HOW DO NON-WORK INDIVIDUAL FACTORS AFFECT WORKER WELL-BEING IN THE CONSTRUCTION INDUSTRY? A SYSTEMATIC REVIEW AND META-ANALYSIS

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Despite the infrastructural developments worldwide, the construction industry is characterised as a stressful industry in which workers suffer from high rates of psychological distress, anxiety and other mental health problems, thus construction workers' psychological well-being (PWB) is a major concern. Although non-work individual factors, including workers' personality, marital status, and non-work experience (such as family support) have been found affecting their work behaviour and PWB, there lacks a holistic nomological network of the underlying associations between these factors and PWB. Therefore, the focus of this paper is to provide a better understanding of the conceptualization of PWB within the construction community and more specifically, to review empirical research on how individual factors affect workers' PWB. We began with clarifying the concepts of PWB and introducing a three-category taxonomy: hedonic, eudaimonic and negative PWB. Through a systematic review of the literature, we then summarised theories and research on how individual factors influence workers' PWB with this three-category taxonomy. An integrative framework was developed with a taxonomy of non-work individual factors and their relations with the three types of PWB. At last, a meta-analysis was conducted to quantify the relations. The findings of this study offer new insights on the main concerns of construction workers' well-being and point to future research on individual and non-work environment support that would improve well-being outcomes in the construction community.

Keywords: meta-analysis; non-work; individual; psychological well-being; systematic

INTRODUCTION

Construction workers' psychological well-being (PWB) is a major concern for the construction industry worldwide (Bowen *et al.,* 2014; Cao *et al.,* 2020), in which workers suffer from high rates of psychological distress, anxiety and other mental health problems (Chan *et al.,* 2020; Pidd *et al.,* 2017). Non-work individual factors, including workers' demographics, personality, and support received from family play a vital role in their work behaviour and PWB (Sang *et al.,* 2007; Tijani *et al.,* 2020).

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However, the pattern through which these non-work individual factors affect employee PWB remains unclear, calling for a systematic review in this domain. This review research aims to better understand the concept of PWB within the construction community and how non-work individual factors affect worker's PWB. This systematic review provides not only an integrative framework to differentiate different types of PWB, but also a detailed demonstration of the research literature on how individual factors relate to each type of PWB. At last, a meta-analysis is conducted to quantify the relations.

Definition

Our review focuses on individual attributes and their impact on PWB of the construction workers. PWB refers to "subjective experience and functioning" (Grant *et al.,* 2007: 53). It has received rising attention and were found related to non-work individual factors, such as age, personality, and previous experience (Bowen *et al.,* 2014; Lian and Ling 2018).

We build upon Inceoglu et al.'s (2018) category of PWB, which includes three types: hedonic, eudaimonic, and negative. The first two types of PWB: hedonic and eudaimonic, both indicate positive functioning. Hedonic PWB emphasizes the subjective experience of pleasure, comprising contentment, comfort, satisfaction, and serenity (Gallagher *et al.,* 2009). Eudaimonic PWB emphasizes subjective vitality, includes positive feeling of aliveness and energy, personal growth, learning and vitality as captured in the concept of thriving (Gallagher *et al.,* 2009). As opposed to these two positive types of PWB, other psychological symptoms and negative well-being indicators, including stress, work-family conflict, and mental health problems and many others, form the third category of PWB: negative PWB (Kotera *et al.,* 2020; Lingard *et al.,* 2012).

Research on how individual factors influence PWB are rooted in the theories of personality and well-being (DeNeve and Cooper 1998) and family interference with work (FIW) (Greenhaus and Beutell 1985). Workers' physical health conditions (Plante and Rodin 1990), marital status (Al-Aameri 2000), and other demographic characteristics (Clark 1997) were found impacting construction workers' experience at work, thus in turn their PWB. On the other hand, factors related to workers' experience in the off-work domain, such as family responsibility (Scandura and Lankau 1997) and relationship with partner (Lambert 1991) could also affect their attitudes and identity at workplace, in turn their satisfaction and engagement. Therefore, in reviewing research in the literature, we broadly categorize non-work individual factors into three aspects: (1) demographic characteristics of workers; (2) personal attributes of workers, including personalities, individual experiences and behaviours that could affect their PWB; and (3) supports that workers received from family that might shape their identity at work.

