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STRESS-COPING STRATEGIES AMONG CONSTRUCTION PERSONNEL: AN INTEGRATIVE REVIEW

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Construction personnel are faced with a considerable amount of stress, which negatively impacts their health and well-being. This has spurred research into stress and mental health in the industry. However, studies reviewing stress-coping strategies adopted by construction personnel are lacking. The study integratively reviewed articles on stress-coping strategies among construction personnel to determine the coping strategies employed in the industry and the effect of such strategies on personnel's performance and health. The database of PubMed, Scopus, and Web of Science was searched to retrieve relevant literature within the period 1990 to 2020. Using the PRISMA guidance and CEBM critical appraisal tool, a total of nineteen studies met inclusion criteria. The literature on stress-coping strategies was classified into four categories: family, mental ill-health, workplace stressors, and coping strategy influencers. Project performance increased with the adoption of problem-focused coping and emotion-focused coping behaviors. Cultural values, income, and motivation influenced the type of coping strategy adopted. Problem-focused coping strategies (particularly active coping, social support, religion, and positive reappraisal) alleviated depression, anxiety, and stress. This study informs on appropriate methods and policies for researching stress-coping strategies in the construction industry. There is a need for investigations into resilience as a coping resource, future-oriented stress-coping along the generational gap, and assessment of stress-coping interventions on a "pre and post-intervention" and "short and long time" basis.

Keywords: construction personnel, coping strategies, generational gap, stress, workplace

INTRODUCTION

Stress is a common factor in the everyday hustle and bustle (Labrague et al., 2018) and specifically related to the construction industry (Love et al., 2010). Such stress has its root in increased work pace resulting from globalization and the role the industry plays in the process (Aitken and Crawford, 2007, Chan et al., 2018). The massive demand for the delivery of infrastructures and structures has made the construction industry home to extreme and counterproductive work stress (Sunindijo and Kamardeen, 2017). Construction professionals and site operatives

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are subjected to work stressors that negatively impact their health and performance (Bowen et al., 2014, Love et al., 2010, Ojo et al., 2019, Sunindijo and Kamardeen, 2017). Effects of work stress include: (i) mental ill-health (e.g., depression, anxiety, suicidality), (ii) physical ill-health (e.g., headaches, body pains, blood pressure, cardiovascular disease), (iii) low job satisfaction, and (iv) reduced performance (Bowen et al., 2014, Chan et al., 2018, Desjarlais, 1995).

Sources of stress within the construction industry include; time pressures, poor physical work environment, long work hours, work-family/life conflict, low income, organizational culture, job insecurity, interpersonal conflict, little social support from colleagues, bullying, harassment, and gender discrimination (Bowen et al., 2014, Love et al., 2010, Ojo et al., 2019, Sunindijo and Kamardeen, 2017, Leung et al., 2016, Leung et al., 2006). Work stress is a problem for both individuals and organizations (Hannigan et al., 2004). The effect of work stress has been evidenced in the construction industry, as they suffered substantial suicide rates above the general population (Milner et al., 2015, Peterson et al., 2018, Rees-Evans, 2020). In order to withstand the stress and mitigate its adverse impact, construction personnel must engage varying coping strategies. According to Labrague et al. (2017), "coping mechanisms are necessary when dealing with stress and accompanying stressors".

Based on the preceding, this integrative review appraised and synthesized previous studies to deduce stress-coping strategies employed by construction personnel to deal with stress. In order to achieve this aim, the specific objectives are to (i) determine the coping strategies unique to construction professionals and operatives; (ii) determine the effect of coping strategies on performance and the health of construction personnel. This review informs future research and construction organizations on possible coping mechanisms that are more likely to be employed by the two-primary class of construction personnel (professionals and operatives), their health, and performance outcomes. It also informs on research directions which should be target points, thereby giving room for the cross-cultural analysis of coping strategies with the possibility of developing a cross-cultural stress management intervention.

LITERATURE REVIEW

While available evidence (Rees-Evans, 2020, Campbell, 2006) shows that stress and its related outcomes are predominant in the construction industry, reviews on coping strategies, an important construct in the stress and well-being process, are lacking. Although there have been reviews on stress or its outcomes in the industry (Nwaogu et al., 2019, Tijani et al., 2021), none has reviewed coping strategies among construction personnel. Tijani et al. (2021) focused on the classification of stressors and their impact on occupational stress among construction personnel. They recommended the need for considering the role of stressors emanating from the tendering process and the physical work environment on the stress level of workers. Using a scientometric review, Nwaogu et al. (2019) linked mental ill-health to occupational stress in the industry. They emphasized the role of coping strategies as protective factors against the development of mental ill-health.

