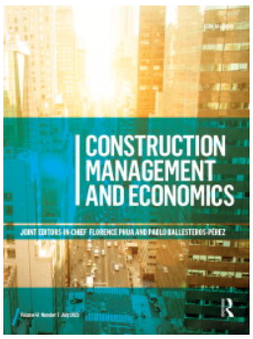

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Coping strategies for work and cultural stressors in multicultural construction workplaces: a study in Australia

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ABSTRACT

Existing coping theories typically position coping as a reactive approach to managing mental health. Intercultural coping was proposed to positively deal with stressors and alleviate the negative impacts of stressors on mental health outcomes in multicultural workplaces. This study aims to investigate the role of intercultural coping strategies in influencing the relationships between stressors and mental health outcomes in multicultural construction workplaces. Data were collected from 252 construction workers in Australia using online questionnaire survey. Data were analysed using the structural equation modelling (SEM) technique. The results revealed the moderating effect of positive coping strategies on the stressor-psychological outcome relationship. A worker who is open to cultural dissimilarity tends to suffer less the adverse effect of cultural stressors on mental health. A worker with cognitive complexity is less susceptible to the adverse impact of work stressors on mental health. Whereas, a worker who is performance-oriented is more vulnerable to the impact of work stressors on mental health. This study may contribute to the existing body of work by uncovering the moderating role of positive coping strategies and providing targeted and effective coping strategies in multicultural construction workplaces.

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KEYWORDS
Construction workers; coping strategies; mental health; multicultural workplace; stressors

Introduction

Mental health issues are prevalent among the construction workforce globally. In Australia, about 20% of the construction workforce have experienced a diagnosable mental health condition in the past 12 months (Mates in Construction 2018). The prevalence of mental health problems has led to severe consequences. A report from the University of Melbourne in 2017 claimed that the construction industry reported a much higher suicide rate than the other sectors, especially for labourers whose suicide rates are distinctly above the male general population (Milner and Law 2017). As reported by Carter and Stanford (2021), the total cost caused by mental health issues on Australia's economy, government, and society was estimated at $200–220 billion annually including $15.8 to $17.4 billion for workplace. Therefore, it is important to devise targeted interventions to improve the mental health performance in the construction industry.

Australia is a multicultural society. Forty-five percent of the current population (10.6 million) was born overseas (Department of Social Services 2017). Over 300 languages are spoken in Australia and nearly 20% of Australians speak another language at home other than English (Australian Bureau of Statistics 2017). This has been reflected in the demographics of workplaces, as around 13% of employees are born in non-English speaking countries and 23% of them are born overseas. In Australia, over half of the working population has contact with people from a different cultural background in their current working life (AimBig 2022). The construction sector is among the most culturally and linguistically diverse industries in Australia (Loosemore *et al.* 2011).

Nevertheless, it is inevitable that the diverse culture at work brings about distinguished cultural differences and complex demands, which may have negative impacts on the individuals involved in an organization, such as cultural conflicts, low morale, tensions,

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confusion and miscommunications (Wu *et al.* 2020). A cultural context can be a major source of mental ill health by imposing demands that are beyond the resources and abilities of individuals or groups (Marsella and Yamada 2000). Therefore, workers' mental health may be exacerbated in a culturally intolerant workplace (Ahmed *et al.* 2022). A few studies have focussed on the mental health issue of construction workers in culturally diverse workplaces: the prevalence of mental illness among migrant construction workers (Al-Maskari *et al.* 2011, Rock *et al.* 2016, Adhikary *et al.* 2018) and sources of mental health problems for migrant workers (Wong and Lin 2014, Adhikary *et al.* 2018, Ahmed *et al.* 2022). However, previous studies mainly focussed on migrant workers, each group of which is homogeneous in terms of national background, without investigating the mental health of a heterogeneous workforce that constantly interacts with different cultures. Therefore, there is a dire need for studies on investigating the influence of a multicultural environment on the mental health of construction workers.

Stressful situations are characterized by different dimensions, such as expected/unexpected, chronic/acute, and positive/negative (Dohrenwend and Dohrenwend 1974). In multicultural workplaces, workers may experience work stressors (e.g. work overload, long working time) and cultural stressors (e.g. cultural conflicts, racial harassment), and the interaction of the working environment stressors may exacerbate their adverse impact on mental health (Liu *et al.* 2022). Mental ill health can be generated if workers fail to cope with the stressors. Coping strategies have been recognized as a psychological intervention, which have a crucial impact on the psychological outcomes of stressors (Yip *et al.* 2008). A few studies have explored the role of coping in mental health management for construction workers (Langdon and Sawang 2018, Liang *et al.* 2018, Nwaogu *et al.* 2022b). These studies explored problem-focussed and emotion-focussed coping behaviours according to Lazarus and Folkman's (1984) coping theory. However, this coping framework positions coping on a reactive approach that is triggered by stressful events (Wong *et al.* 2006). Thus, this framework may be inappropriate in addressing mental health problems in the multicultural environment. Additionally, previous studies revealed that emotion-focussed coping behaviours are related to a higher level of mental ill health (Haynes and Love 2004, Nwaogu *et al.* 2022b). Construction workers tend to adopt more emotional-focussed coping behaviours compared to construction professionals (Liang *et al.* 2018). In contrast, adaptive coping (e.g. problem-focussed coping) strategies are associated with positive psychological outcomes (Nwaogu *et al.* 2022b). Moreover, there are only a few empirical studies on approaches to improving mental health for construction workers (Nwaogu *et al.* 2022a). The approaches mainly focussed on improving mental health awareness via early intervention programs (Gullestrup *et al.* 2011), understanding sources of mental ill health by targeted interventions (Cedstrand *et al.* 2021), and stress management training (Omeje *et al.* 2021). Despite the contributions of previous studies on identifying and mitigating the stressors of mental ill health, little research has been conducted to explore adaptive coping strategies and how they influence the association between stressors and psychological outcomes, particularly in a multicultural construction workforce.

The focus of this study is the adaptive coping strategies for dealing with working environment-related stressors in a multicultural context. Liu *et al.* (2021) proposed the notion of intercultural coping as a positive coping approach to improving the psychological well-being of the individual in a culturally diverse workplace. Intercultural coping is considered as a promising concept to fill the gap of reactive coping approaches in addressing mental ill health. However, it is a conceptual argument, with no empirical support. It remains unclear which coping strategies are effective for which type of stressors. Therefore, this research aims to investigate the role of intercultural coping strategies in influencing the relationship between different types of stressors and psychological outcomes in multicultural construction workplaces. The research was conducted in Australia which is characterized as a multicultural society. This study may contribute to the understanding of the role of positive coping in the stressor-psychological outcome relationship in a multicultural context. The outcome of the research is expected to help construction organizations devise effective interventions to enhance the mental health of construction workers.