METHODS

To synthesize the existing wide body of research related to the relationship between non-work individual factors and PWB in the construction industry, the analysis in this study was performed with three phases: Phase 1: selection of research papers; Phase 2: bibliometric analysis and Phase 3: meta-analysis. Phase 1 paper selection sets the boundary conditions of the study with inclusion and exclusion criteria clearly identified for the eligible studies (Booth *et al.,* 2016). Phase 2 bibliometric analysis offers descriptive summary results of the reviewed articles with their journal sources,

theory used, research methods as well as keywords. Phase 3 meta-analysis further examines the relationship between non-work individual factors and three types of PWB variables. Web of Science Core Collection (WOS) and Google Scholar database were used for initial searching. The initial research string was defined using Boolean operators "AND" and "OR". Related PWB keywords include: "well-being", "wellness", "satisfaction", "psychological health", "mental health", "pleasure", "happiness", "burnout", "emotional exhaustion", "stress" and "strain".

Initial paper screening process was conducted by reading the abstracts. In this stage, two selection criteria were applied: (1) only peer-reviewed journal articles were kept for further analysis to ensure the quality of the articles; (2) only articles with PWB related keywords mentioned within the scope of construction industry in their abstracts were kept. As a result, 351 papers were selected for further review. The next step of paper selection is to keep the ones that studied the impact of non-work individual factors on the PWB of construction workers. Therefore, on assessing the full text of the 351 articles, only papers that involve empirical studies where PWB variables were measured as outcome variables and non-work individual factors as predictors were kept. By applying this approach for eligibility check, a total number of 20 articles were finally selected for further analysis. To obtain a static and systematic flow of the research on PWB in the construction industry, the bibliometric analysis was performed to map and visualize the bibliographic information of the 20 articles.

FINDINGS

Journal sources

The reviewed 20 articles come from 13 journals, in which the Journal of Construction Engineering and Management published the most related articles (N = 8) with a total citation of 254. Another 12 articles are from 12 journals, samples of them are International Journal of Project Management, Built Environment Project and Asset Management, Construction Economics and Building, Construction Management and Economics, International Journal of Construction Management, International Journal of Integrated Engineering, International Journal of Managing Projects in Business, Journal of Occupational Health Psychology, and Work and Stress.

Keyword analyses

Keywords represent the core contents of existing studies and describe research topics within a given domain. Co-occurrence of keywords demonstrates the inter-closeness among them. By using "Keywords" and "Fractional counting" in VOSviewer as recommended by Van Eck and Waltman (2017) and by setting the minimum occurrence of a keyword at 2, 56 out of a total of 154 keywords were selected initially. Before this analysis, we removed general keywords such as "construction" and "engineering." The final visualization of co-occurring keywords generated from VOSviewer displays that the occurrence of the keyword "age" was obviously the highest, indicating high focus on this construct. The high frequency constructs in the reviewed papers also include mental health, emotional exhaustion, demand, attitudes, and gender.

Use of theory, research methods and empirical samples

Among the 20 reviewed papers, 16 lacked a theory to explain the linkages between non-work individual factors and PWB. Conversation of resources (COR) theory (Hobfoll 1989) is prevailed in the current literature (N = 3), which was employed to explain the relationships between predictors (e.g., work interference with family,

family role overload) and PWB (e.g., life satisfaction, burnout) (Cheung et al., 2018; Lu et al., 2019). Interaction theory (Lewin 1951) was used by an article, examining the predictive power of age gender and personal values on job satisfaction (Panahi et al., 2016). As to the research methods used in the reviewed research. Structural equation model (N = 5) was used most frequently to analyse the relationships between PWB and non-work individual factors, followed by hierarchical regression analysis (N = 3), and correlation analysis (N = 3). The distribution of the countries or regions, where empirical data were collected in the reviewed papers were also analysed. The number of samples from the Australian (N = 5) and Chinese (N = 5) construction industry ranked the first, followed by the United State (N = 3) and United Kingdom (N = 3). Only one paper used samples from different countries to test the construction professionals' PWB (Cheung et al., 2018).