Burnout, depression, and anxiety have been related to coping strategies (Brenda and Steve, 2006, Haynes and Love, 2004, Langdon and Sawang, 2018). Coping moderates psychosocial factors that an employee is subjected to daily (Brenda and Steve, 2006). Based on the preceding, it is expedient to review how construction personnel in varying economies in the extant literature cope with or manage such stressors and work stress. This will provide information on coping strategies prevalent among construction personnel and the triggers for adopting each strategy. This information would highlight a direction for future research and necessary interventions.

Explanation of terms

Coping strategies refer to the strategies employed to deal with the psychological impact of stress and its health or performance outcome (Folkman et al., 1986). It refers to an individual's conscious effort to withstand, deal with, or overcome a stressful event (Lazarus and Folkman, 1984). According to Folkman et al. (1986), coping strategies serve two primary functions, namely: (i) the regulation of stressful emotions and (ii) alteration of the distress-causing person-environment relationship.

Coping strategies that directly manage a stressor or cluster of stressors are called problem-focused strategies, while those that regulate emotions that arise due to a stressful situation are referred to as emotion-focused strategies (Biggs et al., 2017, Lazarus and Folkman, 1984).

Problem-focused coping is adaptive in nature and behavioral. It involves a person taking positive efforts to assess and solve the stress problem in a logical manner. On the other hand, emotion-focused coping is maladaptive and involves the use of cognitive strategies in trying to reduce psychological distress (Lazarus and Folkman, 1984). Emotion-focused can be described as maladaptive or escapist because the effect is temporary and does not entirely solve the stress. They include denial (Bowen et al., 2014, Langdon and Sawang, 2018). However, the effectiveness of a coping strategy or behavior is determined by fit and context because it depends on how appropriately it corresponds with appraisals and specific conditions (Biggs et al., 2017).

METHODS

Design

The integrative review approach was adopted to examine diverse literature on coping with stress in the construction industry. The review method was considered appropriate due to its ability to allow the inclusion and synthesizing of literature that employed qualitative and quantitative methodologies (Labrague et al., 2018). The review began with a systematic search of existing literature in three databases using keywords. Thereafter, a manual search of specific studies identified from citations and reference lists of previously retrieved articles was conducted using google scholar. To ensure the quality of findings, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines were employed to select articles fit to be reviewed.

Search strategy

The search for literature was conducted in three phases: first, the databases of PubMed, ISI Web of Science (WoS) core collection, and Scopus were visited on March 2021 to retrieve articles for the review. These databases were consulted as they contained the largest concentration of articles in various fields which have undergone rigorous peer review: (i) PubMed for health-related journals (Harris et al., 2014), and (ii) WoS and Scopus for science-related journals (Aghaei Chadegani et al., 2013). Several search strings were combined; those with the best result are ''stress'' ''coping'' ''construction industry''; "individual resilience," "construction industry," "stress," "personal resources."

Second, to ensure that no critical article was omitted in the retrieval process, the databases of three top science citation indexed journals in the field of construction and engineering were visited to retrieve articles that might be missed out in the first process. The journals are Engineering, Construction and Architectural Management (ECAM), Journal of Construction Engineering and Management (JCEM), and Journal of Management in Engineering (JME). The three construction and engineering-related journals 'database was searched because Naoum et al. (2018) showed the journal outlets accounted for approximately 73% of the total stress-related articles in the construction industry. As regards this research field, the journals satisfy the 80/20 Pareto principle. Figure 1 shows the flow diagram of the process utilized for identifying the relevant literature.

Inclusion and exclusion criteria

For an article to be eligible for review, the following inclusion criteria were set. The studies had to:

i. discuss stress-coping strategies among construction personnel (construction professionals or tradesmen).

ii. not limited to any organization structure within the industry

iii. be an empirical study and not a preliminary study

iv. be a journal article

v. published between the year 1990 and 2020

vi. be written in the English language

Apart from the failure to meet the inclusion criteria, studies that considered (i) a specific coping construct, (ii) a particular organizational structure were excluded. Measures of depression and anxiety were not considered for exclusion to provide an insight into coping strategies which have been employed by construction personnel in different psychological health conditions. The studies reviewed employed quantitative or qualitative methodologies to elicit stress-coping strategies.

