Measuring Item Validity and Reliability Psychosocial Factor with Human-Computer Interaction

Muhammad Fajar Wahyudi Rahman[1], Sri Gunani Partiwi[2], Retno Widyaningrum[3]

[123]**Industrial and System Engineering Department, Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia**

Email: muhammadfajarwr@gmail.com

Abstract. This research is motivated by the increasing attention to psychosocial factors as a crucial aspect influencing worker safety in the construction industry. The objective of this study was to formulate valid and reliable measurement items for psychosocial factors and to examine the influence of psychosocial factors on the safety performance of construction workers. This study employed a quantitative approach, collecting data through questionnaires from 154 construction workers at a large contractor company in Indonesia. The sampling technique used complex probability sampling with area sampling, and data analysis was performed using PLS-SEM using SmartPLS 3. The results indicate that of the six dimensions of psychosocial factors, only role ambiguity and individual autonomy significantly influence occupational safety performance, while work stress, work-family conflict, social support, and interpersonal conflict do not show significant effects. This study provides originality by integrating SEM analysis and a comprehensive mapping of psychosocial factors in the context of a large contractor, as previously discussed. The findings offer guidance for safety managers and policymakers to optimize the management of role ambiguity and enhance individual autonomy, as well as to conduct an in-depth evaluation of other dimensions that impact construction worker safety performance.

Keywords: Psychosocial factors, Safety performance, Construction industry, PSIDAR

Introduction

The construction industry is known as one of the most high-risk industries worldwide, being complex and dynamic (Li et al., 2018). The characteristics of the construction industry, which involves a high-hazard work environment, irregular work schedules, and tight deadline pressures, create psychosocial conditions that impact worker safety performance (Raharjo et al., 2018). The construction industry in Indonesia contributes significantly to the growth rate of Gross Domestic Product (GDP), with construction services growing at approximately 13.7% per year (Raharjo et al., 2018). Data from the Indonesian Ministry of Manpower reported 114,000 workplace accidents in the construction sector in 2019, increasing to 177,000 in 2020 (ITN, 2021). A significant relationship between psychosocial factors and occupational safety performance has been proven in various studies, where psychosocial factors occur at two levels, namely the organizational level (interpersonal conflict and social support) and the individual level (work stress, role ambiguity, work-family conflict and autonomy) which affect the psychological condition of workers and impact occupational safety performance (Tong et al., 2021; Rodriguez et al., 2020).

This study draws on the Job Demands-Resources (JD-R) theory (Bakker & Demerouti, 2014, 2017), which explains that psychosocial factors are predictors involving two job characteristics: job demands and job resources. These two theoretical models provide a strong foundation for understanding how job demands and available resources can influence workers' psychological well-being and safety performance. Several studies have identified specific components of psychosocial factors that influence safety performance. In this extreme social context, considering the psychological risks of the construction industry, several scholars have studied the psychosocial factors (e.g., job stress, social support, and interpersonal conflict) faced by construction workers that may influence burnout, well-being, engagement, and suicide rates (Pirzadeh & Lingard, 2021; King & Lamontagne, 2021; Alsharef et al., 2021). and influence workers' psychological conditions and impact

occupational safety performance (Idrees et al., 2017; Yang et al., 2020a,b; Nwaogu et al., 2020; Rodriguez et al., 2020). This study will examine six indicators, including factors at the individual and organizational levels, that have been shown to have a significant influence on occupational safety performance.

At the individual level, a study by Riyadi (2018) revealed that job stress is a major predictor of reduced work performance. Job stress must be managed because it can lead to various counterproductive work behaviors and lower work contributions (Ghaffar, 2016). In addition to job stress, role ambiguity is defined as a lack of clear understanding of job expectations, scope, and responsibilities (Leung et al., 2005). Construction workers' understanding of their roles becomes blurred when they are confused due to internal or external reasons (Maslach & Leither, 2008). Previous research has shown a relationship between role ambiguity and safety performance (Zhou et al., 2020). A lack of understanding of the role of construction workers can lead to workers not understanding the safety procedures that must be followed, thus increasing the potential for workplace accidents. Another influential factor is worker-family conflict. Well-managed worker-family conflict can increase organizational process involvement in achieving quality management. Conversely, unresolved conflict can disrupt workers' focus on tasks and safety procedures (Grzywacz & Marks, 2000). In line with Jehn (1995), good conflict management can reduce interpersonal tension and contribute to improving work quality, including in terms of safety.

