

## **Mindfulness-based Stress Reduction Workshop: Reducing Stress and Improving Coping Behaviours of Construction Professionals**

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### **Abstract**

Construction professionals (CPs) often encounter stress during the work in the construction industry, which consequently induces different negative consequences at both individual and organization levels. Mindfulness-based stress reduction (MBSR) has been widely adopted for patients and various professionals. In order to investigate the impact of MBSR on the CPs in the industry, an intervention study consisting of 8-week workshop was conducted. A questionnaire survey was administered to two groups (a MBSR participant group, and a control group) before and after the MBSR workshops. The findings revealed that seven out of eight mindfulness characteristics items and two out of three coping behaviours items received significantly higher scores, while three out of five physical stress items got significantly lower scores among the MBSR participants in comparing with the non-MBSR participants. The results of the Pearson correlation also shown that mindfulness characteristics had direct influences on the CPs by reducing their physical stress and improving their coping behaviours. The study demonstrated the pivotal importance of MBSR training on CPs for reducing their stress by improving their mindfulness characteristics and coping behaviors. It is, thus, strongly recommended to introduce the MBSR program in the construction industry.

**Keywords:** Construction professional; Coping behaviors; Mindfulness characteristics; Stress.

### **Introduction**

The construction industry is typically considered as challenging, threatening, and stressful (Wu et al., 2018). The complicated nature of construction projects including tight schedules, multi-deadlines, limited budgets, and poor workplace have been witnessed to exacerbate the stress level of construction professionals (CPs) (CIOB, 2006; Leung et al., 2014). Physical activities and demanding tasks are common in the construction industry (Abdelhamid and Everett, 2002). The difficulties faced by CPs are relatively much higher than other professionals in other jobs (Pinto et al., 2016). They need to contribute a large amount of physical effort in various construction tasks, for instance, surveying, executing, and operating the construction activities at different sites (Leung et al., 2014). Therefore, it is common for them to experience physical health issues, such as headaches, high blood pressures, high heart rate, and so on (Leung et al., 2008; Mellner et al., 2005). Indeed, these physical stress

symptoms may be further harmful at both individual and organizational levels (Cooper and Dewe, 2008; Gatti et al., 2014).

In fact, a recent document indicated that 12.8 million days were lost in 2019 due to work-related stress, depression, or anxiety (Health and Safety Executive, 2019). In order to manage this stress, coping strategies are necessary for CPs to improve their physical and mental health (Erdem et al., 2017). In current decades, coping with stress via mindfulness practices has been well accepted by both clinical psychologists and medical doctors (Baer et al., 2004). Many previous studies have reported the effectiveness of mindfulness-based stress reduction (MBSR) workshops in the improvements of health, resiliency, performance, reduction of stress, and so on (Carmody and Baer, 2009; Levy et al., 2012). However, these beneficial impacts of the MBSR workshop on coping behaviors and physical stress among CPs in the construction industry have yet to be identified. Therefore, an innovative stress management strategy is needed urgently. Hence, the present study aims to reduce physical stress and improve coping behaviors of CPs through a MBSR workshop.

### **Mindfulness-Based Stress Reduction (MBSR)**

Mindfulness is defined as an intentional effort to pay attention *non-judgmentally* on the *present moment* (Kabat-Zinn, 1994). It is featured by a focused and non-judgmental monitoring of present perceptions, emotions, and feelings without wandering in the past and future thoughts (Garland, 2007). Mindfulness could be measured in a broad concept with many characteristics, including *observation, curiosity, description, attention, beginner's mind, non-judgment, letting go, and decentering* (Kabat-Zinn, 1994; Leung et al., 2016). MBSR programs have been recognized as the most successful interventions for reducing participants' pain, stress, depression, and other physical health issues (Li and Bressington, 2019). Additionally, it has shown effectiveness in several psychological and physical health symptoms of professionals and the general public (Dobie et al., 2016; Simpson et al., 2019). Although many studies have reported that the practice of mindfulness leads to a substantial reduction of stress and improvement of wellbeing (Chiesa and Serretti, 2009; Garland et al., 2011; Jalali et al., 2019), it is little known for the CPs in the construction industry. Traditionally, MBSR workshops take the standard eight-week training program (2.5 hours/week), in which participants learn various mindfulness skills through both formal and informal mindfulness practices (Kabat-Zinn, 1994). The weekly class includes both mental and physical exercises, such as body scan, sitting meditation, hatha yoga, and mindfulness in daily activities (Hyland et al., 2015; Leung et al., 2016), which help the participants to tranquil their mind intentionally, and eventually to achieve inner peace (Ospina et al., 2007).