Search outcome

A total of 222 articles (WoS = 20; PubMed = 7; Scopus = 32; JCEM = 53; JME = 65; ECAM = 45) were retrieved from the initial database search. Duplicates were removed using the endnote reference management software through the "find

duplicates" option. After removing duplicates, a total of 163 articles were subjected to scrutiny using the inclusion criteria. Three additional articles that met inclusion criteria were identified from the citation and reference list of the studied articles. Thereafter, a total of 19 publications were fit for the study (see Figure 1).

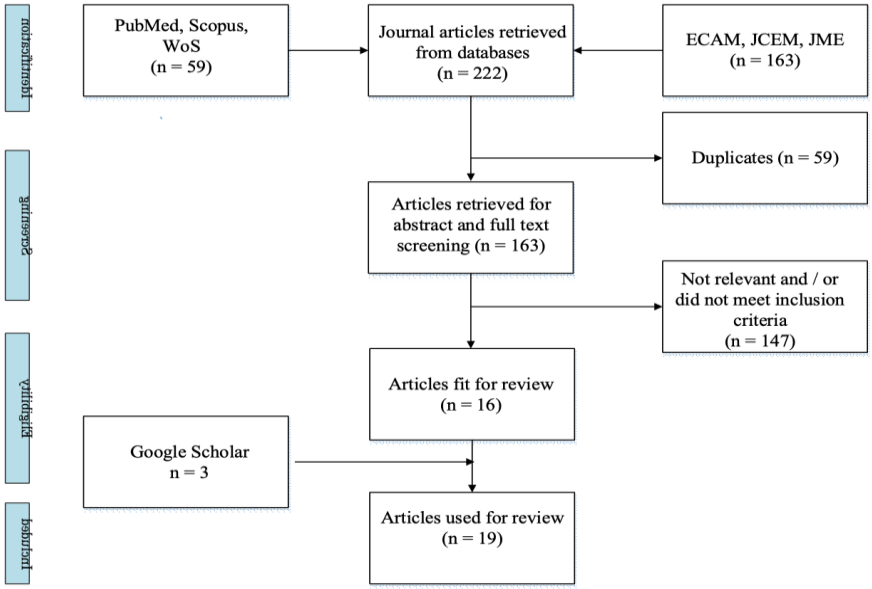

Figure 1. PRISMA Flow diagram for identification of studies used for review.

RESULTS

The remaining sections of this study outline the result, discussion of the findings, the study limitations, and conclusions. The result section details the study characteristics, research instruments utilized by the studies, and the themes into which the studies on coping can be classified.

Study characteristics

Nineteen studies were included in the review. Eight of the studies were from Asia: Hong Kong SAR (Leung et al., 2006, Liang et al., 2018, Brenda and Steve, 2006, Chan et al., 2014, Yip et al., 2008), China (Chan et al., 2018, Chan et al., 2012) and Korea (Lim et al., 2017). Four studies from Australia (Haynes and Love, 2004, Langdon and Sawang, 2018, Sunindijo and Kamardeen, 2017, Lingard and Francis, 2008). Three studies were from the United Kingdom (Davidson and Sutherland, 1992, Naoum et al., 2018, Sommerville and Langford, 1994), two studies from Nigeria (Ojo et al., 2019, Oladinrin et al., 2014), and one study each from South Africa (Bowen et al., 2014) and Palestine (Enshassi et al., 2018). All the studies were cross-sectional, out of which the majority (twelve) utilized the quantitative technique, one (1) mixed-method, and six (6) employed qualitative techniques in assessing stress-coping strategies.

Instruments

Coping strategies adopted by construction personnel to manage stress were measured using quantitative and qualitative methods. Nine (9) of the studies quantitatively elicited information on coping strategies using a psychometric coping construct scale or adapting such coping scales to fit the construction industry context. Two (2) of the nine studies employed Brief Coping Orientation to

Problems Experienced Inventory (BCI). Four (4) studies measured coping methods by using the Ways of Coping Questionnaire (WCQ). Two (2) studies utilized the simplified version of the Ways of Coping Questionnaire (WCQ-R), while other studies derived their coping questionnaire from the WCQ, different coping scales, or previous studies in construction.

