

8-31-2023

Risk Factors Associated with Occupational Stress among Malaysian Construction Professionals

Nur Syafiqah Fauzan

Faculty of Industrial Sciences and Technology, Universiti Malaysia Pahang Al-Sultan Abdullah, Kuantan 26300, Malaysia, syafiqah@umpsa.edu.my

Nur Alia Farahanin Mohd Tajuddin

Faculty of Industrial Sciences and Technology, Universiti Malaysia Pahang Al-Sultan Abdullah, Kuantan 26300, Malaysia, nuraliafarahanin@gmail.com

Neroshini Thanarejee

Faculty of Industrial Sciences and Technology, Universiti Malaysia Pahang Al-Sultan Abdullah, Kuantan 26300, Malaysia, neroshini98.nt@gmail.com

Dayana Hazwani Mohd Suadi Nata

Center for Toxicology and Health Risk Studies, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur 50300, Malaysia, dayanahazwani@ukm.edu.my

Ezrin Hani Sukadarin

Department of Chemical Engineering Technology, Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia, Johor 84600, Malaysia, ezrinhani@uthm.edu.my

See next page for additional authors

Follow this and additional works at: <https://scholarhub.ui.ac.id/mjhr>



Part of the [Mental and Social Health Commons](#), and the [Occupational Health and Industrial Hygiene Commons](#)

Recommended Citation





Fauzan NS, Mohd Tajuddin NAF, Thanarajee N, Mohd Saudi Nata DH, Sukadarin EH, Widia M. Risk Factors Associated with Occupational Stress among Malaysian Construction Professionals. Makara J Health Res. 2023;27.

Risk Factors Associated with Occupational Stress among Malaysian Construction Professionals

Authors

Nur Syafiqah Fauzan, Nur Alia Farahanin Mohd Tajuddin, Neroshini Thanarejee, Dayana Hazwani Mohd Suadi Nata, Ezrin Hani Sukadarin, and Mirta Widia

Risk Factors Associated with Occupational Stress among Malaysian Construction Professionals

Nur Syafiqah Fauzan^{1*}, Nur Alia Farahanin Mohd Tajuddin¹, Neroshini Thanarajee¹, Dayana Hazwani Mohd Suadi Nata², Ezrin Hani Sukadarin³, Mirta Widia^{1,4}

¹Faculty of Industrial Sciences and Technology, Universiti Malaysia Pahang Al-Sultan Abdullah, Kuantan 26300, Malaysia

²Center for Toxicology and Health Risk Studies, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur 50300, Malaysia

³Department of Chemical Engineering Technology, Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia, Johor 84600, Malaysia

⁴Centre for Advanced Industrial Technology, Universiti Malaysia Pahang Al-Sultan Abdullah, Pahang 26600, Malaysia

Abstract

Background: Construction industries that focus on project-based nature, pressure, and long hours may lead to job-related stress among workers. In many emerging nations, robust economic growth plans generate occupational depression, anxiety, and stress among construction industry personnel. This study aims to determine the relationship between these items and the risk factors (demographic) among Malaysian construction professionals.

Methods: A cross-sectional study was carried out among 173 Malaysian construction professionals. A DASS-21 questionnaire is used to survey eligible respondents.

Results: Findings show that construction professionals have a high level of stress (54.9%), anxiety (48.5%), and depression (37%). Gender is significantly associated with stress ($p = 0.000$) and depression ($p = 0.000$). In turn, stress ($p = 0.038$), anxiety ($p = 0.000$), and depression ($p = 0.001$) all demonstrate a significant relationship with health status

Conclusions: Health status is the risk factor most significantly associated with occupational stress. Given the findings, construction managers can help protect their employees and their mental health by promoting a healthy workplace through stress management and social activities.