### **Physical Stress**

Normally, stress refers to physical and emotional responses that appear when the demand on an individual exceeds with the available resources to cope with it (Leung et al., 2006; Liang et al. 2018). *Physical stress* arises due to physiological reactions that persist against stressful situations and result in high blood pressure, heartbeat rate, headaches, laziness, and so on (Azher et al., 2014; Leung et al., 2012). It is common for the CPs to work in a poor environment, for instance, annoying noise, dirty sites, extreme temperatures, inappropriate lighting, and so on, which can affect their physical health (Leung et al., 2009). Physical stress is still dominant in the construction industry and causes problems

on the health and performance of the CPs. Several researches show that physical stress, such as high blood pressure, high heart rate, yawning, headache, and become drowsy have been reduced through MBSR (Li et al., 2019; O'Doherty et al., 2015).

### Coping Behaviours

According to prominent transactional stress and coping model, appropriate coping can reduce the stress level of an individual (Chan et al., 2012; Lazarus and Folkman, 1984). This theory claims two main features of coping behaviours: problem-based coping and emotion-based coping (Hewstone et al., 2007). In the overall coping process, appraisal plays a key role. Primary appraisal followed by secondary appraisal decides the available resources, and efforts needed to cope with the events (Liang et al., 2018; Park, 2005). The initial evaluation of threatening event is primary appraisal (Ben-Zur, 2019), whereas secondary appraisal will assess available coping resources to control the stressful situations (Leung et al., 2014). The coping process comes into action when it seems suitable to deal with the circumstances (Chan et al., 2018). Therefore, coping behaviours refers to cognitive and behavioural efforts made by an individual for managing the external and internal demands (Haynes and Love, 2004; Lazarus and Folkman, 1984). It includes positive reappraisal (i.e., *rediscovering important things in life*), emotional support seeking (i.e., *leaving things open for somewhat*), and escapism (i.e., *refusing deep thinking*) (Chan et al., 2014).

### Conceptual Model

Based on the literature review, a conceptual model for the Mindfulness Characteristics– Coping Behaviours–Physical Stress has been developed for CPs (see Figure 1). It demonstrates that mindfulness characteristics are related to the physical stress and the coping behaviors of CPs.

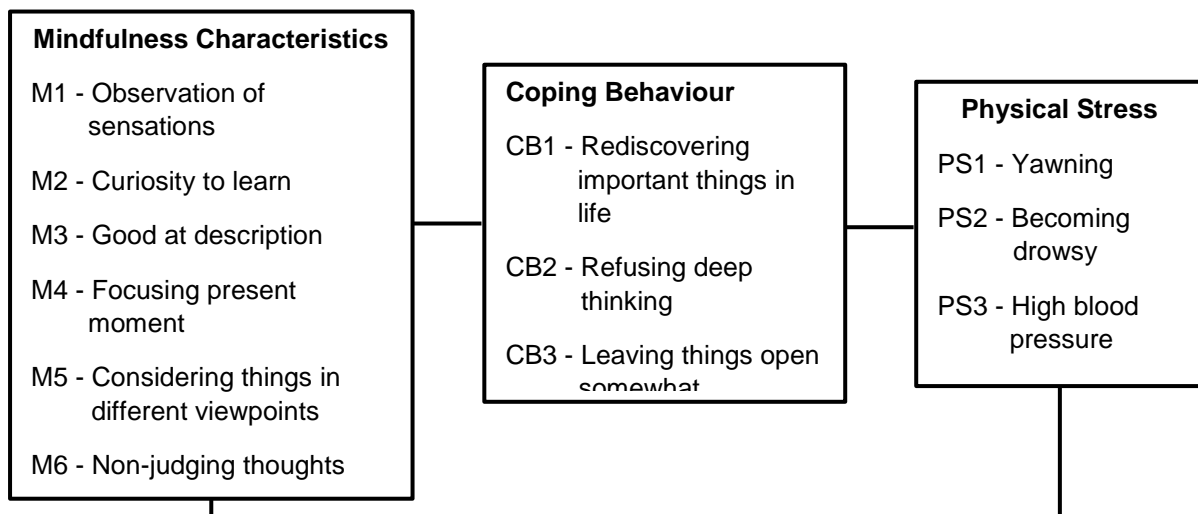


Figure 1 Conceptual Mindfulness Characteristics–Coping Behaviours–Physical Stress Model