Four (4) out of the studies utilized a stress measurement scale, while others developed a questionnaire to elicit such information. The stress scales were used to evaluate stress severity and include Korea Occupational Stress Scale-Short Form (KOSS-SF) (Lim et al., 2017), Depression Anxiety Stress Scale (DASS) (Haynes and Love, 2004, Langdon and Sawang, 2018, Sunindijo and Kamardeen, 2017). In addition to the stress and/or coping scales, some studies utilized other scales to measure mental health symptoms (Haynes and Love, 2004, Langdon and Sawang, 2018, Lim et al., 2017, Sunindijo and Kamardeen, 2017), burnout (Yip et al., 2008), culture value (Chan et al., 2014) and social support (Davidson and Sutherland, 1992).

Coping

The studies employed different terms to describe the coping strategies as varying methodologies and coping psychometric instruments were employed. The articles were analyzed using the thematic analysis approach as described by Braun and Clarke (2006) and Labrague et al. (2018). Following that, four themes were identified from the literature on stress-coping strategies, which formed the basis for grouping the studies:

(i) Family commitment related coping strategy

Lingard and Francis (2008) focused on the adaptive coping strategies employed by working couples within the construction profession to withstand work-family imbalance. The adaptive coping strategies employed are the scaling back strategy (i.e., "trading-off" strategy and "job versus career") and work-hour commitment strategy. The work-hour commitment employed include "neo-traditionalist" (40%), "alternative commitment" (34.7%), "dual moderates" (21%), "high commitment" (2.7%), and "crossover commitment" (1.4%). The work-hour commitment differed between gender, as females employed mostly "dual moderates" while the men used the "neo-traditionalist."

(ii) Coping strategies and mental ill-health symptoms

Four studies examined the coping strategies employed by construction employees to manage poor mental health symptoms following work stress exposure (Haynes and Love, 2004, Langdon and Sawang, 2018, Lim et al., 2017, Sunindijo and Kamardeen, 2017). The strategies included a range of problem-focused and emotion-focused strategies. For instance, among construction professionals, a higher depression level was related to adopting high levels of avoidance coping, while an active coping strategy reduced depression (Haynes and Love, 2004). Also, Sunindijo and Kamardeen (2017) found that depression and anxiety correlated negatively with active coping, social support, and religious coping behaviors. In contrast, positive reappraisal correlated negatively with depression and anxiety (Sunindijo and Kamardeen, 2017). Lim et al. (2017) reported that construction tradesmen used more active coping strategies (consisting of problem-focused

coping, social support coping styles) than passive coping strategies (emotion-focused coping styles).

Among construction tradesmen, adaptive strategies partially mediate stress (Langdon and Sawang, 2018). The study opined that adaptive strategies seemed unhelpful to the tradesmen, as both adaptive and maladaptive coping strategies had low mean scores. However, maladaptive coping skills (especially self-blame and substance abuse) were used to relieve anxiety by construction tradesmen (Langdon and Sawang, 2018).

(iii) Workplace stressors and coping strategies

Ten studies evaluated the coping strategies employed to withstand work stress among construction employees (Bowen et al., 2014, Chan et al., 2012, Enshassi et al., 2018, Liang et al., 2018, Naoum et al., 2018, Brenda and Steve, 2006, Davidson and Sutherland, 1992, Sommerville and Langford, 1994, Yip et al., 2008, Leung et al., 2006). For instance, Naoum et al. (2018) found that poor organizational structures were positively related to problem-focused coping behavior (particularly thinking action) and emotion-focused coping (i.e., avoiding action). Likewise, physiological stress had a significant positive correlation with problem-focused coping behavior (alternative thinking), while poor home environment correlated positively with emotion-focused coping behavior (emotional discharge).

Using a qualitative technique, Liang et al. (2018) reported that construction tradesmen adopted mostly emotion-focused coping styles. Such emotion-focused coping includes alcohol consumption, smoking, and expressing negative feelings. Using quantitative techniques, four (4) studies (Brenda and Steve, 2006, Leung et al., 2006, Naoum et al., 2018, Yip et al., 2008) reported that construction professionals tended to use problem-focused coping such as rational problem-solving and direct and control action. Such direct and control actions include "trying different ways in solving a problem," "thinking about the event and learning from the mistake," and "considering several alternatives in handling a problem" (Leung et al., 2006).

Seven studies did not report based on the coping strategy construct, which was mostly employed (Bowen et al., 2014, Chan et al., 2012, Davidson and Sutherland, 1992, Enshassi et al., 2018, Ojo et al., 2019, Oladinrin et al., 2014, Sommerville and Langford, 1994). However, behaviors employed includes ignoring telephone calls, exercise, music, reading books, crying, eating, smoking, sleeping/resting, walking, scolding others, thinking of unrelated things, and attending social functions (Chan et al., 2012, Enshassi et al., 2018, Ojo et al., 2019, Oladinrin et al., 2014).