Theoretical background and hypotheses

Theoretical framework

There are numerous theoretical models of stress. They can be divided into two main types: models focussing on the stress process, and models focussing on the relationship between stressors and strains (Sonnentag and Frese 2013). Lazarus and Folkman's (1984) transactional theory and Edwards's (1992) cybernetic theory are the most widely adopted models focussing on the

stress process. The transactional theory identifies the antecedents, moderators/mediators and physical/psychological outcomes over the cognitive process. The cybernetic theory suggests that stress develops when there is a discrepancy between a person's perception and the person's desire, and coping can influence the outcome by changing the perceptions, desires and importance of the stressful events (Edwards 1992).

The second grouping of models focussing on the relationship between stressors and strains specifies configurations of stressors that are linked to strains (stress reactions). Derived from the theorizing of Lewin's (1951) person-environment ($P \times E$) interaction, the person-environment fit theory indicates that the misfit between environmental factors and personal characteristics leads to mental illnesses (Edwards *et al.* 1998). The job demand-control model postulates that the interaction between job demands and job control determines mental strain (Karasek 1979). The level of mental strain individuals experience at work is determined by the extent to which they have control over the demands. This model was further extended as job demand-control (-support) model by integrating social support (Johnson and Hall 1988). Based on the job demand-control model, a job demand-job resource model developed by Demerouti *et al.* (2001) indicates that the negative effects of job demand on psychological health can also be mitigated by other resources (e.g. support, feedback, involvement, and reward) in addition to job control.

The stress theories emphasize the critical role of stressors at work on psychological health. Particularly, theories such as the transactional theory, cybernetic theory, and job demand-control (-support) model highlight the role of coping in affecting the relationship between stressors and mental health outcomes. Furthermore, the transactional theory and person-environment fit theory emphasize the interaction between personal and environmental variables. Based on the stress theories, this study attempted to investigate the interaction between coping and working environment stressors in influencing mental health outcomes.

Coping refers to "the person's constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the person's resources" (Lazarus and Folkman 1984, p. 141). An individual consciously or subconsciously appraises, chooses and participates in specific cognitive procedures and actions, which is termed coping strategies (Lazarus and Folkman 1984, Endler and Parker 1989). Coping strategies have been recognized as an important intervention in the stressor-psychological outcome relationship, affecting the tangible and intangible outcomes of the stressor (Yip *et al.* 2008). Individuals employ coping strategies to alleviate negative psychological or physical consequences resulting from stressful events (Song 2009). The effectiveness of coping strategies in alleviating the effects of stressors on psychological consequences particularly hinges on the type of stressors and situational features (McCrae 1984).

Given that coping strategies can affect the relationship between stressors and psychological outcomes, they are considered as moderators of the stressor-psychological outcome relationship (Livneh and Martz 2007). Coping affects the person-environment fit through three pathways: (1) extent of attentional focus, (2) change of meaning of the situation, and (3) change of the conditions of the person-environment relationship (Folkman and Lazarus 1991). The adoption of adaptive coping strategies can affect the person-environment fit and result in positive outcomes for individuals. Therefore, the most significant consideration for choosing effective coping strategies is the "fit" between the specific stressors and the coping strategies (Folkman and Moskowitz 2004).

Stressors in a multicultural construction work environment

Stressors are events that impose excessive and unwanted strains on individuals (Bhagat *et al.* 1985). Both work-related stressors and social-environmental stressors are crucial stressors in multicultural organizations (Zhang and Long 2006). However, most studies in construction only focussed on workplace stressors but ignored the social-environmental stressors. Previous research found that there existed higher levels of social-environmental stressors among multicultural work teams compared to monocultural counterparts (Leifels and Bowen 2021). A further understanding of stressors in a multicultural context is thus required. Through reviewing the literature on construction, work stressors and cultural stressors were identified as the major stressors in a multicultural construction work environment (Liu *et al.* 2022).

Work stressors

Most studies on work stressors have focussed on construction professionals and only a few have investigated construction labours/operatives. However, previous research indicated that both construction professionals and manual workers would experience

job-related stressors such as work overload, tight deadlines, poor communication and inadequate feedback (Campbell 2006, Abbe *et al.* 2011). Sun *et al.* (2022) discovered that construction trade workers are more likely to be affected by high job demands such as role overload, interpersonal conflicts and job insecurity compared to construction professionals. Moreover, Boschman *et al.* (2013) found that the major risk factors for construction tradespersons were poor job control, few learning opportunities and uncertainties about the future. Ng and Chan (2018) uncovered that work demand factors, such as physical work for a long time, excessive amount of work, were associated with increased levels of psychological distress among construction workers. Pirzadeh *et al.* (2022) found that job insecurity and perceived unfair rewards were significant predictors of mental illness in three age groups of manual construction workers (i.e. young, mid-age and old workers). Additionally, the mental health of mid-age and older construction workers was significantly affected by job demand and job intensity. The occupational stress model of Cooper and Marshall (1976) shows a good fit with the work-related stressors in construction. It has been broadly utilized in health-related research areas, which confirmed its validity and reliability. This model identified five categorizations of stressors at work, containing factors intrinsic to a job (e.g. tight deadlines, heavy workload), role in organization (e.g. role ambiguity and role conflicts), career development (e.g. under promotion, job insecurity), relationships at work (e.g. relationships with workmates and supervisors), and organizational structure and climate (e.g. hierarchical links and lack of autonomy).

Cultural stressor

Interacting with people from different cultures in multicultural workplaces may generate a wide range of conflicts related to values, beliefs, customs, and exchanging information, which could become crucial daily stressors (Riedel *et al.* 2011). The acculturative stress theory developed by Berry (1970) implies that continuous first-hand intercultural interactions could produce cultural stressors (Berry *et al.* 1987). Cultural stressors play crucial roles in creating mental ill health (Marsella and Yamada 2000). Currently, a paucity of research has been conducted on the cultural stressors in construction fields. In multicultural construction workplaces, racial discrimination, language barriers, and cultural value conflicts were identified as the main sources of cultural stressors (Liu *et al.* 2022).

Coping strategies in multicultural construction workplaces

When encountering stressful events, an individual consciously or subconsciously attempts to cope with them with strategies to reduce the stressors and their negative outcomes (Lazarus and Folkman 1984). The selection of coping strategies is crucial for determining the psychological outcomes. The adoption of the adaptive coping approach (e.g. rational problem solving) can ameliorate mental health conditions (Folkman 1997), while the maladaptive coping behaviours (e.g. disengagement) can lead to increased levels of mental distress (Langdon and Sawang 2018). Therefore, appropriate coping strategies should be employed with a specific context to achieve the fit between the person and environment (Logan 2019).