The Relationship Between Non-Work Individual Factors and PWB

A thorough examination of the relationship between non-work individual factors of the construction workers and their PWB was conducted based on the 20 papers selected.

Non-work individual factors were found affecting construction workers' hedonic PWB by influencing their job satisfaction and life satisfaction in general. Çelik and Oral (2019) discussed in their study that the personality traits of the construction workers showed a positive effect on their job satisfaction levels, and this relationship were partially mediated by work commitment factors and professional commitment. Similarly, Panahi *et al.,* (2016) demonstrated that personal values of construction professionals, as well as the personal and organizational values conflict significantly affected their job satisfaction, moreover, demographic variables of the construction workers explained significant contribution of the variance. More prevailing impact of demographic characteristics, including gender, age, experience and job tenure on employee PWB were widely discovered (Shan *et al.,* 2016). Lian and Ling (2018) explored the influence of personal characteristics on quantity surveyors' job satisfaction, and they claimed that those who were married, older, and more experienced were associated with lower job satisfaction comparing to singles, younger, and less experienced.

Sang *et al.,* (2017) further claimed that female architectural professionals showed a higher level of job dissatisfactions and concerns, indicating poorer occupational health and well-being than their male colleagues. With data collected from 771 blue- and white-collar employees in the construction industry in Australia, Zacher *et al.,* (2014) showed that employees in their late 20s to early 40s had lower job satisfaction than younger and older employees and this curvilinear relationship was fully mediated by work characteristics of time pressure and co-worker support. Besides personality and demographic factors, family issues of the construction workers were found negatively affecting their life satisfaction as well, the negative impact of family-role overload was identified by Lu *et al.,* (2019).

Non-work individual factors of the construction workers are associated with their eudaimonic PWB through the impact on work-life balance and mental health. The influencing mechanism of construction workers' non-work individual factors to their mental health is complex (Dong 2018; Sutherland and Davidson 1993). Dong (2018) explored the factors influencing mental health of migrant workers in the construction industry, where frustration was identified as the risk factor, sleep status and family support the protective factors.

Sutherland and Davidson (1993) revealed the significant differences of Type A and Type B personality on the mental health of construction site managers and Type A exhibited significantly poorer levels. Besides, high tobacco smoking was also associated with poor mental health (Sutherland and Davidson 1993). Notably, although female is widely believed as the more vulnerable party in the construction community (Kamardeen and Sunindijo 2017; Sang et al., 2017), they showed greater capacity in striking a work-life balance and 'switch off' after work (Sang et al., 2007).

Table 1 Non-work individual factors and the three types of PWB.

Non-work individual factors	Hedonic PWB		Eudaimonic PWB		Negative PWB			References
	Job satisfaction (7 articles)	Life satisfaction (1 article)	Mental health (2 articles)	Work-life balance (2 articles)	Stress (5 articles)	Burnout (5 articles)	Psychological symptoms (2 articles)	
Demographic characteristics								
Gender	√			√	√	√	√	Bowen et al. (2014); Kamardeen & Sunindijo, (2017); Panahi et al. (2016); Sang et al. (2017); Sunindijo & Kamardeen (2017)
Age	√				√	√		Bowen et al. (2014); Lian & Ling (2018); Panahi et al. (2016); Zacher et al. (2014)
Profession	√				√			Bowen et al. (2014); Panahi et al. (2016)
marital status	√				√		√	Kamardeen & Sunindijo (2017); Lian & Ling (2018)
Personal characteristics								
Job experience	√							Lian & Ling (2018); Shan et al. (2017)
Personality	√		√		√	√		Celik & Oral, (2019); Cheung et al. (2018); Federle & Maloney (1992); Kamardeen, & Sunindijo, (2017); Leung et al. (2008); Sutherland & Davidson (1993)
Frustration			√					Dong (2018)
Smoking			√					Sutherland & Davidson (1993)
Language barrier					√			Leung & Chan (2012)
Physical health	√		√	√				Dong (2018); Holden & Sunindijo (2018); Shan et al. (2017)
Support received from family								
Family role overload		√						Lu et al. (2019)
Relationship satisfaction (spouse/partner)						√		Lingard (2004)
family support			√					Dong (2018)
poor home environment						√		Naoum et al. (2018)