(iv) Influencers of the choice of coping strategy

Three studies (Leung et al., 2006; Chan et al., 2014; Chan et al., 2018) found that cultural values and motivation influenced the choice to adopt a particular coping strategy in the face of stress. Chan et al. (2014) indicated that cultural values (particularly interpersonal integration and disciplined work ethos) influenced the choice of coping strategies. For instance, professionals who emphasized interpersonal integration adopted the problem-focused coping strategy, particularly planful problem-solving. Interpersonal integration predicted planful problem solving; disciplined work ethos, positively predicted positive reappraisal, and negatively predicted emotional discharge.

Chan et al. (2018) found that stress expectancy, performance expectancy, and valence of performance were motivations to employing specific coping strategies. An earlier study (Leung et al., 2006) reported that project performance correlated positively with problem-focused coping strategies (i.e., direct and control action, preparatory action), and emotion-focused coping (negative emotional discharge), while a negative correlation existed between project performance and emotion-focused behaviors (e.g., escape coping).

DISCUSSION

This review included 19 articles on stress-coping strategies among construction personnel. It outlines some highlighted effects of stress, the coping strategies employed in the face of stress, factors that influence the type of coping strategy employed, and the impact of coping strategy on performance. Although the studies can be grouped to cover four themes, some gaps were observed. The gap includes the research methodology adopted by the studies. As earlier identified, a number of diverse instruments were employed that may affect the generalization, comparison, and validity of findings. Some effects of stress highlighted by the studies were mental health problems (depression, anxiety), physiological strain, and task performance related (reduced work effectiveness, hasty decision making, poor critical thinking, and mistakes). Other consequences of stress on performance, especially among construction tradesmen, were reduced work quality, reduced work speed, poor interpersonal performance, intention to leave, and increased work accidents (Liang et al., 2018).

Coping strategies and mental ill-health symptoms

The studies showed that both tradesmen and professionals adopted problem-focused coping and emotion-focused coping strategies. However, tradesmen, especially those with lower pay, tend more to adopt emotion-focused strategies (Lim et al., 2017). The utilization of emotion-focused coping behaviors by construction frontline workers could be linked to low job control and inadequate knowledge of effective problem-solving techniques. As regards health, mental ill-health symptoms (particularly depression and anxiety) were found to reduce with the use of problem-focused coping strategies (Sunindijo and Kamardeen, 2017), while the use of substance abuse alleviated anxiety among construction tradesmen (Langdon and Sawang, 2018).

Few of the studies adopted or adapted coping construct scales. The studies that utilized the qualitative methodology analyzed their findings through inductive content or thematic analysis, using previous studies and validated coping questionnaires (WCQ) as a guide. It was difficult to appropriately compare the findings of the studies as they used different constructs to elicit information on coping strategies. The coping assessment tools varied in content and structure. For instance, the acceptance variable in BCI construct reads as "accepting this happened," "learning to live with it" and is classified as an adaptive strategy (problem-focused), while in the WCQ construct, the acceptance variable is a maladaptive strategy. This difference in content and structure hinders for proper comparison of the research findings.

The studies utilized varying themes for some coping constructs. For instance, Leung et al. (2006) had problem-focused coping construct as direct and control action, instrumental support seeking, and preparatory action, while Naoum et al. (2018) had the problem-focused coping construct as control action, thinking action, support seeking, and alternative thinking. The study also found that while some studies (Sommerville and Langford, 1994, Davidson and Sutherland, 1992, Bowen et al., 2014) classified healthy behaviors including exercising and sporting activities as adaptive strategies (or active strategies), some others termed them as maladaptive (avoidance or emotion-focused coping). The use of a unified coping construct scale could enhance better comparison, interpretation, and summary of results. There is a need for research into occupational psychology to develop reliable and validated coping constructs whose wordings are specific to the construction industry context.

Data collection methodology adopted by the majority of the study was of low quality. Studies with high methodology are needed; this will improve the quality of evidence. Presently only a few studies meet high methodology quality. Further studies into stress and coping in the construction industry can benefit from employing mixed-method techniques where the qualitative component should be analyzed using inductive content or thematic analysis. Following that, stress and coping reactions are highly subjective and affected by perception, investigation into stress-coping would benefit from qualitative narratives to better understand how construction personnel handles stress. All the studies reviewed focused on how construction personnel cope with past or present stressors; it is unknown how they will cope with anticipated future stressors. Thus, there is a need for studies to consider future-oriented stress-coping strategies. Such information could improve the quality of coping resources and training in the construction industry.