At the organizational level, autonomy and social support also play a significant role in the context of occupational safety. Employee autonomy can enhance their self-monitoring abilities in the workplace, which in turn makes employees more focused on their work and willing to face and resolve difficulties (Malinowska et al., 2018). Meanwhile, employees need social support to better implement safe behaviors and ensure company safety performance in the construction industry (Grill & Nielsen, 2019). Research by Kaynak (2003) and Psychogios & Priporas (2007) confirms that the success of a total quality management system is highly dependent on organizational support that encourages open communication, strengthens work teams, and recognizes the contributions of each individual. Although the importance of psychosocial factors has been recognized, there are still gaps in the measurement and validation of instruments to measure these factors specifically in the construction industry context (Sunindijo & Kamardeen, 2017). The hypotheses in this study are:

H1. Job stress negatively affects occupational safety performance.
H2. Role ambiguity negatively affects occupational safety performance.
H3. Work-family conflict negatively affects occupational safety performance.
H4. Individual autonomy positively affects occupational safety performance.
H5. Social support positively affects occupational safety performance.
H6. Interpersonal conflict negatively affects occupational safety performance.

The novelty of this research is that no previous studies have comprehensively discussed the testing of measurement items for psychosocial factors in the construction industry. This study aims to measure the extent to which psychosocial factors can influence workers in the construction industry by examining the influence of occupational safety performance on this relationship through the development of a valid and reliable measurement instrument. Therefore, this research is expected to provide theoretical and practical contributions to the development of more effective occupational safety management strategies in the Indonesian construction industry.

Methods

This research design employed a quantitative approach, with data collection distributed through offline and online questionnaires. The research location was in the Oil and Gas Civil Engineering Construction sector. It was conducted within the Tank Modification Project Area of PT. Pertamina Maintenance & Construction. The population in this study were construction sector workers, including those involved in medium- to large-scale construction project contractors in Indonesia. The sample in this study was 154 workers in the Tank Modification Project Area of PT. Pertamina Maintenance & Construction.

The measurement scale used in this study was a 6-point Likert scale. According to Sekaran & Bougie (2016: 215), a Likert scale is designed to assess the degree to which subjects agree or disagree. In this study, a total of 48 statement items were submitted. Measurement of psychosocial factors refers to six dimensions adapted from the research by Tong et al. (2021), which were created and developed by the researchers

themselves. Meanwhile, the occupational safety performance variable consists of 12 items, comprising three indicators according to Yi et al. (2021). Figure 1 shows the conceptual model in this study.

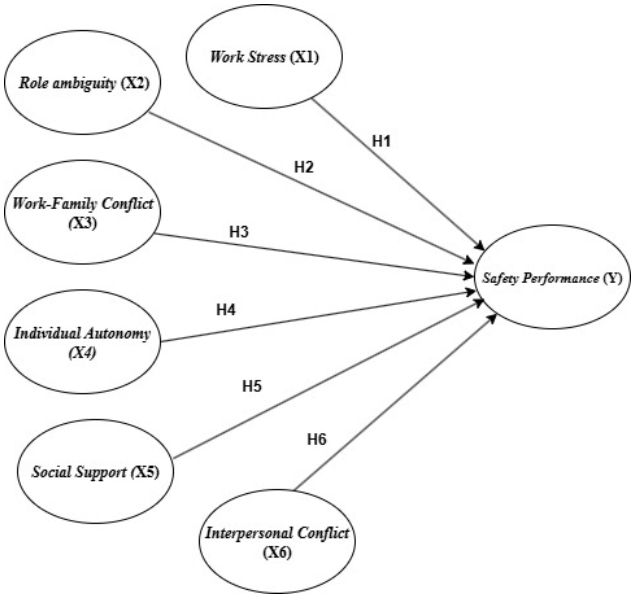

Figure 1. Conceptual Model

Data analysis in this study used Partial Least Squares - Structural Equation Modeling (PLS-SEM) using SmartPLS 3 software to estimate model parameters. PLS-SEM was chosen for this study because it is consistent with recent research in leading journals (Hair et al., 2019). The analysis procedure followed the PLS approach, which includes evaluation of the measurement model and structural model, as proposed by Rahman et al., 2022.