Besides, non-work individual factors of the construction workers were found associated with their negative PWB, job stress and burnout are two examples of

negative PWB that received much attention. Bowen *et al.,* (2014) claimed the unique contribution from gender, age and profession in predicting occupational stress among construction professionals. More specifically, Kamardeen and Sunindijo (2017) demonstrated that professionals with a status of separated, divorced, or widowed were more easily suffering from severe anxiety, depression, and acute stress; and female professionals reported more anxiety and depression comparing to their male counterparts. Notably, although Type A behaviour was found associating with lower level of mental health (Sutherland and Davidson 1993), Leung *et al.,* (2008) found that Type A behaviour might buffer construction professionals' stress level because of the potential job achievement and satisfaction. As to job burnout and its sources, Cheung *et al.,* (2018) found that workaholism predicted two perspectives of job burnout, emotional exhaustion and depersonalization. Naoum *et al.,* (2018) further discussed that job burnout was positively related to poor home environment. Notably, Lingard (2004) found positive relationship between burnout and relationship satisfaction with spouse/partner. One possible explanation is that, when people derive great fulfilment and satisfaction in their spouse relationship, they place more importance on their family life, thus the inability to spend time with each other due to work demands may strengthen the feelings of burnout, highlighting the fact that job burnout lies in both work and nonwork experiences. Table 1 presents the relationship between non-work individual factors and the three types of PWB.

Meta Statistics

Next, a meta-analysis was conducted to quantitatively summarise how each category of predictors relates to construction worker PWB. Because meta-analysis involves synthesizing effect sizes from 2 or more studies to generate robust effect size estimates, we treated the category of "Personal Characteristics" and "Support from Family" each as one predictor, combining the specific individual predictors under each category. This allows us to quantitatively compare the strength of prediction at the category level in predicting construction worker PWB. Because demographic predictors are rather distinct, age, gender, and marital status were treated as separate predictors. We were not able to meta-analyse the effect size for profession due to its insufficient sample size.

Pearson's correlation r was chosen as the principal measure of effect size. In cases where a correlation value was not included, effect sizes (e.g., Cohen's d or t-score for mean difference comparisons) were converted into correlation r using the formulas described in Wilson and Lipsey (2001). In the end, the meta-analysis included a total of 26 effect sizes from 12 articles. We followed Hunter and Schmidt's (2004) methods for the focal meta-analysis, adopting a random-effects model to estimate between-study variance. Each raw correlation was weighted by sample size (i.e., r) and corrected for internal consistency reliability (i.e., ρ). When the reliability coefficients were not obtainable, mean reliability of the construct was imputed using the formulas developed by Raju *et al.,* (1991). Meta-analysis results were reported in Table 2.

As shown in Table 2, all categories of factors demonstrated correlations with construction worker PWB that were in the moderate range. Specifically, age was positively correlated with PWB ($\rho = 0.122$), indicating that older workers in general enjoy better PWB compared to younger workers. Gender (male = 0, female = 1) was negatively correlated with PWB ($\rho = -0.190$), suggesting that female construction workers have worse PWB compared to male construction workers. Marital status was

shown to have a major influence on construction workers' PWB (ρ = -0.376), and those who are married have worse PWB than those who are not. Characteristics related to worker themselves (i.e., Personal Characteristics), including working experience, personality, and physical health conditions, have a substantial influence on worker PWB (ρ = 0.294). Breaking down each category, the corrected meta-analytic correlation estimate was 0.424 between worker experience and PWB, 0.310 between personality and PWB, and 0.263 between physical health and PWB. All these results indicated that demographic and personal factors are important predictors of PWB in the construction industry and deem more attention.