Family commitment related coping strategy

The study revealed that coping strategies employed among working couples to mitigate work-life/family imbalance were adaptive and differed from those employed individually. There are indications that the highest quality of life is recorded among couples who adopt "dual moderates" and "alternate commitments" work hours strategies than those who engage the "neo-traditional" strategy (Lingard and Francis, 2008, Moen and Yu, 2000). Studying the effect of work hours and family is most appropriate when considering that a couples 'ability to cope with stress effectively requires two people (Matthews et al., 2006). More so, in today's world, couples tend to work (Jacobs and Gerson, 2001). Therefore, with the surge in information technology and its influence on work and life, it would be important to study stress-coping strategies employed by married construction professionals, in line with the generation gap and its effect on health and well-being. Such studies would enable drawing conclusions that will inform sustainable job design, job satisfaction, and improved physical, mental health and well-being.

Choice of coping strategies

This study deduced that a few factors influenced construction professionals 'choice for a specific coping strategy. These factors (cultural values and motivation) acted in the capacity of an antecedent and a facilitator. The cultural values are interpersonal integration and disciplined work ethos. Interpersonal integration such as trustworthiness, patience, sincerity influenced the adoption of the

problem-focused coping strategy, particularly planful problem-solving (Leung et al., 2010). In comparison, disciplined work ethos such as persistence, prudence, knowledge, and resistance to corruption prevented the use of emotion-focused coping (especially emotional discharge) and enhanced the use of a problem-focused coping strategy (Chan et al., 2014, Leung et al., 2010).

The motivation to adopt a particular coping strategy (or strategies) in the face of stress was related to stress expectancy, performance expectancy, and valence of performance. According to Chan et al. (2018), the motivations are stress expectancy (effective stress reduction, increasing problem-solving abilities, maintain a clear mind), performance expectancy (increase task performance), and valence of performance. The study noted that the choice of coping strategy imparted on performance outcomes. The categories of performance were task performance (project performance, poor process performance), interpersonal performance (good cooperation, negative interpersonal relationship), and organization performance (poor organization relationship).

Project performance increased due to the adoption of "direct and control action" problem-focused strategy, and "negative emotional discharge" emotion-focused coping strategy (such as smoking, taking more tranquilizers) (Leung et al., 2006). Also, the use of "instrumental support" such as seeking support from colleagues improved project performance." On the other hand, escape coping behavior negatively affected project performance. This implies that the kind of performance which a construction employee desires to see motivates them to adopt specific coping strategies.

Presently, there are few studies into copings strategies that considered the effect of personal resources, particularly self-efficacy, self-esteem, or resilience, on the choice of coping strategies adopted by construction personnel. There is a need for stress-coping studies among construction personnel to consider these personal resources construct, their influence on coping strategies, and related impact on health, well-being, and performance. This would inform on personal resources and coping interventions required for each category of construction personnel.

LIMITATION OF THE STUDY

The results are heterogeneous with different names for coping construct measures due to the use of different scales or the adaptation of coping construct questions from several authors. The exclusion criteria were relaxed to allow for reviewing more studies into coping strategies adopted by the construction workforce. Despite the number of articles, the study contributes to the body of knowledge by calling on research with quality methodologies.

CONCLUSIONS

This study reviewed stress-coping strategies among construction personnel. It showed that stress influenced health, well-being, and performance. It was deduced that both problem-focused and emotion-focused coping strategies are adopted by construction professionals, while construction frontline workers tend more to adopt emotion-focused coping behaviors. There is a need for training construction

personnel on coping strategies and the adoption of effective coping strategies. The study indicates that researches on coping strategies should link specific strategies to stressors among construction personnel. The link could highlight better points and measures for primary and secondary job stress interventions. This review recommends that further studies should employ mixed methods. The findings from studies that adopt such mixed methods will better inform on appropriate stress-coping interventions for the construction industry. In the case of a purely quantitative study, the use of WCQ or its simplified version might yield a better result in the industry. There is a need for research in occupational psychology to develop reliable and validated coping constructs whose wordings are specific to the construction industry context.