## Research Method

This research aimed to examine the impact of mindfulness characteristics on CPs via an intervention study. CPs were recruited to participate in MBSR training adopted from Mindfulness-Based Stress Reduction (MBSR) training workshop (Kabat-Zinn and Hanh, 2009). Participants in the standard 8-week MBSR training workshop (2.5 hours per week) were requested to conduct mindfulness practice at home for 30-45 min every day based on a CD (i.e., guided mindful practices in each week). Those who joined the 8-weeks full MBSR training workshops were considered a sample group, while a similar group of CPs who did not participate in the workshop was treated as a control group.

To secure better reliability, a validated questionnaire survey was used. A final set of questionnaires was designed consisting of 4 sections: demographic information, mindfulness characteristics (Baer et al., 2004; Walach et al., 2006), physical stress (Greenberg, 2017), and coping behaviors (Chan, 2011; Lazarus and Folkman, 1984). All members graded the levels of agreement using a seven-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). Participants in both groups were requested to answer the identical survey before and after the workshop, i.e., self-administer questionnaires. An *independent samples t-test* was carried out to find the differences in mindfulness characteristics, coping behaviors, and physical stress items. *Pearson correlation* was also used to examine the strength and direction of the relationships among items using SPSS version 26.0.

## Results

### Independent t-test

An independent samples t-test was conducted to identify the differences of mindfulness characteristics, coping behaviors, and physical stress between the MBSR group and the control group (see Table 1).

Table 1 t-test for Mindfulness Characteristics, Coping Behaviors, and Physical Stress

Items	Pre-MBSR				Post-MBSR				
	Mean (P)	Mean (NP)	Mean Dif.	Sig. (2-tailed)	Mean (P)	Mean (NP)	Mean Dif.	Sig. (2-tailed)	
<b>Mindfulness characteristics</b>									
M1	Observation of sensations	4.308	1.702	1.713	0.238	5.846	3.231	2.615	<b>0.000</b>
M2	Curiosity to learn	4.154	1.463	0.967	0.507	5.231	3.231	2.000	<b>0.000</b>
M3	Good at description	3.539	1.561	1.536	0.042	4.615	3.308	1.308	<b>0.019</b>
M4	Focusing present moment	4.308	1.437	1.038	0.107	5.462	3.769	1.692	<b>0.002</b>
M5	Considering things different viewpoints	5.000	1.528	1.437	0.882	5.077	4.308	0.769	<b>0.049</b>
M6	Non-judging thoughts	4.231	1.166	0.961	0.754	4.615	4.308	0.308	0.502

M7	Letting go distress thoughts	4.385	1.557	0.776	0.818	5.000	3.539	1.462	<b>0.002</b>
M8	Experiencing self-separate from thoughts and feelings	3.692	1.437	0.870	0.120	4.846	3.615	1.231	<b>0.011</b>
<b>Coping behaviours</b>									
CB1	Rediscovering important things in life	4.615	1.261	1.301	0.451	5.692	4.077	1.615	<b>0.001</b>
CB2	Refusing deep thinking	3.846	1.573	1.013	0.883	4.308	3.462	0.846	0.082
CB3	Leaving things open somewhat	5.154	0.987	0.961	0.055	5.308	4.385	0.923	<b>0.021</b>
<b>Physical stress</b>									
PS1	Yawning	4.077	1.656	1.506	0.542	3.308	4.462	-1.154	<b>0.021</b>
PS2	Becoming drowsy	4.077	1.441	1.423	0.787	2.923	4.308	-1.385	<b>0.013</b>
PS3	High blood pressure	3.385	1.502	1.772	0.723	3.000	3.462	-0.462	0.507
PS4	High heartbeat rate	3.000	1.414	1.750	0.278	2.692	4.000	-1.308	<b>0.037</b>
PS5	Headache	2.923	1.188	1.871	0.092	3.154	3.923	-0.769	0.289

Notes: Bold text represents significant difference at 0.01 & 0.05 level (2-tailed); P=participant; NP=nonparticipant.