Keywords: anxiety, construction professionals, depression, occupational stress, risk factors, stress

INTRODUCTION

Construction in Malaysia has a fatality rate of 6.30 per 100,000 employees, which remains the highest of all industries.¹ Construction has a longstanding experience of being highly demanding.² This industry has several characteristics known as three “Ds” (Dirty, Difficult, and Dangerous), which distinguish it from other sectors and emphasize the importance of professional involvement. In addition, evidence suggests that the industry activities engage an increasing number of people with various specializations.³ The constant expansion in the complexity of work and the growing need for increased productivity have become typical in the construction sector, causing a demanding environment for meeting project schedules, quality goals, and cost targets. Thus, construction personnel are constantly challenged by a competitive environment and complex tasks. In such conditions, construction professionals such as architects, project managers, quantity surveyors, and engineers are forced

to work under pressure.⁴ Given the Industrial Revolution 4.0 (IR4.0), stress at work has persisted in Malaysia's construction sector, even though technology advancements are being used to help ease employee-related duties.⁵ As a result, occupational-related depression, anxiety, and stress have become common among construction professionals. The Chartered Institute of Building reported that 68% of construction professionals suffer from depression, anxiety, and stress.⁶

Previous literature has shown that depression, anxiety, and stress may all be related to personal factors,² such as age, gender, income, marital status, occupation, and personality traits that can trigger psychological state symptoms. Anxiety is described as a person's fear of being unable to manage or achieve the intended outcome in upcoming events.⁷ Beck defines depression as cognitive biases and negative self-schemas that maintain the unfavorable triad, a negative and irrational view of ourselves, our future, and the world around us.⁸ For sufferers of depression, these thoughts occur automatically and are symptomatic of depressed people.⁸ Stress is defined as a non-specific response of the body to any demand for change.⁹

In the construction industry, work stressors include negative job environments, unsupportive corporate

*Corresponding author:

Nur Syafiqah Fauzan
Faculty of Industrial Sciences and Technology, Universiti Malaysia
Pahang Al-Sultan Abdullah, Kuantan, Malaysia
E-mail: syafiqah@umpisa.edu.my

culture, unsupportive managers and coworkers, workplace harassment and discrimination, the urge to demonstrate skills, and work pressures.^{6,7} The hot temperature at the construction site, lack of food, poor communication, inadequate staffing, and job demand factors such as excessive work, ambitious deadlines, and pressure are potential work stressors.^{6,10} While these stressors are mainly job-related, personal factors play a role in the occurrence and severity of mental conditions among construction industry professionals.² According to occupational psychology research, personal risk factors such as age, gender, marital status, income, and occupation affect work-related psychological diseases.² Furthermore, Gómez-Salgado *et al.* found that age, inappropriate safety equipment and culture, high workload and responsibilities, financial situation, and lack of knowledge cause stress among construction workers.¹¹

According to recent studies, construction professionals are more prone to experience negative pressure at work, which severely impacts their health and productivity.¹² Such pressure arises when employees face an imbalance between the demands, stressors, or challenges they encounter and the available resources or support to manage these issues adequately. This imbalance can cause unfavorable outcomes for employees and the overall work atmosphere. Work-related stressors in the construction industry may adversely affect individual job performance, decision-making skills, and behavior.^{13,14} According to Ratanasiripong *et al.*, personal characteristics such as age, smoking, work roles, working hours, educational level, sleep, and income significantly correlate with depression, anxiety, and stress.¹⁵ These risk factors are typically neglected and given less attention than work-related concerns.²

Thus, the present study aims to determine the relationship between occupational depression, anxiety, and stress and the risk factors (demographic) among Malaysian construction professionals. Quantity surveyors, site supervisors, safety and environmental officers, civil engineers, and architects are the main research population. The findings could improve the construction industry, particularly construction professionals and management, by providing appropriate guidance, coping skills, and counseling to encourage greater transparency in expressing occupational stress.

METHODS

The University Kebangsaan Malaysia Research Ethics Committee has approved the proposed research methodology (JEP-2022-785). The confidentiality of participants was ensured through the non-disclosure of their names or any personal information in any presentation or publication.