Lastly, support from family factors, including family roles, home environment, marital satisfaction, were also moderately related to worker wellbeing (ρ = 0.150). Although confidence interval estimates suggest that this point estimate was insignificant, a closer examination of existing estimates revealed the existence of one outlier. Specifically, Lingard (2004) found that relationship satisfaction was positively related to burnout (i.e., negatively related to PWB). The author also pointed it out as a counterintuitive finding and discussed that one possible explanation was that couples who are satisfied with their marriage may place a higher value of spending time with each other, thus the inability to spend time with each other due to work demands may serve as additional sources of burnout. Combining this result with the finding that marital status was negatively correlated with construction workers' well-being, it would be an important future research revenue to explore what kind of support non-work environment could provide to help improve their well-being outcomes.

Table 2: Meta-Analytic Correlations for the Relationships Between Each Predictor Category and Wellbeing.

Factor Category	k	N	r	SD (r)	ρ	SD (ρ)	95% LCI	95% UCI
Demographic-Age	4	1559	0.122	0.115	0.122*	0.105	0.009	0.235
Demographic-Gender	6	1778	-0.179	0.114	-0.190*	0.109	-0.289	-0.091
Demographic-Marital Status	2	112	-0.376	0.005	-0.376*	0.114	-0.382	-0.369
Personal Characteristics	10	1631	0.254	0.105	0.294*	0.087	0.223	0.365
Support from Family	4	612	0.127	0.228	0.150	0.252	-0.112	0.413

*Note: K = number of studies; N = total number of sample size; r = uncorrected correlation; ρ = corrected correlation; 95% LCI and UCI = lower/upper boundary of 95% confidence interval; *significant (confidence internal did not include zero); We based all interpretations on corrected correlations as they reflect 'true' relationships that are free of measurement error.*

CONCLUSIONS

The construction industry is characterised as a stressful industry, workers' PWB is a major concern. Previous review studies on construction workers' well-being usually focus on one aspect of PWB, such as stress (Tijani et al., 2020), strain effects (Bowen et al., 2021) and mental health problems (Chan et al., 2020). There is a lack of frameworks that aim to define different groups of PWB and quantify relationship between PWB indicators in different categories and their predictors. Thus, this study fills this gap by summarising the current PWB studies in the construction industry and sorted them according to a pre-defined categorization of indicators. More specifically, among the predictors of PWB outcomes, this study narrowed its focus on the impact of non-work individual factors on PWB indicators. This study is the first to both

qualitatively and quantitatively review extant research on how non-work individual factors influence different taxonomies of PWB.

Through a systematic review, an integrative framework was developed with different types of PWB: hedonic PWB, eudaimonic PWB and negative PWB as well as their respective associations with non-work individual factors. A meta-analysis further demonstrated the moderate impact of these non-work individual factors on workers' PWB. The findings of this study shed light on the development of coping strategies and mechanisms for the PWB of the construction workers. Coping strategies to protect construction workers' psychological health and mitigate negative outcomes must extend beyond the work environment and take into consideration of work-family interface. Demographic characteristics and personal attributes of the workers must be considered when devising strategies to boost well-being outcomes in the construction community.

REFERENCES

Al-Aameri, A S (2000) Job satisfaction and organizational commitment for nurses, *Saudi Medical Journal*, **21**(6), 531-535.

Ariza-Montes, A, Hernández-Perlines, F, Han, H and Law, R (2019) Human dimension of the hospitality industry: Working conditions and psychological well-being among European servers, *Journal of Hospitality and Tourism Management*, **41**, 138-147.

Bakker A B and Demerouti E (2007) The job demands resources model: State of the art, *Journal of Managerial Psychology*, **22**(3), 309-328.

