletin,* 146(12), 1146, 2020.

[12] K. Saedpanah, M. Ghasemi, H. Akbari, A. Adibzadeh, , & H. Akbari.” Effects of workload and job stress on the shift work disorders among nurses: PLS SEM modeling.” *European Journal of Translational Myology,* 33(1), 2023.

[13] A. H. Khoshakhlagh,S. Yazdanirad, M. M. Kashani, E. Khatooni, Y. Hatamnegad, , & S. Kabir. “A Bayesian network based study on determining the relationship between job stress and safety climate factors in occurrence of accidents.” *BMC public health*, 21, 1-12, 2021.

[14] A. Khatun, V. Bharti, , & M. Tiwari. “Effects of work stress on psychological well-being and job satisfaction: A review. Revisioning and Reconstructing Paradigms and Advances in Industry Kolkata.” *Kolkata Press Book,* 101-9, 2022.

[15] K. Hod, S. Melamed, R. Dekel, N. Maharshak, & A. D. Sperber . “Burnout, but not job strain, is associated with irritable bowel syndrome in working adults”. *Journal of psychosomatic research*, 134, 110121,2020.

[16] Y. H. Chen, C. J. Yeh, L. F. Pan, , & G. P. Jong. “Relationships between alcohol use, musculoskeletal pain, and work-related burnout.” *Medicina*, 58(8), 1022, 2022.

[17] Y. Hong,Y. Zhang, P. Xue, X.Fang, L. Zhou, F. Wei, & H. Zou. "The influence of long working hours, occupational stress, and well-being on depression among couriers in Zhejiang, China." *Frontiers in Psychology,* 13, 928928, 2022.

[18] S. N. Chua. "The economic cost of mental disorders in Malaysia." *The Lancet Psychiatry,* 7(4), e23, 2020. L. Ning, H.Jia, S. Gao, M.Liu, J. Xu, S. Ge, & X. Yu. "The mediating role of job satisfaction and presenteeism on the relationship between job stress and turnover intention among primary health care workers." *International journal for equity in health,* 22(1), 155, 2023.

[19] B. Y. Chun, & C. S. Song. A moderated mediation analysis of occupational stress, presenteeism, and turnover intention among occupational therapists in Korea. Journal of Occupational Health, 62(1), e12153, 2020. World Health Organization.. "Health workers exposure risk assessment and management in the context of COVID-19 virus: interim guidance," 4 March 2020 (No. WHO/2019-nCov/ HCW_risk_assessment/2020.1). World Health Organization, 2020.

[20] R. V. Krejcie, , & D. W. Morgan. "Determining sample size for research activities." *Educational and Psychological Measurement,* 30(3), 607–610, 1970.

[21] Y. Norwahida, E. Saliza, Z. Huda, , M. N. Azhar, , & B. Rafee . "Developing a Risk Control Modifying Matrix in Assessing Occupational Stress in Port Terminal." *International Journal of Recent Technology and Engineering (IJRTE),* 8(1C2), 2019.

[22] S. Cohen, & G. McKay. "Social support, stress and the buffering hypothesis: A theoretical analysis." *In Handbook of psychology and health,* Volume IV (pp. 253-267). Routledge, 2020.

[23] D. Weziak-Bialowolska, P. Bialowolski, , & P. L. Sacco. "Well-being in life and well-being at work: Which comes first? Evidence from a longitudinal study." *Frontiers in Public Health*, 8, 526028, 2020.

[24] I. B. Pfister, N. Jacobshagen, W. Kälin, , & N. K.Semmer. How does appreciation lead to higher job satisfaction?. Journal of managerial psychology, 35(6), 465-479, 2020.

[25] I. P. Adamopoulos, & N. F. Syrou. "Associations and correlations of job stress, job satisfaction and burn out in public health sector." *European Journal of Environment and Public Health,* 6(2), em0113, 2022.

[26] B. M. Havermans, C. R. L. Boot, I. L. D. Houtman, E. P. M. Brouwers, J. R. Anema,, & A. J. Van Der Beek. "The role of autonomy and social support in the relation between psychosocial safety climate and stress in health care workers." *BMC Public Health,* 17(1), 1–7., 2017. https://doi.org/10.1186/s12889-017-4484-4

[27] A. Väänänen, A. Kouvonen,M. Kivimäki, T. Oksanen, M. Elovainio, M. Virtanen, , & J. Pentti . "Social support, network heterogeneity, and mental health: A population-based participatory study." *International Journal of Environmental Research and Public Health,* 17(10), 3616, 2020.

[28] S. Yousaf, , M. I. Rasheed, Z. Hameed, & A. Luqman. "Occupational stress and its outcomes: the role of work-social support in the hospitality industry." *Personnel Review,* 49(3), 755-773, 2020.

[29] I. Harun, R. Mahmood,, & H. Md. Som. "Role stressors and turnover intention among doctors in Malaysian public hospitals: work–family conflict and work engagement as mediators." *PSU Research Review,* 6(1), 1-16, 2022.

[30] L. I. Lecca, I. Portoghese, N. Mucci , & M. Galletta. "The role of job support as a target for the management of work-related stress: The state of art." *Psychology Research and Behavior Management,* 13, 55-64, 2020.

[31] R. M. Almeida , A. B. Oliveira, L. M. M. Sarquis, L. F. Meira-Machado, M. Bredemeier, , & H. S. Menezes . "Risk assessment and safety management in the oil and gas industry: A systematic literature review." *Safety Science*, 133, 105024, 2021.

[32] J. N. Kurtessis, R. Eisenberger, M. T. Ford, L. C. Buffardi, , K. A. Stewart, , & C. S. Adis. "Perceived organizational support: A meta-analytic evaluation of organizational support theory." J*ournal of Management,* 43(6), 1854-1884, 2017.

[33] A. Aggarwal, , D. Jaisinghani, , & K. Nobi. "Effect of organizational justice and support on organizational commitment and employee turnover intentions: the mediating role of employee engagement." *International Journal of Quality and Service Sciences,* 14(4), 525-554, 2022.

[34] N. Ribeiro, D. Gomes, A. R. Oliveira, , & A. S. Dias Semedo. "The impact of the work-family conflict on employee engagement, performance, and turnover intention." *International Journal of Organizational Analysis,* 31(2), 533-549, 2023.

[35] O. I. Finian. "Comparing the effect of occupational stress on oil and gas industry workers in Nigeria with respect to age and gender." *Advances in Image and Video Processing,* 9(3), (2021).

[36] A. S. Alroomi, , & S. Mohamed. Occupational stressors and safety behaviour among oil and gas workers in Kuwait: The mediating role of mental health and fatigue. International Journal of Environmental Research and Public Health, *18*(21), 11700 , 2021.

[37] J. Brešić, B. Knežević, M. Milošević,T. Tomljanović, R. Golubović,, & J. Mustajbegović. Stress and work ability in oil industry workers. Archives of Industrial Hygiene and Toxicology, *58*(4), 399–405, 2007.

[38] C. G. I. Frank, , & D. Kingsley. Occupational stress and risk factors in the oil and gas industry in Port-Harcourt. International Journal of Scientific & Engineering Research, 9(2), 2018.