Furthermore, to confirm the results of the statistical analysis using the PLS-SEM approach, the PSIDAR method was applied in this study. The method called PSIDAR (video-och PSychosocIal Datorbaserad ARbetsanalys) was developed by Hanse & Forsman, (2001) as an extension of VIDAR (VIdeo-och physical Datorbaserad Arbetsanalys) (Kadefors & Forsman, 1997, 2000) to evaluate specific unsatisfactory psychosocial situations that an individual experiences during his or her daily work. PSIDAR is based on the individual's own perceptions and cognitions. It uses video-computer communication and facilitates the assessment of, for example, a typical workday in relation to low job control and high job demands.

Result

Measurement Model Assessment

According to Rahman et al. (2022), factor loadings must be equal to or greater than 0.50. The analysis results showed that all items had outer loadings above 0.50. Hair et al. (2020) recommend a cut-off value of 0.70 for Composite Reliability (CR). In this study, CR values for all items ranged from 0.924 to 0.952, exceeding the recommended value of 0.70. Furthermore, Cronbach's Alpha (CA) values in this study ranged from 0.900 to 0.963, exceeding the minimum standard of 0.70. Finally, an AVE value of 0.50 indicates that 50% of the items provide adequate explanation of the construct (Hair et al., 2020). In this study, AVE values for all constructs ranged from 0.531 to 0.778, exceeding the recommended value of 0.50. Table 1 shows that the convergent validity of all constructs has been confirmed in this study.

Table 1. Measurement Model Assessment

Variabel	Loadings	CR	CA	AVE
Psychosocial Factors				
Job Stress (X1)		0.924	0.900	0.712
I often feel tense or anxious at work	0.744			
My job often makes me very frustrated or angry	0.907			
I feel insecure at work	0.858			

I usually feel under a lot of pressure at work	0.747			
There are many aspects of my job that can make me very frustrated about many things	0.943			
Role Ambiguity (X2)		0.946	0.928	0.778
I have clear authority at work	0.897			
I have clear and planned goals and objectives for my work	0.947			
I have managed my time effectively	0.862			
I know my responsibilities at work	0.921			
I know exactly what the company expects	0.774			
Work-Family Conflict (X3)		0.942	0.923	0.764
I spend a lot of time on work responsibilities	0.899			
I am often so emotionally drained when I get home from work that it prevents me from spending time with my family	0.907			
No matter how good a job I do at work, it doesn't help me be a better parent or partner	0.883			
I have to sacrifice time with my family because of the amount of time I spend on work responsibilities	0.814			
Because I am often stressed by family responsibilities, I have difficulty concentrating on my work	0.864			
Individual Autonomy (X4)		0.939	0.924	0.688
I feel free to express my ideas and opinions in this job	0.879			
I feel like I can be myself	0.862			
I often feel like I don't have to follow other people's orders at work	0.797			
If I had a choice, I would work differently	0.884			
My work assignments align with what I want to do	0.700			
I feel free to do my work the way I do it best	0.822			
I feel forced to do things differently from the way I want to work	0.846			
Social Support (X5)		0.952	0.941	0.740
My supervisor supports me with the human resources needed for my assignments	0.890			
My supervisor supports me with the equipment needed during my assignments	0.935			
My supervisor motivates and encourages me to improve my performance	0.880			
My supervisor promotes me when I perform well	0.744			
The company values my contributions to well-being	0.842			
The company shows great concern	0.860			
The company values my character and behavior	0.860			
Interpersonal Conflict (X5)		0.924	0.903	0.635
There is a lot of friction among coworkers	0.749			
There are many personality conflicts among coworkers	0.818			
There is a lot of tension among coworkers	0.863			
There are many emotional conflicts among coworkers	0.840			
Workplace members often have differences of opinion regarding the work being done	0.822			
There are many conflicts about ideas among coworkers	0.645			
There are many conflicts about different methods in the field among coworkers	0.820			
Occupational Safety Performance (Y)		0.930	0.921	0.531
I use all necessary safety equipment to perform my job	0.625			
I use proper safety procedures to perform my job	0.644			
I ensure the highest level of safety when performing my job	0.674			
I communicate safety programs within the company	0.633			
I make extra efforts to improve workplace safety	0.620			
I volunteer for tasks/activities that help improve workplace safety	0.824			
I ensure a safe work environment	0.872			
I remind coworkers to focus on safety while working	0.862			
I take a break when experiencing an unfavorable work situation	0.838			

I stop work activities when I am not focused on my work	0.634			
My company provides first aid at work	0.782			
My company provides medical personnel at work	0.654			

After convergent validity was met, the discriminant validity of the measurement model was tested using the Fornell-Larcker criterion. The analysis results showed that the square root of the AVE for each construct was greater than the correlation between constructs, thus meeting the Fornell-Larcker criterion (Table 3). This finding indicates that each construct explains more of the variance of its own indicator than the variance of the indicators of other constructs, so the discriminant validity between constructs can be considered adequate.