Bowen, P, Edwards, P, Lingard, H and Cattell, K (2014) Occupational stress and job demand, control and support factors among construction project consultants, *International Journal of Project Management*, **32**(7), 1273-1284.

Bowen, P, Peihua Zhang, R and Edwards, P (2021) An investigation of work-related strain effects and coping mechanisms among South African construction professionals, *Construction Management and Economics*, **39**(4), 298-322.

Cao, J, Liu, C, Zhou, Y and Duan, K (2020) Work-to-family conflict, job burnout and project success among construction professionals: The moderating role of affective commitment, *International Journal of Environmental Research and Public Health*, **17**(8), 2902.

Çelik, G, and Oral, E (2019) Mediating effect of job satisfaction on the organizational commitment of civil engineers and architects, *International Journal of Construction Management*, 1-17.

Chan, A P, Nwaogu, J M and Naslund, J A (2020) Mental ill-health risk factors in the construction industry: Systematic review, *Journal of Construction Engineering and Management*, **146**(3), 04020004.

Cheung, F, Tang, C S, Lim, M S M and Koh, J M (2018) Workaholism on job burnout: A comparison between American and Chinese employees, *Frontiers in Psychology*, **9**, 2546.

Chi, S, Han, S and Kim, D Y (2013) Relationship between unsafe working conditions and workers' behaviour and impact of working conditions on injury severity in US construction industry, *Journal of Construction Engineering and Management*, **139**(7), 826-838.

Clark, A E (1997) Job satisfaction and gender: why are women so happy at work? *Labour Economics*, **4**(4), 341-372.

DeNeve, K M and Cooper, H (1998) The happy personality: A meta-analysis of 137 personality traits and subjective well-being, *Psychological Bulletin*, **124**(2), 197-229.

Dong, R R (2018) Study on mental health status and life quality of migrant workers in construction industry, *Journal of Environmental Protection and Ecology*, **19**(4), 1864-1872.

Federle, M O and Maloney, W F (1992) Substitutes for leadership and unionized construction carpenters, *Journal of Construction Engineering and Management*, **118**(2), 332-348.

Gallagher, M W, Lopez, S J and Preacher, K J (2009) The hierarchical structure of wellbeing, *Journal of Personality*, **77**, 1025-1050.

Grant, A M, Christianson, M K and Price, R H (2007) Happiness, health, or relationships? Managerial practices and employee well-being trade-offs, *Academy of Management Perspectives*, **21**, 51-63.

Greenhaus, J and Beutell, N (1985) Sources of conflict between work and family roles, *Academy of Management Review*, **10**(1), 76-88.

Hobfoll, S E (1989) Conservation of resources: A new attempt at conceptualizing stress, *American Psychologist*, **44**(3), 513-524.

Hunter, J E and Schmidt, F L (2004) *Methods of Meta-Analysis: Correcting Error and Bias in Research Findings*, London: Sage.

Inceoglu, I, Thomas, G, Chu, C, Plans, D and Gerbasi, A (2018) Leadership behaviour and employee well-being: An integrated review and a future research agenda, *The Leadership Quarterly*, **29**(1), 179-202.

Kamardeen, I and Sunindijo, R Y (2017) Personal characteristics moderate work stress in construction professionals, *Journal of Construction Engineering and Management*, **143**(10), 04017072.

Kotera, Y, Green, P and Sheffield, D (2020) Work-life balance of UK construction workers: Relationship with mental health, *Construction Management and Economics*, **38**(3), 291-303.

Lambert, S J (1991) The combined effects of job and family characteristics on the job satisfaction, job involvement and intrinsic motivation of men and women workers, *Journal of Organizational Behaviour*, **12**(4), 341-363.

Leung, M Y and Chan, I Y S (2012) Exploring stressors of Hong Kong expatriate construction professionals in Mainland China: Focus group study, *Journal of Construction Engineering and Management*, **138**(1), 78-88.

Leung, M Y, Chan, Y S, Chong, A and Sham, J F C (2008) Developing structural integrated stressor-stress models for clients' and contractors' cost engineers, *Journal of Construction Engineering and Management*, **134**(8), 635-643.