The cross-sectional study was carried out among Malaysian construction professionals who were chosen using a purposive sampling method. Those who have worked in Malaysia for over a year, such as quantity surveyors, site supervisors, safety and environment officers, civil engineers, and architects, are eligible to participate in this study. This criterion is in line with the study done by Inayat and Jahanzeb Khan, where workers with one year of experience and above are selected as respondents.¹⁶ Given the Coronavirus disease 2019 (COVID-19) outbreak in Malaysia, the self-administered questionnaire was distributed online, and data collection of responses took approximately two months. The questionnaire was prepared in a Google Form to facilitate online dissemination and included the consent form and an explanation of the study's purpose and assurances of confidentiality. The representatives from the targeted population were contacted regarding this survey and data collection. The online survey link was shared with targeted construction professionals through social media such as WhatsApp, Facebook, and email. A simple reminder was sent to unresponsive participants one week after the initial distribution to maximize response rates. Then, the online survey response was used to check the number of responses among targeted respondents. Then, the researchers resent the online survey link and instructions to the target respondents via the same social media. The sample size was determined by using the sample-to-variable ratio method. Given that the use of 15–20 observations per independent variable 17 is strongly advised, and thus this study used the ratio of 15:1. Five independent variables are examined, including gender, monthly salary, health status, smoking, and exercise routine. Regarding the above statement, the sample size is ideally 75. However, considering other factors that can cause the data to be invalid, the number of 173 samples was evaluated.

The questionnaire consisted of two sections, namely, sociodemographic risk variables (11 items) and DASS-21 (21 items). The questions were prepared in both English and Malay for the convenience and understanding of respondents, as the industry workers widely speak both languages. The survey was sent in both languages for validation by two experts. Then, a pilot study was carried out among 31 Malaysian construction professionals to assess the survey's internal consistency. Results showed that Cronbach's Alpha is 0.946, indicating a good score. However, such data were excluded from the actual study, given its purpose to assess the feasibility of a strategy that can be used in larger-scale research.¹⁸

Based on previous research, gender, age, marital status, education level, monthly wage, job position, years of working experience, daily working hours, health status, smoking status, and exercise routine were constructed as variables.¹⁵ Using a 4-point Likert scale ranging 0–3, the DASS-21 instrument was developed to assess self-reporting

on occupational stress over the previous week¹⁹. The rating scale was scored as follows: 0 indicates “did not apply to me at all”; 1 indicates “applied to me to some degree or some of the time”; 2 indicates “applied to me to a considerable degree or a good part of the time”; and 3 indicates “applied to me very much or most of the time.”

The data were analyzed using Statistical Packages for Social Sciences version 26.0. The sociodemographic risk factors were calculated in terms of frequency and proportion. The result of DASS-21 is categorized into three: (1) depression, (2) anxiety, and (3) stress. Each primary factor has seven sub-items, yielding a total of 21. The association was determined using the Chi-square test after the data were evaluated for nonnormal distribution using the Kolmogorov-Smirnov test. The chi-square test was assessed using a $p < 0.05$ level of significance.

RESULTS

This study sampled 173 construction professionals, mostly safety and environmental officials (29.5%) and civil engineers (26.6%). Among the respondents, males (56.1%) exceeded females (43.9%). Most respondents are between the ages of 21 and 30 (72.8%). Regarding educational level, 43.9% had earned a diploma, 41.0% had earned a degree, 7.5% attained a master’s degree, 6.4% were high school dropouts, and 1.2% attained doctorates. The respondents earned an average of RM3000 (61.3%), had a work experience of 1–2 years (39.9%), and worked more than eight hours (51.4%) every day. Regarding health, 95.4% reported being in good health, 76.3% as nonsmoking, and 47.4% exercising monthly. For marital status, approximately 80.3% were not married, while 19.7% were married. The results are presented in Table 1.

The DASS-21 scores were classified into normal, mild, moderate, severe, and extremely severe, as indicated in Table 2. Most respondents (63.0%) reported having an average level of depression, while the others reported mild to extremely severe symptoms. The proportion of respondents with normal and abnormal anxiety was significantly different, with 51.4% reporting normal anxiety and 48.5% reporting anxiety ranging from light to extremely severe. Nearly half of the respondents (45.1%) reported having a typical stress level whereas 54.9% reported having a mild to extreme degree of stress.