Table 3. Discriminant Validity—Fornell Larcker Criteria

Variable	Mean	X1	X2	X3	X4	X5	X6	Y
Job Stress	4.42	0.844						
Role Ambiguity	4.71	0.726	0.882					
Worker-Family Conflict	4.34	0.890	0.645	0.874				
Individual Autonomy	4.44	0.671	0.649	0.712	0.829			
Social Support	4.58	0.710	0.798	0.695	0.817	0.860		
Interpersonal Conflict	4.40	0.817	0.774	0.793	0.747	0.838	0.797	
Safety Performance	5.04	0.422	0.571	0.386	0.580	0.591	0.515	0.729

Based on the results of respondents' answers using Likert scale measurements, the range of five must be divided by three to produce a range of 1.33 (1.00 - 2.33 = low; 2.34 - 3.67 = moderate; 3.68 - 5.00 = high) which is then used as the basis for interpreting the average value of the variable (Rahman et al., 2022). The average results of respondents' answers obtained the following values: stress = 4.43; role ambiguity = 4.71; work-family conflict = 4.34; individual autonomy = 4.75; social support = 4.58; interpersonal conflict = 4.44; and occupational safety performance = 5.01. Based on respondents' assessments of the research variables, it can be seen that all answers from respondents are classified as high.

Table 4. Analysis of the Coefficient of Determination

Variable	R Square	R Square Adjusted
Safety performance	0.425	0.411

The R-Square test results are used to measure interrelated variables but do not necessarily indicate definite causality. Based on the data in Table 4, it can be seen that the occupational safety performance construct has an R^2 value of 0.425 (adjusted R^2 = 0.411), which indicates that 42.5% of the variation in occupational safety performance can be explained by the predictor variables included in the model.

Table 5. Hypothesis Testing

Relationship	Coefficient	t-statistic	p-value	Information
Direct Effect				
Job stress → safety performance	-0.012	0.097	0.923	Rejected
Role ambiguity → safety performance	0.328	2.894	0.004	Accepted
Work-family conflict → safety performance	-0.216	1.833	0.067	Rejected
Individual autonomy → safety performance	0.386	3.840	0.001	Accepted
Social support → safety performance	0.146	1.073	0.284	Rejected
Interpersonal conflict → safety performance	0.032	0.234	0.815	Rejected
Level significant (5%): t-statistics ≥ 1.96; p-value ≤ 0.05				

Structural Model Assessment

The next stage is the structural model assessment (inner model), which aims to test the influence of relationships between variables or hypothesized values between variables. This structural model assessment

reports path coefficients, p-values, and t-statistics within the structural model to evaluate the significance of the hypotheses (Hair et al., 2019). Table 5 shows the results of the hypothesis test for direct relationships between variables.

In the previous discussion of hypotheses, H1 stated that job stress does not affect occupational safety performance. Path analysis results showed that this relationship was insignificant (β = -0.012, t-statistic = 0.097, p > 0.923), therefore, H1 was rejected. Furthermore, the results of testing hypothesis H2 showed that role ambiguity had a positive and significant effect on occupational safety performance (β = 0.328, t-statistic = 2.894, p < 0.05), therefore, H2 was accepted. Hypothesis H3 examined the effect of work-family conflict on occupational safety performance. The test results showed that this relationship was insignificant (β = -0.216, t-statistic = 1.833, p > 0.05), therefore, H3 was rejected.

Furthermore, hypothesis H4 found a significant effect between individual autonomy and occupational safety performance. With the results of the path analysis (β = 0.386, t-statistic = 3.840, p < 0.05), so H4 is accepted. Hypothesis H5 is a test of the social support variable on work safety performance which shows insignificant results. The results of the path analysis (β = 0.146, t-statistic = 1.073, p > 0.05), so H5 is rejected. Finally, hypothesis H6 tests the influence between interpersonal conflict and work safety performance which shows an insignificant effect. The results of the path analysis show (β = 0.032, t-statistic = 0.234, p > 0.05) so H6 is rejected.