Intercultural coping was proposed by Liu *et al.* (2021) to manage stressors and alleviate their adverse impacts on mental health in a culturally diverse context. This concept had its theoretical foundation in positive psychology and intercultural competence (Liu *et al.* 2021). As previously mentioned, traditional mental health interventions typically focussed on reducing the sources of mental health issues and positioning coping on a reactive approach. However, individuals are no longer viewed as passive subjects responding to stressors. Instead, the individual is regarded as a decision maker who is capable of controlling situations and producing effective outcomes (Seligman 2002). Positive psychology intends to shift the focus from restoring the worse facets of life only to developing positive qualities for a good life as well. A positive psychology approach, prioritizing the building of strength for preventing and treating mental illness, has been acknowledged as a possible remedy for the ineffectiveness of traditional mental health interventions (Seligman and Csikszentmihalyi 2014). The general stance of positive psychology towards prevention and treatment claims that positive personal traits act as buffers against psychological disorders. Effective prevention and treatment of mental illness can be achieved through identifying, intensifying, and focussing on the capacities when people are in adverse conditions (Seligman 2002). Therefore, interventions to improve mental health are suggested to focus on developing positive personal competences (Di Fabio 2017).

Intercultural competences are recognized as effective abilities to cope with psychological issues in a multicultural context (Starren *et al.* 2013). Intercultural competence refers to the targeted attitude, skill, and knowledge that result in visible communication and

behaviour that are both appropriate and effective in multicultural situations (Deardorff 2006). It has been identified into three dimensions: affective competence, behavioural competence, and cognitive competence (Lloyd and Hartel 2010; Arasaratnam-Smith 2017). Specifically, affective competence relates to the attitudes of an individual in respect of specific cultures (Gudykunst and Kim 1997). Dissimilarity openness, tolerance for ambiguity and cultural empathy have been classified as affective intercultural competences. Behavioural competence refers to the skills for stressful events in a multicultural environment, which contains intercultural communication competence, emotion management skills and conflict management skills (Dodd 1987). Cognitive competence pertains to the knowledge to perceive and comprehend information (Dodd 1987). Cognitive complexity and goal orientation have been categorized as cognitive competences (Lloyd and Hartel 2010). Therefore, through incorporating intercultural competences into coping repertoire from a positive psychology perspective, the concept of intercultural coping was proposed which aims to respond to stressful events to alleviate the negative psychological outcomes with positive competences in multicultural workplaces. Intercultural coping has three dimensions, namely, affective intercultural coping, behavioural intercultural coping, and cognitive intercultural coping (Liu et al. 2020).

In view of the stress theories discussed previously, coping strategies could exert a moderating effect on the stressor-psychological outcome relationship. Accordingly, intercultural coping strategies are likely to serve as moderators between working environment stressors and psychological outcomes. Given constant levels of stressors, the employment of intercultural coping strategies may affect the relationship between work stressors/cultural stressors and psychological outcomes, changing levels of psychological distress. Therefore, the following hypotheses are proposed:

Hypothesis 1: The effect of work stressors on psychological outcomes varies with different levels of intercultural coping strategies.

Hypothesis 2: The effect of cultural stressors on psychological outcomes varies with different levels of intercultural coping strategies.

Methods

Design

According to Fellows and Liu (2015), a correlational research design can be used when there exists a relationship between multiple facets of a situation. This study aims to explore the relationship between work stressors/cultural stressors, intercultural coping strategies, and psychological outcomes, and thus follows a correlational research design. Ontology deals with the existence of a phenomenon based on philosophical considerations (Creswell and Clark 2017). The phenomenon this study attempts to investigate conforms to the objective view of the social world because the associations between work stressors/cultural stressors, intercultural coping strategies, and psychological outcomes are presumed to be independent from the investigators. From the ontological perspective, the nature of this research is compatible with the objectivism/realism. Therefore, this study selected a quantitative research method and a survey research design.

Data collection

The research aim and hypotheses suggest that there were four main research variables in this study including work stressors, cultural stressors, intercultural coping strategies and psychological outcomes. This study mainly focussed on coping with working environment related stressors. Coping with non-working environment related stressors was not within the scope of this research. Although control variables may influence the understanding of the relationships between independent variables and dependent variables, they were not included in this study because: (1) there were no clear theoretical justification to include specific control variables; (2) the variables identified in the hypotheses were considered sufficient for achieving the research purpose; and (3) inclusion of control variables with unknown, nonzero associations with independent variables may potentially confound statistical control efforts and cast disrupting effects on the interpretability of regression coefficients (Spector and Brannick 2011).

The questionnaire was designed to collect respondents' perceptions and experiences of stressors, intercultural coping strategies and psychological outcomes. Work stressors and cultural stressors are second-order constructs which were measured through their sub-dimensions. A five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) was used to measure each dimension. The sub-dimensions of work stressors were measured with three items based on Leung et al. (2017), Leung et al. (2005) and Cooper et al. (1988). The sub-factors of cultural stressors were

measured with three items adapted from Wong and Lin (2014), Leung et al. (2017), and Gil et al. (1994).

Eight intercultural coping strategies from three dimensions were measured. Each type of strategy was measured with three items on a four-point Likert scale ranging from 1 (not at all true) to 4 (completely true). Affective intercultural coping refers to an individual's positive attitudes to managing stressful events in a multicultural context, including dissimilarity openness, tolerance for ambiguity and cultural empathy. Behavioural intercultural coping (i.e. intercultural communication competence, emotion management skills and conflict management skills) refers to the positive skills for stressful events. Cognitive complexity and goal orientation are cognitive intercultural coping strategies, which refer to an individual's knowledge to perceive and understand information for stressful events. The measurement items of intercultural coping strategies were adapted from previous studies (Hammer *et al.* 1978, Dodd 1987, McLain 1993, Wang and Chan 1995, Tjosvold et al. 2003, Wang *et al.* 2003, Hartel et al. 2005, Jordan and Lawrence 2009).

The Kessler Psychological Distress Scale (K6) was used to measure psychological outcomes. This scale involves six questions about psychological distress drawing from anxiety, depression, and stress symptoms with a five-level response scale ranging from 0 (none of the time) to 4 (all of the time). Scores of the six questions were summed, yielding an overall score ranging from 0 to 24. A K6 score which is 13 or above is considered as severe mental ill health, and a score of more than 5 is considered moderate mental ill health (Prochaska *et al.* 2012). The details of the questionnaire items are presented in Appendix A.

The content validity and reliability of the questionnaire were enhanced by a pilot study, which involved seven participants from Australia, including two researchers who are active in mental health research in the construction industry, two construction work health and safety professionals, two experienced construction workers and a mental health specialist. The participants were required to identify any issues with the wording and accuracy that may impede their understanding of the questionnaire, and determine if the questions are appropriate for construction workers in the Australian construction context. Feedback from the pilot study involved confirming the use of the K6 scale, cutting down the length of the questionnaire, modifying the equivocal wording, and deleting repeated questions.