Furthermore, Table 3 indicates that five out of 11 risk variables were chosen to determine the significant values based on the obtained data. These five risk factors were selected because they were found to have the strongest association with previous literature.^{11,15,20,21} The present study found that the majority of the respondents who had suffered from depression (23.0%), anxiety (31.2%), and stress (31.2%) were male. A significant proportion of respondents with a monthly income of RM3000 reported suffering from depression (23.7%), anxiety (30.0%), and

stress (35.3%). Despite their good health, respondents suffered from depression (32.4%), anxiety (45.1%), and stress (51.4%). Most nonsmokers (28.9%) were suffering from depression, anxiety (39.8%), and stress (43.9%).

TABLE 1. Sociodemographic among professionals in construction industries (N = 173)

Variables	N (%)
Gender	
Male	97 (56.1)
Female	76 (43.9)
Age (in years)	
< 21	23 (13.3)
21 – 30	126 (72.8)
31 – 40	20 (11.6)
41 – 50	4 (2.3)
> 50	0 (0.0)
Marital status	
Unmarried	139 (80.3)
Married	34 (19.7)
Education level	
High school	11 (6.4)
Diploma	76 (43.9)
Bachelor’s Degree	71 (41.0)
Master’s Degree	13 (7.5)
Doctor of Philosophy	2 (1.2)
Monthly salary	
RM 3000	106 (61.3)
RM 3000–5000	44 (25.4)
RM 5001–7000	11 (6.4)
RM 7001– 9000	5 (2.9)
RM 9001–11,000	2 (1.2)
> RM11,001	5 (2.9)
Working position	
Architects	26 (15.0)
Safety & Environment	51 (29.5)
Civil Engineers	46 (26.6)
Quantity Surveyors	27 (15.6)
Site Supervisor	23 (13.3)
Experience working at construction site	
<1 year	50 (28.9)
1–2 years	69 (39.9)
3–5 years	41 (23.7)
6–10 years	9 (5.2)
>10 years	4 (2.3)
Daily working hour	
<8 hours	84 (48.6)
≥8 hours	89 (51.4)
Health status	
Good	165 (95.4)
Poor	8 (4.6)
Smoking status	
Smoker	28 (16.2)
Former Smoker	13 (7.5)
Non-Smoker	132 (76.3)
Exercise routine	
Daily	17 (9.8)
Weekly	74 (42.8)
Monthly	82 (47.4)

TABLE 2. Depression, anxiety, and stress levels of the 173 respondents

Level	Depression N (%)	Anxiety N (%)	Stress N (%)
Normal	109 (63.0)	89 (51.4)	78 (45.1)
Mild	23 (13.3)	26 (15.0)	33 (19.1)
Moderate	14 (8.1)	28 (16.2)	28 (16.2)
Severe	14 (8.1)	21 (12.1)	21 (12.1)
Extremely severe	13 (7.5)	9 (5.2)	13 (7.5)

TABLE 3. Sociodemographic risk factors among professionals in the construction industry

Variables	%	Depression (%)	Anxiety (%)	Stress (%)
Gender				
Male	56.1	23.0	31.2	31.2
Female	43.9	13.9	17.4	17.3
Monthly salary				
RM3000	61.3	23.7	33.0	35.3
RM 3000–5000	25.4	9.3	9.8	12.1
RM 5001–7000	6.4	2.3	5.2	4.5
RM 7001– 9000	2.9	1.2	0	1.2
RM 9001–11000	1.2	0	0	0
>RM11001	2.9	0.6	0.6	0.6
Health status				
Good	95.4	32.4	45.1	51.4
Poor	4.6	4.6	3.5	3.5
Smoking status				
Smoker	16.2	4.6	4.0	6.4
Former smoker	7.5	3.5	4.6	4.6
Non-smoker	76.3	28.9	39.8	43.9
Exercise routine				
Daily	9.8	2.3	2.3	3.5
Weekly	42.8	11.6	20.2	20.8
Monthly	47.4	23.13	26.0	30.6

TABLE 4. Association between occupational depression, anxiety, and stress with the risk factors among professionals in the construction industry

Variables	Depression p^a	Anxiety p^a	Stress p^a
Gender	0.237	0.004*	0.000*
Monthly salary	0.851	0.351	0.547
Health status	0.001*	0.000*	0.038*
Smoking status	0.397	0.062	0.103
Exercise routine	0.104	0.391	0.110

*Significant at $p < 0.05$ (2-tailed), ^a Chi-square analysis

Those who frequently do their exercise routines once a month also suffered from depression (23.13%), anxiety (26.0%), and stress (30.6%).