Discussion

The results of the path analysis indicate that job stress does not significantly affect occupational safety performance, thus rejecting hypothesis H1. This finding aligns with similar findings by Mardikaningsih et al. (2022), which showed that the correlation between job stress and productivity does not always show statistical significance, depending on individual characteristics and the work environment context, particularly in the construction sector. Consistent with this finding, research by Sampson & DeArmond (2014) confirms that stressors should have a significant negative impact on safety performance, especially when employees have limited or no control over job stressors such as role ambiguity and role conflict. However, when employees possess the ability or skills to manage various forms of stressors, such as diversifying work methods, collaborating with multiple workgroups with different operational areas, and working under consistent and non-conflicting policies and guidelines, safety performance is expected to improve.

The findings of this study demonstrate a significant influence between role ambiguity and occupational safety performance. Research conducted by Zhu (2022) found a positive relationship between role ambiguity and occupational safety performance. The results of this study revealed that when employees perceive role ambiguity as a challenge (challenge stressor), they tend to allocate greater energy and effort to completing assigned tasks, even without fully considering the potential risks that may arise. It can be concluded that role ambiguity can have a positive impact on safety performance, particularly when perceived as a challenge that encourages workers to increase their efforts and performance. This positive impact can be optimally realized through the implementation of an effective mentoring system to reduce excessive levels of role ambiguity.

The results of this study indicate that there is no significant effect between work-family conflict and safety performance. This finding aligns with research conducted by Cullen (2007), which found consistent results with this study, namely that work-family conflict has no significant relationship with safety performance. These results indicate that work-family conflict has the potential to reduce workers' focus and attention, especially in sectors with high safety demands such as construction and transportation. The relationship between work-family conflict and safety performance may be moderated by other contextual factors, such as the type of job, the industry's risk level, or employees' coping mechanisms.

The results of this study indicate that individual autonomy has a positive and significant effect on occupational safety performance. Research conducted by Wang (2025) indicates that construction workers tend to perceive supervisor support as a form of increased autonomy, rather than external pressure or control. This finding indicates that personal attitudes toward safety play a significant role in ensuring compliance with occupational safety procedures. It can be concluded that individual autonomy has a positive effect on occupational safety performance through increased responsibility, intrinsic motivation, adaptability, and decision-making ability. Furthermore, a high perception of autonomy boosts workers' intrinsic motivation to comply with safety protocols and increases the effectiveness of safety program implementation. These findings confirm that an autonomy-oriented management approach is an effective strategy for improving occupational safety performance, particularly in the construction industry.

The findings of this study indicate an insignificant effect of social support on occupational safety performance. Interpretation of the results suggests that construction workers do not always rely on social support to carry out safety-related tasks. This phenomenon may be due to individual characteristics that tend to be independent or work situations that allow workers to work autonomously without the need for intensive social support. Thus, intrinsic factors such as personal motivation and technical competence may play a greater role in determining occupational safety performance than external support from coworkers or superiors. Based on these findings, it can be concluded that the relationship between social support and occupational safety performance requires further in-depth research using a different methodological approach.

The findings of this study indicate that interpersonal conflict does not significantly influence occupational safety performance. This finding aligns with Ye's (2022) research, which states that interindividual safety conflict does not significantly impact safety performance. One possible explanation for this finding is the high mobility of construction workers, which allows them to avoid working with conflicting coworkers or superiors for extended periods of time. This is due to the ability of interpersonal conflict to disrupt communication, attention, and focus on the work at hand, thereby reducing workers' cognitive capacity to perform work safely. Therefore, prompt and systematic conflict management is essential for employees working, particularly in the construction sector.

Based on case study analysis using the PSIDAR method, it can be concluded that high-risk construction jobs—such as rafter fabrication, sheet installation, rafter lifting and installation, and shell welding—are dominated by high-strain job conditions, namely high work demands with low control and autonomy. Time pressure demands for technical precision, role conflict between speed and adherence to SOPs, low social support, and the emergence of work-family conflict consistently increase work stress, decrease focus, and weaken compliance with safety procedures. In accordance with Job Demands-Resources, the combination of these psychosocial factors significantly increases the risk of accidents and health problems, so that managing psychosocial factors is a primary prerequisite for improving occupational safety performance and reducing accident rates in the construction industry.