Lewin, K (1951) *Field Theory in Social Science*, New York: Harper.

Lian, J K and Ling, F Y (2018) The influence of personal characteristics on quantity surveyors' job satisfaction, *Built Environment Project and Asset Management*, **8**(2), 183-193.

Lingard, H (2004) Work and family sources of burnout in the Australian engineering profession: Comparison of respondents in dual-and single-earner couples, parents and nonparents, *Journal of Construction Engineering and Management*, **130**(2), 290-298.

Lingard, H, Francis, V and Turner, M (2012) Work time demands, work time control and supervisor support in the Australian construction industry, *Engineering, Construction and Architectural Management*, **19**(6), 647-665.

Lipsey, M W and Wilson, D B (2001) *Practical Meta-Analysis*, New York: SAGE publications, Inc.

Lu, R, Wang, Z, Lin, X and Guo, L (2019) How do family role overload and work interference with family affect the life satisfaction and sleep sufficiency of construction professionals? I*nternational Journal of Environmental Research and Public Health*, **16**(17), 3094.

Naoum, S G, Herrero, C, Egbu, C and Fong, D (2018) Integrated model for the stressors, stress, stress-coping behaviour of construction project managers in the UK, *International Journal of Managing Projects in Business*, **11**(3), 761-782.

Panahi, B, Moezzi, E, Preece, C N and Wan Zakaria, W N (2016) Personal-organisational value conflicts and job satisfaction of internal construction stakeholders, *Construction Economics and Building*, **16**(1), 1-17.

Pidd, K, Duraisingam, V, Roche, A and Trifonoff, A (2017) Young construction workers: Substance use, mental health and workplace psychosocial factors, *Advances in Dual Diagnosis,* **10**(4), 155-168.

Plante, T G and Rodin, J (1990) Physical fitness and enhanced psychological health, *Current Psychology*, **9**(1), 3-24.

Raju, N S, Burke, M J, Normand, J and Langlois, G M (1991) A new meta-analytic approach, *Journal of Applied Psychology*, **76**(3), 432-446.

Sang, K J, Dainty, A R and Ison, S G (2007) Gender: A risk factor for occupational stress in the architectural profession? *Construction Management and Economics*, **25**(12), 1305-1317.

Scandura, T A and Lankau, M J (1997) Relationships of gender, family responsibility and flexible work hours to organizational commitment and job satisfaction Journal of Organizational Behaviour: *The International Journal of Industrial, Occupational and Organizational Psychology and Behaviour*, **18**(4), 377-391.

Shan, Y, Imran, H, Lewis, P and Zhai, D (2017) Investigating the latent factors of quality of work-life affecting construction craft worker job satisfaction, *Journal of Construction Engineering and Management*, **143**(5), 04016134.

Sunindijo, R Y and Kamardeen, I (2017) Work stress is a threat to gender diversity in the construction industry, *Journal of Construction Engineering and Management*, **143**(10), 04017073.

Sutherland, V and Davidson, M J (1993) Using a stress audit: The construction site manager experience in the UK, *Work and Stress*, **7**(3), 273-286.

Tijani, B, Jin, X and Osei-Kyei, R (2020) A systematic review of mental stressors in the construction industry, *International Journal of Building Pathology and Adaptation*, **39**(2), 433-460.

Van Eck, N J and Waltman, L (2017) *Vosviewer Manual for Vosviewer Version 1.6.6.*

Wang I M, Sinclair R R and Tetrick L E (2013) How to think about and measure psychological well-being: Research methods in occupational health psychology: Measurement, design and data analysis, *In*: M Wang, R R Sinclair and L E Tetrick (Eds.) *Research Methods in Occupational Health Psychology*, New York: Psychology Press/Routledge.

Zacher, H, Jimmieson, N L and Bordia, P (2014) Time pressure and co-worker support mediate the curvilinear relationship between age and occupational well-being, *Journal of Occupational Health Psychology*, **19**(4), 462-475.