The chi-square test was used to determine the association between occupational stress (depression, anxiety, and stress) and risk factors, as indicated in Table 4. Significant associations were recorded between gender and stress ($p = 0.000$) and between gender and anxiety ($p = 0.004$). Following that, significant associations were also recorded between health status and depression ($p = 0.001$), anxiety ($p = 0.000$), and stress ($p = 0.038$).

DISCUSSION

The findings show high levels of stress, anxiety, and depression among the respondents. In addition, significant relationships are found between gender and stress, and between gender and anxiety. Stress, anxiety, and depression each demonstrate a significant relationship with health status.

The current results clearly show that the construction industry in Malaysia has more male professionals than females. Even though diverse workplaces are more productive and profitable, the construction industry

continues to be one of the most male-dominated sectors.^{5,22} Males are more likely to suffer from depression, anxiety, and stress, suggesting that they are more influenced by working conditions than females. Moreover, because of their regular load of high-risk responsibilities, men are also more stressed than women.²³

Notably, this study establishes the relationship between gender and mental conditions such as stress and anxiety. Male dominance in the industry may also be vulnerable.²⁴ The lack of natural female characteristics such as calm, comforting, and polite behavior may add value to the industry's support structure, thereby reducing several difficulties.^{2,25} One reason for not handling stress is identified as the male-centric "macho" approach toward getting the job done. This reason is supported by the view that females are more prone than males to participate in a "tend-and-befriend" response to stressors whereas males are likelier to display a "fight-or-flight" response.²⁵⁻²⁷ Admitting to work-related stress is regarded as a show of weakness, and as a result, worry, and anxiety are rarely expressed or acknowledged. Stakeholders in the construction sectors have only seen a small number of cases involving mental illnesses, and really do not keep track of sick leave, causing difficulties in the accurate analyses the current situation.²⁷

According to the data gathered, low monthly wages contribute to the depression, anxiety, and stress among construction professionals. Their financial pressures include price inflation, financial stability in the future, and student loan debts.²² This result can indicate that financial management and salary issues contribute to emotional and mental stress. Certain risk factors are more apparent in females. The reason is that the male connection is a component of manhood and being a woman in such an environment involves a delicate balancing act between efficiently expressing masculinity and discovering new methods to do the same tasks. As a result of these issues, women in the construction industry are less satisfied with their wages and job security.⁵ However, chi-square analysis shows no association between monthly salary and occupational stress (depression, anxiety, and stress) among the respondents, possible because professionals in the construction industry are entitled to higher salaries and benefits than regular employees. Workers in the middle and upper ranks of this industry earn more and advance at a faster rate than craftsmen.²

In addition, the COVID-19 outbreak provided another challenge to the construction industry, as revealed by several factors—a lack of a safe work environment, heavy workloads, family situations, and concerns about job stability—that frequently contribute to anxiety, depression, and even suicide.²⁸ A labor shortage and a multiplicity of regulations to minimize viral spread have affected the number of workers permitted in an area, how staff

performs their responsibilities, and how project managers view the working environment.^{29,30} The lack of a safe working environment results in a stressful working environment and emerging organizational challenges.³⁰ The current results from chi-square analysis show a significant association between health status and depression, anxiety, and stress. Among the construction personnel, the most common health issues were headaches, eyestrain, stress, and musculoskeletal disorders (MSDs).²⁷ The listed health problems are signs of stress. The long hours in the construction industry have resulted in poor eating and sleeping habits, which can contribute to stress.¹⁹ Consequently, sleep problems are associated with fatigue, for which depression is a significant predictor.³¹

The continuous poor condition of mental health secretes stress-related hormones that causes deterioration in the body's general level of biological functioning.³ Therefore, depression, anxiety, and stress can affect health conditions over time. Construction workers have also resorted to exercising as an emotion-focused method to manage stress on a regular basis.^{3,31}

The limitation of this study is this study only measured the depression, anxiety, and stress among Malaysian construction professionals. However, the actual depression, anxiety, and stress were not measured using clinical diagnosis. Moreover, the current health status was determined based on the respondents' perceptions of general health and not through clinical diagnosis. Meanwhile, the risk factors associated with occupational stress only focused on gender, monthly salary, health status, smoking status, and exercise.