The study recommends extensive studies on coping strategies among construction personnel in other countries to enhance developing interventions necessary for appropriate job stress management and education on healthy and adaptive coping measures. Studies into the effect of coping strategies on physical and mental health and the role of personal resources (e.g., resilience, self-esteem) as a coping resource are needed. Further studies should consider future-oriented stress-coping strategies; the studies can also be done from a generation gap perspective. Intervention studies on the effect of coping strategies at pre and post-intervention stages are required in the construction industry; this will improve the quality of evidence and better inform interventions needed for effective stress management.

REFERENCES

Aghaei Chadegani, A., Salehi, H., Yunus, M., Farhadi, H., Fooladi, M., Farhadi, M. & Ale Ebrahim, N. (2013). A comparison between two main academic literature collections: Web of Science and Scopus databases. Asian social science, 9, 18-26.

Aitken, A., & Crawford, L. (2007). Coping with stress: Dispositional coping strategies of project managers. International Journal of Project Management, 25, 666-673. https://doi.org/10.1016/j.ijproman.2007.02.003.

Biggs, A., Brough, P. & Drummond, S. (2017). Lazarus and Folkman's psychological stress and coping theory. The handbook of stress and health, 349-364.

Bowen, P., Edwards, P., Lingard, H., & Cattell, K. (2014). Workplace stress, stress effects, and coping mechanisms in the construction industry. Journal of Construction Engineering and Management, 140, 04013059. https://doi.org/10.1061/(ASCE)CO.1943-7862.0000807.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative research in psychology, 3, 77-101.

Brenda, Y., & Steve, R. (2006). Coping strategies among construction professionals: Cognitive and behavioural efforts to manage job stressors. Journal for education in the Built Environment, 1, 70-79.

Campbell, F. (2006). Occupational stress in the construction industry. Berkshire, UK: Chartered Institute of Building.

Chan, I., Leung, M. Y., & Liang, Q. (2018). The roles of motivation and coping behaviours in managing stress: Qualitative interview study of Hong Kong expatriate construction professionals in mainland China. International journal of environmental research and public health, 15, 561.

Chan, I. Y. S., Leung, M. Y., & Yu, S. S. W. (2012). Managing the stress of Hong Kong expatriate construction professionals in Mainland China: Focus group study exploring individual coping strategies and organizational support. Journal of Construction Engineering and Management, 138, 1150-1160.

Chan, Y. S. I., Leung, M. Y., & Yuan, T. (2014). Structural relationships between cultural values and coping behaviors of professionals in the stressful construction industry. Engineering, Construction and Architectural Management, 21, 133-151. 10.1108/ECAM-07-2012-0069.

Davidson, M. J., & Sutherland, V. J. (1992). Stress and Construction Site Managers: Issues for Europe 1992. Employee Relations, 14, 25-38. 10.1108/01425459210012680.

Desjarlais, R. (1995). World mental health: Problems and priorities in low-income countries, Oxford University Press, USA.

Enshassi, A., Al-Swaity, E., Abdul Aziz Abdul, R., & Choudhry, R. (2018). Coping behaviors to deal with stress and stressor consequences among construction professionals: A case study at the Gaza Strip, Palestine. Journal of Financial Management of Property and Construction, 23, 40-56. 10.1108/JFMPC-12-2016-0057.

Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., Delongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: cognitive appraisal, coping, and encounter outcomes. Journal of personality and social psychology, 50, 992.

Hannigan, B., Edwards, D. & Burnard, P. (2004). Stress and stress management in clinical psychology: Findings from a systematic review. Journal of Mental Health, 13, 235-245. 10.1080/09638230410001700871.

Harris, J. D., Quatman, C. E., Manring, M., Siston, R. A. & Flanigan, D. C. (2014). How to write a systematic review. The American journal of sports medicine, 42, 2761-2768.

Haynes, N. S. & Love, P. E. (2004). Psychological adjustment and coping among construction project managers. Construction Management and Economics, 22, 129-140.

Jacobs, J. A. & Gerson, K. (2001). Overworked individuals or overworked families? Explaining trends in work, leisure, and family time. Work and occupations, 28, 40-63.

Labrague, L. J., Mcenroe-Petitte, D. M., Gloe, D., Thomas, L., Papathanasiou, I. V. & Tsaras, K. (2017). A literature review on stress and coping strategies in nursing students. Journal of Mental Health, 26, 471-480.

Labrague, L. J., Mcenroe-Petitte, D. M., Leocadio, M. C., Van Bogaert, P. & Cummings, G. G. (2018). Stress and ways of coping among nurse managers: An integrative review. Journal of clinical nursing, 27, 1346-1359.