The unit of analysis of this study is individual construction workers. The questionnaire was distributed to potential respondents via Incolink, which is Australia's oldest, largest and most comprehensive workers' entitlement scheme and has been recognized as the safety net for workers' physical and mental health in the building and construction sector. In this research, the sampling frame is the 35 000 active worker members in Incolink. The link to Qualtrics survey was sent to all the members of Incolink. Respondents should meet the criteria: no less than 18 years old, working on construction sites, at least one year of working experience, and working with people from different cultures in a crew or on a project. A total of 398 responses were received, among which 252 questionnaires were valid. The invalid responses—which were incomplete, had less than 5 minutes response durations or gave the same answer on the questionnaire, were excluded from data analysis.

The reliability and validity of the questionnaire was assessed by Cronbach's alpha, and KMO (Kaiser–Meyer–Olkin) and Bartlett's tests using IBM SPSS Statistics 27. The results show that the questionnaire has strong reliability and validity (Cronbach's alpha $=$ 0.861, KMO $=$ 0.854 and significance level of Bartlett's test is 0.000) (Napitupulu *et al.* 2017, Zhao *et al.* 2018).

Method of data analysis

The structural equation modelling (SEM) technique with partial least squares (PLS) was adopted to test the research model. PLS-SEM is a second-generation multivariate analysis technique, which enables researchers to concurrently examine a number of interdependent associations among clusters of constructs indicated by manifold factors (Ali *et al.* 2018). This method was considered appropriate for this study because PLS can easily handle nonnormally distributed data, small sample size, flexible measurement models, complex structural models, and latent variable scores; and is precise in predicting key target constructs and identifying key driving factors (Hair *et al.* 2017). Particularly, it can handle second-order constructs and formative constructs (Chang and Chen 2021). In this study, work stressors, cultural stressors, and three intercultural coping dimensions were characterized as second-order formative constructs, which were measured through the latent variables scores of their corresponding sub-dimensions (first-order constructs).

A PLS-SEM is generally analysed by assessing the measurement model at the first stage, following evaluating the structural model at the second stage. Measurement model is an element of a path model including the measurement items and their

relationships with the construct. The measurement model is assessed by validating the discriminant, convergent validity, and internal consistency reliability of the constructs. The structural model represents the conceptual element of the path model which validates the hypothesized relationships in the research model (Hair *et al*. 2017, Chang and Chen 2021).

The SmartPLS 4 software was used to evaluate the measurement and structural models. In this study, the second-order constructs are formatively measured by their first-order constructs. The disjoint two-stage approach was used to assess the measurement model with second-order constructs based on the research objectives and characteristics of PLS-SEM modelling (Becker *et al*. 2012). The assessment of the measurement models of second-order constructs includes (1) evaluating the measurement models of the first-order construct, and (2) evaluating the measurement model of the second-order construct which is represented by the relationship between the second-order construct and its first-order components (Sarstedt *et al*. 2019). The hypothesized relationships are examined in the structural model following validating the measurement model.

Results

Sample characteristics

Almost all the participants were males (98%), which is consistent with the male-dominated nature of the construction sector. As to education attainment, 39% of the participants received tertiary education, and 61% obtained education from primary school and secondary school. Forty-nine percent of the respondents had at least 21 years of working experience and 34% reported 11–20 years, which indicated that most of the participants are experienced onsite construction workers. In addition, 19% of participants were non-Australians originating from over 20 different countries with half speaking a language other than English as their first language.

Measurement model assessment

The validity and reliability of work stressors and cultural stressors have been confirmed by Liu *et al*. (2022). In this study, the validity and reliability of measurement models for the first-order constructs of intercultural coping dimensions were assessed in stage one. Convergent validity is the extent to which a measure correlates positively with alternative measures of the same construct. It was evaluated by the indicator loadings and average variance extracted (AVE). Indicators with loadings less than 0.40 and AVEs less than 0.50 should be removed from the construct (Hair *et al*. 2017). The internal consistency reliability of constructs was evaluated using Cronbach's alpha (representing the lower bound) and composite reliability (representing the upper bound) (Hair *et al*. 2017). Both criteria should exceed the cut-off values of 0.6 (Hair *et al*. 2017). Discriminant validity is the extent to which a factor is accurately distinct from other factors by empirical criteria. It was evaluated using a new approach the heterotrait-monotrait ratio (HTMT) which was proposed by Henseler *et al*. (2015) as a remedy for traditional approaches. The heterotrait-monotrait ratio (HTMT) is the between-trait correlations to the within trait correlations. It is an estimate of the true correlation between two constructs and can be used as the basis of the assessment of discriminant validity. An HTMT value for all combinations of constructs should be lower than 0.9 (Henseler *et al*. 2015). Table 1 shows that all indicators' loadings, AVEs, Cronbach's alpha, and composite reliability exceed the thresholds, indicating the convergent validity and internal consistency reliability of the constructs were acceptable. The construct emotion management skills was removed due to its insufficient discriminant validity. As shown in Table 2, the discriminant validity of the retained constructs is acceptable and the constructs are conceptually and empirically distinct.

In stage two, the latent variables scores of the first-order constructs were used as the measurement items for the second-order constructs and subsequent estimations of the path models (Becker *et al*. 2012). Thus, the relationships between the second-order constructs and first-order constructs are expressed as the measurement models of the second-order constructs. The assessments for the formative measurement models include evaluating the collinearity issues and the significance and relevance of the indicators (Hair *et al*. 2017, Sarstedt *et al*. 2019). The variance inflation factors (VIF) values are used to determine if there are collinearity issues between the formative constructs and indicators. Table 3 displays that the VIF values of all indicators (first-order components) are less than the cut-off value of 5 (Hair *et al*. 2017). Additionally, there exist significant relationships between the second-order constructs and first-order dimensions of intercultural coping ($p < .05$). Thus, the validity and reliability of the second-order constructs for intercultural coping were confirmed.

Moreover, for psychological distress, scores from 6 items were summed. The result of t-test shows that respondents experienced moderate mental distress on

Table 1. Convergent validity and internal consistency reliability of first-order constructs.

Second-order constructs	First-order constructs	Indicators	Loadings	AVE	Composite reliability	Cronbach's alpha
Affective intercultural coping	Dissimilarity openness	DO1	0.935	0.632	0.833	0.735
		DO2	0.819			
		DO3	0.592			
	Tolerance for ambiguity	TRA1	0.687	0.626	0.830	0.737
		TRA2	0.953			
		TRA3	0.705			
	Cultural empathy	CE1	0.751	0.661	0.853	0.752
		CE2	0.918			
		CE3	0.759			
Behavioural intercultural coping	Intercultural communication competence	ICC1	0.841	0.760	0.905	0.842
		ICC2	0.903			
		ICC3	0.870			
	Conflict management skills	CMS1	0.883	0.728	0.889	0.826
		CMS2	0.782			
		CMS3	0.890			
Cognitive intercultural coping	Cognitive complexity	CC1	0.879	0.662	0.851	0.762
		CC2	0.916			
		CC3	0.613			
	Goal orientation	GO1	0.965	0.669	0.853	0.831
		GO2	0.879			
		GO3	0.553			

Table 2. Discriminant validity (HTMT criterion) of first-order constructs.