Conclusion

Based on the analysis, it was found that not all indicators of psychosocial variables significantly influenced occupational safety performance. Of the six indicators contained in the psychosocial factor variable, only two showed a positive and significant influence: role ambiguity and individual autonomy. Meanwhile, the other four indicators—work stress, work-family conflict, social support, and interpersonal conflict—showed insignificant results. This finding indicates the need for further research to explore the factors that contribute to the insignificant influence of these indicators.

The results of this study provide a theoretical contribution to the development of Job Demand-Resources Theory in the context of the construction industry. Practically, these findings can serve as guidance for the management of PT. Pertamina Maintenance & Construction Balikpapan, particularly the construction division, to optimize factors proven to positively influence occupational safety performance, namely role ambiguity management and increased individual autonomy. Furthermore, the organization needs to conduct in-depth evaluations and develop more effective management strategies for indicators that have not shown significant influences, including work stress management, work-family balance, social support systems, and interpersonal conflict management in the workplace.

References

Alsharef, A., Banerjee, S., Uddin, S. J., Albert, A., & Jaselskis, E. (2021). Early impacts of the covid-19 pandemic on the United States construction industry. *International Journal Of Environmental Research and Public Health*, *18*(4), 1-20.

Bakker, A. B. & Demerouti, E. (2014). Job Demands–Resources Theory. *Wiley*, Chichester.

Bakker, A. B. & Demerouti, E. (2017). Job demands–resources theory: taking stock and looking forward. *Journal of Occupational Health Psychology*, *22*(3), 273-285.

Cullen, J. C., & Hammer, L. B. (2007). Developing and testing a theoretical model linking work-family conflict to employee safety. *Journal of occupational health psychology*, *12*(3), 266.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, *86*(3), 499-512.

Ghafar, M., & Mohamed, E. (2016). Occupational stress: Measuring its impact on employee performance and turnover. *European Journal of Business and Management*, *8*(21), 12-21.

Grill, M., & Nielsen, K. (2019). Promoting and impeding safety–A qualitative study into direct and indirect safety leadership practices of constructions site managers. *Safety Science*, *114*(4), 148-159.

Grzywacz, J. G., & Marks, N. F. (2000). Reconceptualizing the work–family interface: An ecological perspective on the correlates of positive and negative spillover between work and family. *Journal of occupational health psychology*, *5*(1), 111-126.

Hair J, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24.

Hair, J. F. J., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). A primer on partial least squares structural equation modeling (PLS-SEM). Sage Publications.

Idrees, M. D., Hafeez, M., & Kim, J. Y. (2017). Workers' age and the impact of psychological factors on the perception of safety at construction sites. *Sustainability*, *9*(5), 1-15.

ITN (2022). Sektor konstruksi sumbang kecelakaan terbanyak, doktor baru teknik sipil lila ayu ratna winanda buat early warning system secara realtime. *Itn.ac.id*. https://itn.ac.id/2022/02/21/sektor-konstruksi-sumbang-kecelakaan-terbanyak-doktor-baru-teknik-sipil-lila-ayu-ratna-winanda-buat-early-warning-system-secara-realtime/

Jehn, K. A. (1995). A multimethod examination of the benefits and detriments of intragroup conflict. *Administrative Science Quarterly*, *40*(2), 256 – 282

King, T. L., & Lamontagne, A. D. (2021). Covid-19 and suicide risk in the construction sector: preparing for a perfect storm. *Scandinavian Journal of Public Health*, *49*(7), 774-778.

Leung, M. Y., Ng, S. T., Skitmore, M., & Cheung, S. O. (2005). Critical stressors influencing construction estimators in Hong Kong. *Construction Management and Economics*, *23*(1), 33-44.

Li, X., Yi, W., Chi, H. L., Wang, X., & Chan, A. P. (2018). A critical review of virtual and augmented reality (VR/AR) applications in construction safety.

Malinowska, D., Tokarz, A. & Wardzichowska, A. (2018). Job autonomy in relation to work engagement and workaholism: mediation of autonomous and controlled work motivation. *International Journal of Occupational Medicine and Environmental Health*, *31*(4), 445-458.