Future research is required to further explore the health status issues, such that the medical condition does not become a contributory factor of stress at work. In addition, gender differences also need to be examined due to significant biological differences that are observed in the occurrence of stress and anxiety among respondents. The strategy of support has a noticeably higher effect on levels of job stress among women than men, because males, and females react and respond differently to stress and anxiety. In addition, recognizing, and understanding these gender-specific factors can help tailor support and interventions more effectively, thereby promoting the well-being, and mental health for all employees. Workplace intervention must be accomplished through communication about the professionals' mental conditions. Individual coping techniques, particularly emotional motion-focused strategies, can be utilized to manage concerns that must be addressed immediately following the occurrence of stressors. Problem-focused coping seeks to resolve pressing issues or mitigate their negative consequences, hence lowering levels of depression, anxiety, and stress among construction professionals.

CONCLUSIONS

The current findings indicate that most respondents experience a normal degree of depression, anxiety, and stress. Almost half of the construction professionals have experienced depression, anxiety, and stress in varying degrees of severity. The construction professional must recognize how to cope with depression, anxiety, and stress, including the warning signs, and know the methods to relieve stress such as through healthy eating and exercise. By acknowledging and taking proactive steps to address these issues, employers can create a more supportive and healthier work environment for construction workers. The steps may include providing access to mental health resources, promoting work-life balance, offering stress management programs, and fostering a workplace culture that prioritizes employee well-being. These levels are linked to various risk factors identified in this study. Thus, construction managers can help to protect their employees' mental health by promoting a healthy workplace.

CONFLICT OF INTEREST

No conflicts are declared.

FUNDING

The authors thank the Universiti Malaysia Pahang for providing financial support under Internal Research grant RDU190388.