Constructs	CC	CE	CMS	DO	GO	ICC
CC						
CE	0.706					
CMS	0.883	0.554				
DO	0.540	0.684	0.488			
GO	0.673	0.425	0.687	0.363		
ICC	0.830	0.561	0.824	0.489	0.516	
TRA	0.614	0.590	0.474	0.788	0.366	0.539

average (mean = 7.89 within the range of 0–24; $p < .001$). The analyses above confirmed the reliability and validity of the measurement model.

Structural model assessment

After validating the measurement models, the moderating effects of intercultural coping strategies on the relationships between stressors and psychological outcomes were tested in stage two. Work stressors and cultural stressors served as independent variables in SEM models of moderating effect, and intercultural coping strategies served as moderator variables that exert influence on the relationships. Bootstrapping with 5000 subsamples was used to assess the significance between variables. The results of the moderating effects are shown in Table 4. In multicultural construction workplaces, (1) the effect of cultural stressors on psychological distress varies with different levels of dissimilarity openness ($\beta = -0.133$, $p < .05$), and (2) the effect of work stressors on psychological distress varies with different levels of cognitive complexity ($\beta = -0.119$, $p < .05$) and goal orientation ($\beta = 0.156$, $p < .05$). Moreover, the moderator's effect size f^2 should be considered in tests of moderation. The f^2 indicates how much the moderation contributes to the explanation of the dependent variable (Hair *et al.* 2017). Based on Kenny's (2016) guidelines, the f^2 values of all the three coping strategies indicate medium moderating effects: dissimilarity openness ($f^2 = 0.021$), cognitive complexity ($f^2 = 0.015$) and goal orientation ($f^2 = 0.020$). However, moderating effects of other intercultural coping strategies were not significant.

As shown in Figure 1, the relationship between cultural stressors (shown in x-axis) and psychological distress (shown in y-axis) varies at three different levels of dissimilarity openness. The positive slope of the lines suggests a positive association between cultural stressors and psychological distress. The second line indicates the relationship for an average level of dissimilarity openness; while the remaining two lines indicate the relationship for lower and higher levels of dissimilarity openness. The simple slope plot shows that a higher level of dissimilarity openness (+1 standard deviation) entails a weaker effect of cultural stressors on psychological distress.

Figure 2 shows how the effect of work stressors on psychological distress changes according to different levels of cognitive complexity. Higher levels of cognitive complexity result in a weaker effect of work stressors on psychological distress.

Figure 3 demonstrates that work stressors have different effects on psychological distress in different levels of goal orientation. Higher levels of goal orientation entail a stronger impact of work stressors on psychological distress.

Table 3. Relationships between second-order constructs and first-order components.

Second-order constructs	First-order constructs	Loadings	T statistics	*p* Values	VIF
Affective intercultural coping	Dissimilarity openness	0.776	5.788	.000	1.550
	Tolerance for ambiguity	0.813	6.317	.000	1.513
	Cultural empathy	0.810	4.901	.000	1.303
Behavioural intercultural coping	Intercultural communication competence	0.947	11.824	.000	1.836
	Conflict management skills	0.876	4.568	.000	1.836
Cognitive intercultural coping	Cognitive complexity	0.977	12.958	.000	1.297
	Goal orientation	0.655	4.656	.000	1.297

Table 4. Results of moderating effects.

Moderating effect	Coefficient	T statistics	*p* Values	f^2	Interpretation
Cultural empathy*Cultural stressors –> Psychological distress	−0.021	0.305	.761	0.000	Not supported
Dissimilarity openness*Cultural stressors –> Psychological distress	−0.133	1.996	.046*	0.021	Supported
Tolerance for ambiguity*Cultural stressors –> Psychological distress	0.123	1.545	.122	0.014	Not supported
Conflict management skills*Cultural stressors –> Psychological distress	0.005	0.058	.954	0.000	Not supported
Intercultural communication competence*Cultural stressors –> Psychological distress	0.038	0.436	.663	0.001	Not supported
Cognitive complexity*Cultural stressors –> Psychological distress	−0.075	1.010	.312	0.007	Not supported
Goal orientation*Cultural stressors –> Psychological distress	0.112	1.471	.141	0.011	Not supported
Cultural empathy*Work stressors –> Psychological distress	0.064	1.061	.289	0.005	Not supported
Dissimilarity openness*Work stressors –> Psychological distress	−0.057	0.814	.416	0.003	Not supported
Tolerance for ambiguity*Work stressors –> Psychological distress	0.015	0.197	.844	0.000	Not supported
Conflict management skills*Work stressors –> Psychological distress	−0.030	0.356	.722	0.001	Not supported
Intercultural communication competence*Work stressors –> Psychological distress	0.066	0.770	.441	0.003	Not supported
Cognitive complexity*Work stressors –> Psychological distress	−0.119	1.978	.048*	0.015	Supported
Goal orientation*Work stressors –> Psychological distress	0.156	2.141	.032*	0.020	Supported

*$p < .05$ (two-tailed).

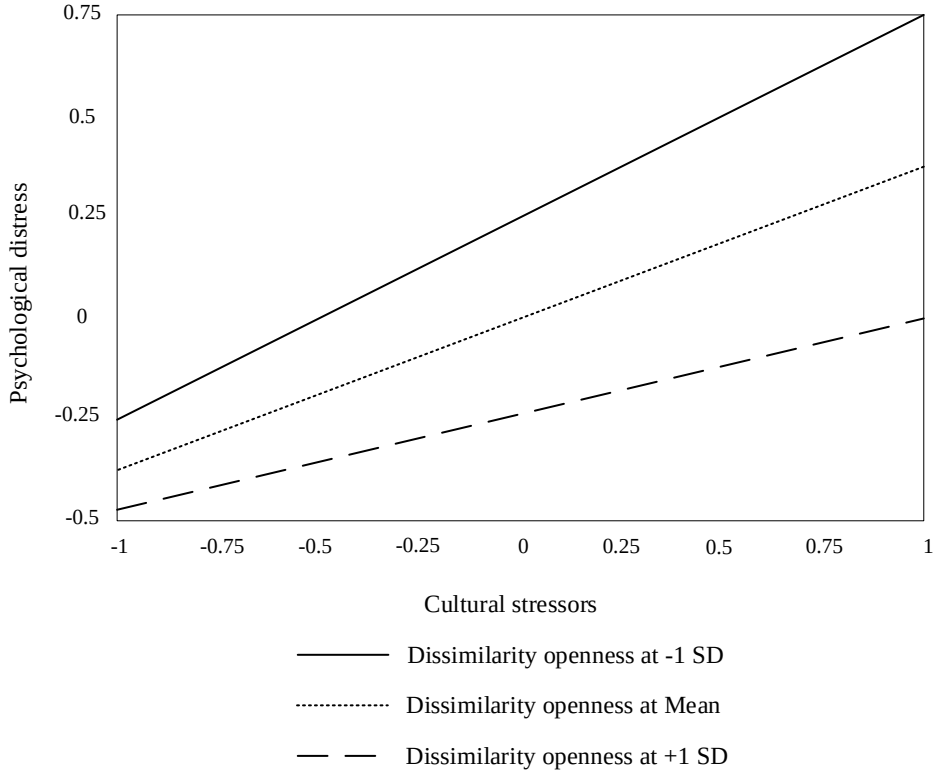

Figure 1. Simple slope for psychological distress on centred cultural stressors at three typical values of dissimilarity openness.