Langdon, R., & Sawang, S. (2018). Construction Workers 'Well-Being: What Leads to Depression, Anxiety, and Stress? Journal of Construction Engineering and Management, 144, 04017100. 10.1061/(ASCE)CO.1943-7862.0001406.

Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping, Springer publishing company.

Leung, M. Y., Chan, Y. S., & Yuen, K. W. (2010). Impacts of stressors and stress on the injury incidents of construction workers in Hong Kong. Journal of Construction Engineering and Management, 136, 1093-1103.

Leung, M. Y., Liang, Q. & Olomolaiye, P. (2016). Impact of Job Stressors and Stress on the Safety Behavior and Accidents of Construction Workers. Journal of Management in Engineering, 32, 04015019. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000373.

Leung, M. Y., Liu, A. M., & Wong, M. M. K. (2006). Impact of stress-coping behaviour on estimation performance. Construction Management and Economics, 24, 55-67.

Liang, Q., Leung, M. Y., & Cooper, C. (2018). Focus group study to explore critical factors for managing stress of construction workers. Journal of Construction Engineering and Management, 144, 04018023.

Lim, S., Chi, S., Lee, J. D., Lee, H. J., & Choi, H. (2017). Analyzing psychological conditions of field-workers in the construction industry. International journal of occupational and environmental health, 23, 261-281.

Lingard, H., & Francis, V. (2008). An exploration of the adaptive strategies of working families in the Australian construction industry. Engineering, Construction and Architectural Management, 15, 562-579. 10.1108/09699980810916997.

Love, P. E. D., Edwards, D. J., & Irani, Z. (2010). Work Stress, Support, and Mental Health in Construction. Journal of Construction Engineering and Management, 136, 650-658. 10.1061/(ASCE)CO.1943-7862.0000165.

Matthews, R. A., Del Priore, R. E., Acitelli, L. K., & Barnes-Farrell, J. L. (2006). Work-to-relationship conflict: Crossover effects in dual-earner couples. Journal of Occupational Health Psychology, 11, 228.

Milner, A., Witt, K., Burnside, L., Wilson, C. & Lamontagne, A. D. (2015). Contact & connect—an intervention to reduce depression stigma and symptoms in construction workers: protocol for a randomised controlled trial. BMC public health, 15, 1062.

Moen, P. & Yu, Y. (2000). Effective work/life strategies: Working couples, work conditions, gender, and life quality. Social problems, 47, 291-326.

Naoum, S. G., Herrero, C., Egbu, C. & 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, 761-782.

Nwaogu, J. M., Chan, A. P. C., Hon, C. K. H. & Darko, A. (2019). Review of global mental health research in the construction industry: A science mapping approach. Engineering, Construction and Architectural Management, 27, 385-410. https://doi.org/10.1108/ECAM-02-2019-0114.

Ojo, G. K., Adeyeye, G. M., Opawole, A. & Kajimo-Shakantu, K. (2019). Gender differences in workplace stress response strategies of quantity surveyors in Southwestern Nigeria. International Journal of Building Pathology and Adaptation, 37, 718-732. https://doi.org/10.1108/IJBPA-10-2018-0084.

Oladinrin, T., Adeniyi, O., & Udi, M. (2014). Analysis of stress management among professionals in the Nigerian construction industry. International Journal of Multidisciplinary and Current Research, 2, 22-33.

Peterson, C., Stone, D. M., Marsh, S. M., Schumacher, P. K., Tiesman, H. M., Mcintosh, W. L., Lokey, C. N., Trudeau, A.-R. T., Bartholow, B., & Luo, F. (2018). Suicide rates by major occupational group—17 states, 2012 and 2015. Morbidity and Mortality Weekly Report, 67, 1253.

Rees-Evans, D. (2020). Understanding Mental Health in the Built Environment. Bracknell, UK: Chartered Institute of Building.

Sommerville, J., & Langford, V. (1994). Multivariate influences on the people side of projects: stress and conflict. International Journal of Project Management, 12, 234-243.

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, 04017073. https://doi.org/10.1061/(ASCE)CO.1943-7862.0001387.

Tijani, B., Jin, X., & Osei-Kyei, R. (2021). A systematic review of mental stressors in the construction industry. International Journal of Building Pathology and Adaptation, 39, 433-460. 10.1108/IJBPA-02-2020-0011.

Yip, B., Rowlinson, S., & Siu, O. L. (2008). Coping strategies as moderators in the relationship between role overload and burnout. Construction Management and Economics, 26, 871-882.