Received: March 26, 2022 | Accepted: May 18, 2023

REFERENCES

1. Tan ZY, Shide ZY, Kanisawa K, Mine H. Factors in construction accidents and the barriers of safety practices: Perspectives of contractors. *Int J Soc Sci Res*. 2022;4:1-13.
2. Kamardeen I, Sunindijo RY. Personal characteristics moderate work stress in construction professionals. *J Constr Eng Manag*. 2017;143:1-8.
3. Wahab AB. Stress management among artisans in construction industry in Nigeria. *Glob J Res Eng*. 2010;10:93-103.
4. Ng ST, Skitmore RM, Leung TKC. Manageability of stress among construction project participants. *Eng Constr Archit Manag*. 2005;12:264-82.
5. Sunindijo RY, Kamardeen I. Work stress is a threat to gender diversity in the construction industry. *J Constr Eng Manag*. 2017;143:04017073.
6. Campbell F. *Occupational stress in the construction industry*. Bracknell: Chartered Institute of Building, 2006.
7. Samuel OB. The effects of organisational culture and stress on organisational employee commitment. *Management*. 2015;5:96-106.
8. Beck AT, Alford BA. *Depression: Causes and treatment*. 2nd ed. Philadelphia (PA): University of Pennsylvania Press; 2009.
9. Selye H. Stress without distress. In: Serban G. Ed. *Psychopathology of Human Adaptation*. Springer, 1976, p.137-46.
10. Leung M, Chan Y-S, Yuen K-W. Impacts of stressors and stress on the injury incidents of construction workers in Hong Kong. *J Constr Eng Manag*. 2010;136:1093-103.
11. Gómez-Salgado C, Camacho-Vega JC, Gómez-Salgado J, García-Iglesias JJ, Fagundo-Rivera J, Allande-Cussó R, et al. Stress, fear, and anxiety among construction workers: A systematic review. *Front Public Health*. 2023;11:1226914.
12. De Silva N, Samanmali R, De Silva HL. Managing occupational stress of professionals in large construction projects. *J Eng Des Technol*. 2017;15:488-504.
13. Goldenhar LM, Williams LJ, Swanson NG. Modelling relationships between job stressors and injury and near-miss outcomes for construction labourers. *Work Stress*. 2003;17:218-40.
14. Leung MY, Liang Q, Olomolaiye P. Impact of job stressors and stress on the safety behavior and accidents of construction workers. *J Manag Eng*. 2016;32:1-10.
15. Ratanasiripong P, Kaewboonchoo O, Bell E, Haigh C, Susilowati I, Isahak M, et al. Depression, Isahak in Indonesia, Malaysia, Thailand, and Vietnam. *Int J Occup Health Public Health Nurs*. 2016;3:13-29.
16. Inayat W, Jahanzeb Khan M. A Study of job satisfaction and its effect on the performance of employees working in private sector organizations, Peshawar. *Educ Res Int*. 2021;2021: 1751495.
17. Memon MA, Ting H, Cheah J-H, Thuramy R, Chuah F, Cham TH. Sample Size for survey research: Review and recommendations. *J Appl Struct Equ Modeling*. 2020;4:i-xx.
18. Whitehead AL, Sully BG, Campbell MJ. Pilot and feasibility studies: Is there a difference from each other and from a randomised controlled trial? *Contemp Clin Trials*. 2014;38:130-3.
19. Beiter R, Nash R, McCrady M, Rhoades D, Linscomb M, Clarahan M, et al. The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *J Affect Disord*. 2015;173:90-6.
20. Cheon Y, Park J, Jeong BY, Park EY, Oh JK, Yun EH, et al. Factors associated with psychological stress and distress among Korean adults: The results from Korea National Health and Nutrition Examination Survey. *Sci Rep*. 2020;10:15134.
21. Sornsenee P, Kongtragulsub K, Watcharajiranich K, Chantanuwat R, Aungchayakul A, Mangkhalathat K, et al. Factors associated with anxiety and depression among micro, small, and medium enterprise restaurant entrepreneurs due to Thailand's COVID-19-related restrictions: A cross-sectional study. *Risk Manag Health Policy*. 2022;15:1157-65.
22. Langdon RR, Sawang S. Construction workers' well-being: What leads to depression, anxiety, and stress? *J Constr Eng Manag*. 2018;144:1-15.

23. Loosemore M, Waters T. Gender differences in occupational stress among professionals in the construction industry. *J Manag Eng*. 2004;20:126–32.
24. Roche AM, Pidd K, Fischer JA, Lee N, Scarfe A, Kostadinov V. Men, work, and mental health: A systematic review of depression in male-dominated industries and occupations. *Saf Health Work*. 2016;7:268–83.
25. Taylor SE, Klein LC, Lewis BP, Gruenewald TL, Gurung RA, Updegraff JA. Biobehavioral responses to stress in females: Tend-and-befriend, not fight-or-flight. *Psychol Rev*. 2000;107:411–29.
26. Hodes GE. A primer on sex differences in the behavioral response to stress. *Curr Opin Behav Sci*. 2018;23:75–83.
27. Beswick J, Rogers K, Corbett E, Binch S, and Jackson K. *An analysis of the prevalence and distribution of stress in the construction industry*. Buxton, UK: Health and Safety Executive, 2007.
28. Pamidimukkala A, Kermanshachi S. Impact of Covid-19 on field and office workforce in construction industry. *Proj Leadersh Soc*. 2021;2:100018.
29. Choudhari R. COVID 19 pandemic: Mental health challenges of internal migrant workers of India. *Asian J Psychiatr*. 2020;54:102254.
30. Ekpanyaskul C, Padungtod C. Occupational health problems and lifestyle changes among novice working-from-home workers amid the COVID-19 pandemic. *Saf Health Work*. 2021;12:384–9.
31. Chan APC, Nwaogu JM, Naslund JA. Mental ill-health risk factors in the construction industry: Systematic review. *J Constr Eng Manag*. 2020;146:04020004.