Discussions

The results demonstrated that three intercultural coping strategies significantly moderated the relationships between specific types of stressors and mental health outcomes (Figure 4). The relationships are not constant according to different levels of intercultural coping strategies. The finding corroborates the transactional theory of stress and coping suggesting that

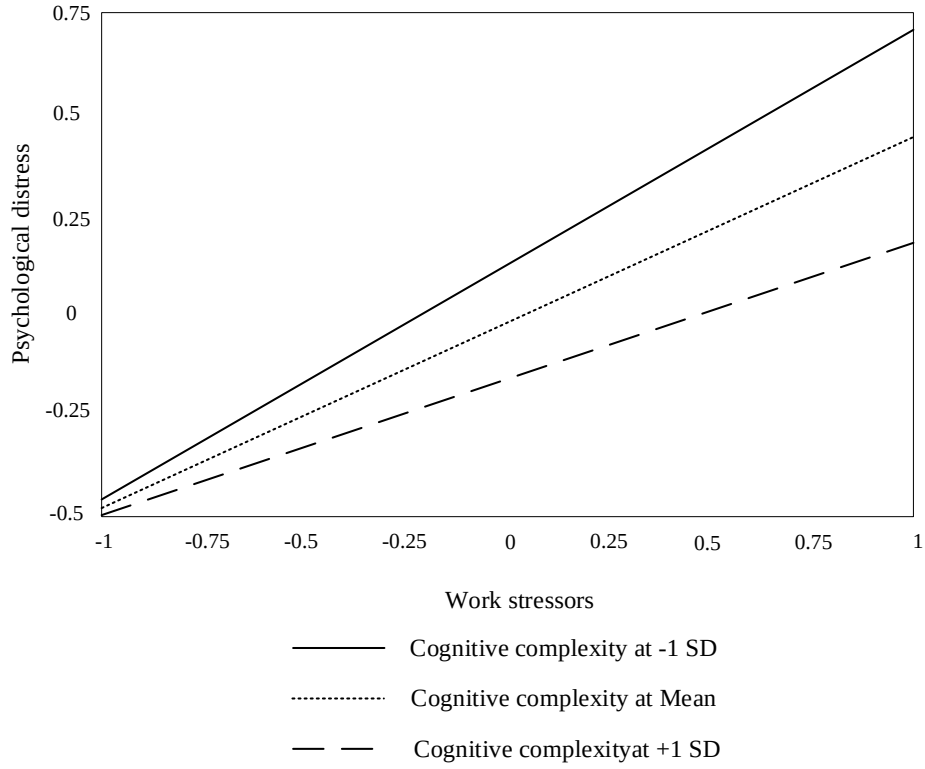

Figure 2. Simple slope for psychological distress on centred work stressors at three typical values of cognitive complexity.

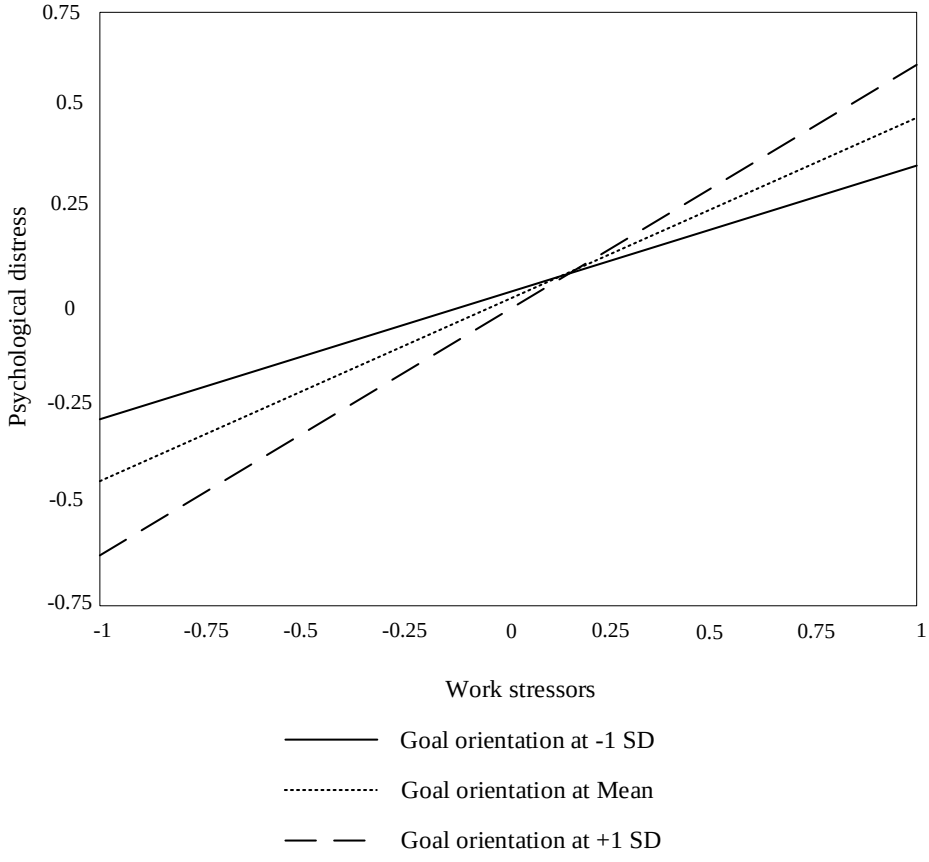

Figure 3. Simple slope for psychological distress on centred work stressors at three typical values of goal orientation.