Mardikaningsih, R., Sinambela, E. A., Retnowati, E., Darmawan, D., Putra, A. R., Arifin, S., ... & Khayru, R. K. (2022). Dampak Stres, Lingkungan Kerja dan Masa Kerja terhadap Produktivitas Pekerja Konstruksi. *Jurnal Penelitian Rumpun Ilmu Teknik*, *1*(4), 38-52.

Maslach, C. & Leiter, M.P. (2008). Early predictors of job burnout and engagement. *Journal of Applied Psychology*, *93*(3), 498-512.

Nwaogu, J. M., Chan, A. P., Hon, C. K., & Darko, A. (2020). Review of global mental health research in the construction industry: a science mapping approach. *Engineering, Construction and Architectural Management*. *27*(2), 264-282.

Pirzadeh, P., & Lingard, H. (2021). Working from home during the covid-19 pandemic: health and well-being of project-based construction workers. *Journal of Construction Engineering and Management*, *147*(6), 1-17.

Raharjo, K., Nurjannah, N., Solimun, S., & Fernandes, A. A. R. (2018). The influence of organizational culture and job design on job commitment and human resource performance. *Journal of Organizational Change Management*, *31*(7), 1346-1367.

Rahman, M. F. W., Kistyanto, A., & Surjanti, J. (2022). Does cyberloafing and person-organization fit affect employee performance? The mediating role of innovative work behavior. *Global Business and Organizational Excellence*, *41*(5), 44-64.

Riyadi, S. (2015). Effect of work motivation, work stress and job satisfaction on teacher performance at senior high school (SMA) throughout The State Central Tapanuli, Sumatera. *IOSR Journal of humanities and social science*, *20*(2), 52-57.

Rodriguez, F. S., Spilski, J., Hekele, F., Beese, N. O., & Lachmann, T. (2020). Physical and cognitive demands of work in building construction. *Engineering, Construction and Architectural Management*. *27*(3), 745-764.

Sampson, J. M., DeArmond, S., & Chen, P. Y. (2014). Role of safety stressors and social support on safety performance. *Safety Science*, *64*, 137-145.

Sunindijo, R. Y., & Kamardeen, I. (2017). Work stress is a threat to gender diversity in the construction industry. *Journal of construction engineering and management*, *143*(10), 1-15.

Tom, C., Amanda & Griffiths (2003). Commentary III: monitoring the changing organization of work: a commentary. *Sozialund Preaventivmedizin*, *48*(6), 354-355.

Tong, R., Wang, L., Cao, L., Zhang, B., & Yang, X. (2021). Psychosocial factors for safety performance of construction workers: taking stock and looking forward. *Engineering, Construction and Architectural Management*, *ahead-of-print*(ahead-of-print), 1-19.

Wang, H., Kamal, E. M., & Ulang, N. M. (2025). The Role of Leader Autonomy Support in Shaping Construction Workers' Safety Compliance: An Application of the Theory of Planned Behavior. *PaperASIA*, *41*(2b), 74-81.

Yang, L. Q., Zheng, X., Liu, X., Lu, C. Q., & Schaubroeck, J. M. (2020a). Abusive supervision, thwarted belongingness, and workplace safety: a group engagement perspective. *Journal of Applied Psychology*, *105*(3), 230-244.

Yang, X., Li, H., Zhang, N., Zhao, H., & Tong, R. (2020b). Evaluation and comparison of the Chinese policy context for safety-related psychological health in the workplace: realities, gaps and challenges. *Journal of Loss Prevention in The Process Industries*, *67*(September 2020), 1-41.

Ye, G., Xiang, Q., Yang, L., Yang, J., Xia, N., Liu, Y., & He, T. (2022). Safety stressors and construction workers' safety performance: The mediating role of ego depletion and self-efficacy. *Frontiers in Psychology*, *12*, 818955.

Yi, T., Dong, Y., & Li, J. (2021). Influence of job insecurity on coal miners' safety performance: the role of emotional exhaustion. *Chinese Management Studies*, *ahead-of-print*(ahead-of-print), 1-17.

Zhu, Y., Quansah, P. E., Obeng, A. F., & Cobbinah, E. (2020). Investigating the effects of role demands, psychosocial stress symptoms and safety leadership on mineworkers' safety performance. *Psychology Research and Behavior Management*, 419-436.