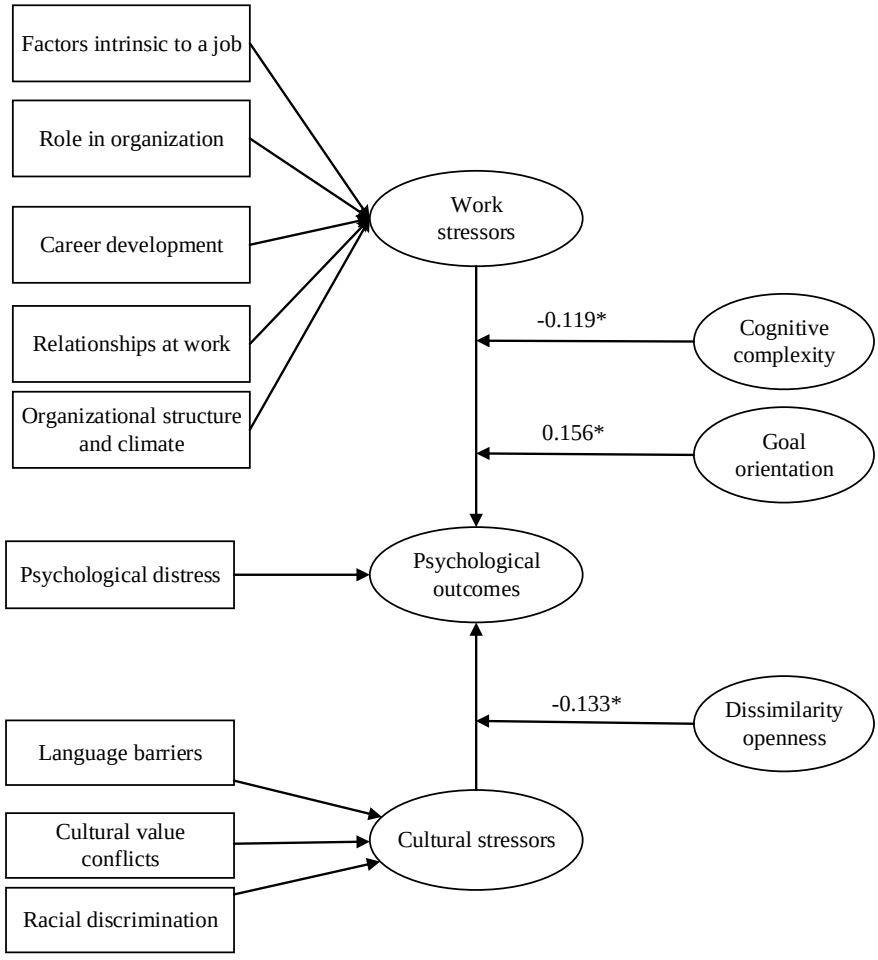

Figure 4. Moderating effects of intercultural coping strategies on the relationship between stressors and psychological outcomes (*$p < .05$).

the effectiveness of a specific type of coping strategy in alleviating the adverse effects of stressors is dependent on the types of stressors (Folkman and Lazarus 1980). Particularly, dissimilarity openness significantly alleviated the effects of cultural stressors on psychological distress. This result implies that when construction workers employ more dissimilarity openness strategies which attempt to understand, acknowledge, and appreciate different cultures, the adverse impact of cultural stressors on mental health is significantly weaker than when they use less of it. Cognitive complexity mitigated the effects of work stressors on psychological distress. It suggests that workers using more cognitive complexity strategies which perceive and evaluate stressful situations with comprehensive and detailed information would have lower levels of psychological distress resulting from work stressors. However, although goal orientation was found to be a significant moderator, higher levels of goal orientation exacerbated the effects of work stressors on psychological distress.

Moderating effects of intercultural coping strategies on the relationship between cultural stressors and psychological distress

The result showed that dissimilarity openness significantly buffered the effects of cultural stressors on mental health. This finding indicates that dissimilarity openness is an effective coping strategy targeted at cultural stressors in a culturally diverse construction work environment. Previous studies have emphasized the vital moderating role of dissimilarity openness in intercultural interactions and positive outcomes (Ayoko and Härtel 2000, Härtel and Fujimoto 2000). In culturally diverse workplaces, dissimilarity is prevalent among workers. Failure to manage dissimilarity could lead to cultural stressors (Foster *et al.* 1991). Dissimilarity openness centres on the understanding, acknowledgment, and appreciation of different cultures (Wang *et al.* 2003). Individuals with a high level of dissimilarity openness tend to deal with cultural differences positively and be willing to interact with dissimilar members, which helps to develop a healthy

organizational climate and diminish destructive conflicts (Fujimoto *et al.* 2000). Moreover, the process model of intercultural competence suggests that positive attitudes (e.g. openness, respect) function as the basis of the model and affect all other processes of intercultural competence (Deardorff 2011). Thus, positive attitudes are the basis for the positive knowledge and skills to deal with stressful events. Therefore, dissimilarity openness, a positive affective coping approach, should be incorporated into interventions designed to buffer psychological distress arising from cultural stressors.

Moderating effects of intercultural coping strategies on the relationship between work stressors and psychological distress

The result showed that cognitive complexity interacted with work stressors and exerted a significant moderating effect on mental health. This result confirmed the effectiveness of cognitive complexity in managing work stressors. Indeed, individuals with cognitive complexity are more likely to have comprehensive and differentiated understandings of relevant situations, and develop effective strategies to deal with difficulties and challenges (Pancer *et al.* 2000, Karim 2003). Cognitive complexity is the dimension of cognitive coping that aims to alter the cause of stress and affect the cognitive reappraisal of the stressor. Because stress is dependent on the cognitive appraisal of the stressor and potential resources, the stressor appraisal tends to be more important than practical actions to alter the stressor (Lazarus and Folkman 1984, Song 2009). The construction workplace is characterized by a variety of ingrained work stressors (e.g. overwhelming workload, role conflicts, and poor relationships). Workers employing cognitive complexity strategies can help themselves perceive and appraise those complex stressful situations from various angles, and to think of the stressful situations as opportunities instead of difficulties, thereby preventing or minimizing negative psychological consequences. Therefore, cognitive complexity should be incorporated into intervention strategies designed to buffer psychological distress resulting from work stressors.

The result showed that goal orientation significantly moderated the relationship between work stressors and psychological distress. However, the adverse effect of work stressors on psychological outcomes became more significant when more goal orientation strategies were employed. The reason might be that goal orientation can be manifest as learning orientation or performance orientation. Individuals who are performance-oriented attempt to maintain positive judgements of their skills, make good impressions and outperform colleagues, which can result in a competitive work environment (Vrugt *et al.* 2002). Under these circumstances, work stressors might be exacerbated, leading to higher levels of psychological distress. Although adaptive coping strategies are generally related to improved psychological well-being, they may fail to reduce psychological distress generated from specific stressors. Langdon and Sawang (2018) also demonstrated that adaptive coping strategies (e.g. acceptance, humour) were related to increased psychological distress in the construction workforce. Consequently, the employment of adaptive coping strategies should be adjusted when facing different stressors. In a stressful working environment, construction companies should change the organizational culture from a performance-oriented culture to a people-oriented culture to develop a supportive work environment instead of a competitive work environment. Recreational activities designed to promote good relationships between workers and release work pressure may assist in this.

Conclusion

This study revealed the impact of positive coping strategies on the stressor-psychological outcome relationship for construction workers in a multicultural context. Under different levels of intercultural coping strategies (dissimilarity openness, cognitive complexity and goal orientation), cultural stressors and work stressors exert different effects on psychological outcomes. Particularly, a worker who is open to cultural dissimilarity tends to suffer less the adverse effect of cultural stressors on mental health. A worker with cognitive complexity is less susceptible to the detrimental impact of work stressors on mental health. Whereas, a worker who is performance-oriented is more vulnerable to the adverse impact of work stressors on mental health. The results demonstrated the effectiveness of different coping strategies in managing different types of stressors for construction workers in multicultural workplaces.

This study extends the existing body of work by uncovering the moderating effect of positive coping strategies on the stressor-psychological outcome relationship. Existing coping theories and coping frameworks mainly feature generic strategies and

position coping on a reactive approach (Wong *et al.* 2006). This study advances the coping theories by focussing on proactive coping strategies tailored for the multicultural construction workforce. Previous research (e.g. Boschman *et al.* 2013, Pirzadeh *et al.* 2022) has sought to identify the contributing factors of mental ill health to diminish potential stressors. The moderating effect of intercultural coping strategies revealed in this study demonstrates that mental health can be improved from the angle of coping given constant stressor levels, thereby contributing to the understanding of stressor-psychological outcome process from the perspective of positive psychology. This study also advances mental health research for construction workers by identifying effective coping strategies for specific types of stressors in multicultural workplaces. The finding provides helpful references in designing effective interventions tailored for construction workers.

This study can also contribute to the practice of work health and safety in the construction sector. The intercultural coping strategies recognized in this research can help practitioners to develop effective intervention programs targeted at specific stressors. Training in coping strategies can be developed to equip construction workers with effective coping resources. For example, to mitigate mental health problems in a culturally intolerant organization, the most effective intervention is to promote understanding of cultural differences and positive interactions between workers. To reduce mental health problems arising from stressful working conditions, appropriate training focussed on developing comprehensive perceptions and positive appraisals of challenging events can be developed. Additionally, shifting from a performance-oriented culture to a people-oriented culture may help buffer workers from mental ill health resulting from work stressors.

The limitations and directions for future research should be discussed. First, the self-report survey was adopted, which may create potential response bias. Future research may consider using mixed methods (e.g. observation, in-depth interview, and focussed group) for a better understanding of the relationships between constructs. Second, the findings were drawn from the data gathered from construction workers in Australia and thus may not be generalized to other countries. However, this study provided a reference for similar studies in other countries. Comparative studies between different counties featuring a multicultural work environment can be conducted in future research. Third, it is acknowledged that workers who have experience on both multicultural sites and non-multicultural sites can provide more experience-based information. Thus, future research is recommended to obtain data from workers with both multicultural and non-multicultural working experience to enrich the findings. Last, it is acknowledged that a general limitation of a correlational study is that it can determine correlation between variables but cannot predict causation. Non-working environment related stressors and other factors might play a role in the relationship. To ensure the validity of the findings, we comprehensively discussed the statistical results and correlation coefficients in the context of theory and literature through explanations, comparisons and reinforcement and meticulously interpreted the inference of causations. The conclusions are valid for the sample and context. Future studies may be conducted to explore coping with non-working environment related stressors for construction workers.

Ethical approval

The study was conducted in accordance with the National Statement on Ethical Conduct in Human Research 2007 (Updated 2018). Ethical approval for this study has been granted by the Western Sydney University Human Research Ethics Committee (HREC Approval Number: H14008).

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Appendix A

Table A1. Questionnaire items

Work stressors
Factors intrinsic to a job
FIJ1: Work is constantly under pressure
FIJ2: Simultaneously work on multiple tasks
FIJ3: Many tasks are urgent and have strict deadlines
Role in organization
RIO1: Have difficulty deciding between high quality and high productivity
RIO2: Things I do are often accepted by one person and not another
RIO3: My supervisor and staff often place conflicting demands on me
Career development
CD1: Work at a level lower than my ability
CD2: Risk of redundancy
CD3: Lack of career development
Relationships at work
RAW1: Feel not being respected enough by my colleagues
RAW2: Not trust those whom I am working with
RAW3: Dislike those whom I am working with
Organizational structure and climate
OSC1: Small things have to be referred to someone higher up for the final decision
OSC2: Subordinates have to ask their superiors for almost anything
OSC3: Any decision has to have my boss's approval
Cultural stressors
Racial discrimination
RD1: Have encountered name-calling or racist jokes
RD2: Feel isolated and ignored in the workplace
RD3: Have experienced frequent offensive and rude gestures
Language barriers
LB1: Communication in a common language is not easy for me
LB2: It is difficult for me to read and understand the common language
LB3: Nervous in obtaining information in a common language
Cultural value conflicts
CVC1: Have problems with my team members because of different cultural customs
CVC2: Get upset at my team members because they don't know my cultural customs
CVC3: Feel uncomfortable having to choose between my own and other ways of doing things due to different cultural backgrounds
Affective intercultural coping
Dissimilarity openness
DO1: Be patient with team members from other cultural backgrounds
DO2: Understand why colleagues keep their cultural traditions
DO3: Be respectful when colleagues of different cultural backgrounds speak their language
Tolerance for ambiguity
TRA1: Enjoy ambiguous situations
TRA2: Positively tackle ambiguous problems
TRA3: Solve complex problems from different perspectives
Cultural empathy
CE1: Show appreciation of cultural norms
CE2: Express my concern about discrimination
CE3: Tell people making racist jokes is offensive
Behavioural intercultural coping
Intercultural communication competence
ICC1: Enter into meaningful dialogue with workmates
ICC2: Develop and maintain satisfying interpersonal relationships
ICC3: Solve communication misunderstandings
Emotion management skills
EMS1: Talk to other people about the emotions I experience
EMS2: If I feel down, I will do things that can make me feel better
EMS3: Give a fair hearing to people's ideas
Conflict management skills
CMS1: Seek a solution good for our team
CMS2: Treat conflict as a mutual problem
CMS3: Combine the best of positions
Cognitive intercultural coping
Cognitive complexity
CC1: Evaluate a situation from various aspects
CC2: Acquire detailed information about a situation
CC3: Think deeply about related challenge
Goal orientation
GO1: Enjoy learning something
GO2: Learn a new skill for work
GO3: Achieve a higher standard at work
Psychological distress
How often have you felt nervous over the past 30 days?
How often have you felt hopeless over the past 30 days?
How often have you felt restless or fidgety over the past 30 days?
How often have you felt so depressed that nothing could lift your spirits over the past 30 days?
How often have you felt that everything was difficult over the past 30 days?
How often have you felt worthless over the past 30 days?