Before the training workshop, there was no any difference between the two groups. However, significant differences in most of the measurable items (mindfulness characteristics, coping behaviours, and physical stress) were revealed after the 8-week MBSR workshop. Among eight mindfulness items, seven items (except non-judging thought) showed significant differences between sample and control groups. The mean scores of all seven mindfulness items for MBSR group were significantly higher than the control group. Similarly, two items of coping behaviors (i.e., *rediscovering important things in life*, and *leaving things open somewhat*) were also scored significantly higher for the MBSR group than the control group. Interestingly, mean scores of all the physical stress items were reduced for MBSR participants in comparing with the control participants. Three physical stress items including *yawning*, *becoming drowsy* and *high heartbeat rate* were significantly reduced after the MBSR workshop.

### Pearson's Correlation Analysis

In order to investigate the strength and direction of the relationships among mindfulness characteristics, coping behaviors, and physical stress items, Pearson correlation was adopted (see Table 2). The results showed that, out of eight mindfulness items, seven items demonstrated significant relationships with the three items of coping behaviors and the five items of physical stress. *Observation of sensations* (M1) is significantly related to CB1 and CB3, while *Good at description* (M3) and *Focusing present moment* (M4) associated with all coping behaviour items (CB1-CB3). *Curiosity* (M2), *Considering things in different viewpoints* (M5) and *Letting it go* (M7) significantly linked to both CB1 and CB2, while *Experiencing self-separate from thoughts and feelings* (M8) only associated to CB2.

On the other hand, *Observation of sensations* (M1), *Considering things in different viewpoints* (M5), and *Experiencing self-separate from thoughts and feelings* (M8) are significantly negatively associated with all physical stress items (PS1-PS5). *Good at description* (M3) and *Letting it go* (M7)

negatively related to PS1-PS5 except for PS3, while *Curiosity* (M2) only has a significant relationship with one physical stress item (PS5). Out of the three coping behaviour items, only *rediscovering important things in life* (CB1) is significantly linked to all physical stress items (PS1-PS5).

Table 2 Correlation between mindfulness characteristic, physical stress, and coping behaviors

Note: “M” refers to Mindfulness; “CB” represent Coping behaviors and “PS” refers to Physical stress

\*\* Correlation is significant at the 0.01 level (2-tailed).

Items	CB1	CB2	CB3	PS1	PS2	PS3	PS4	PS5
<b>M1</b> Observation of sensations	<b>0.623**</b>	0.265	<b>0.403**</b>	<b>-0.338*</b>	<b>-0.341*</b>	<b>-0.576**</b>	<b>-0.395**</b>	-
<b>M2</b> Curiosity to learn	<b>0.429**</b>	<b>0.425**</b>	0.194	-0.158	-0.147	-0.236	-0.054	<b>0.488**</b>
<b>M3</b> Good at description	<b>0.470**</b>	<b>0.307*</b>	<b>0.431**</b>	<b>-0.297*</b>	<b>-0.352*</b>	-0.251	<b>-0.404**</b>	<b>-0.287*</b>
<b>M4</b> Focusing present moment	<b>0.554**</b>	<b>0.303*</b>	<b>0.503**</b>	-0.113	-0.232	-0.194	-0.236	-0.128
<b>M5</b> Considering things different viewpoints	<b>0.596**</b>	<b>0.314*</b>	0.270	<b>-0.405**</b>	<b>-0.362**</b>	<b>-0.447**</b>	<b>-0.304*</b>	-
<b>M6</b> Non-judging thoughts	0.107	0.130	0.207	0.031	-0.108	0.054	0.001	-0.053
<b>M7</b> Letting go distress thoughts	<b>0.446**</b>	<b>0.368**</b>	0.219	<b>-0.412**</b>	<b>-0.368**</b>	-0.230	<b>-0.460**</b>	-
<b>M8</b> Experiencing self-separate from thoughts and feelings	<b>0.458**</b>	0.157	0.190	<b>-0.403**</b>	<b>-0.363**</b>	<b>-0.279*</b>	<b>-0.375**</b>	<b>0.355**</b>
<b>CB1</b> Rediscovering important things in life	1.000	-	-	<b>-0.575**</b>	<b>-0.595**</b>	<b>-0.455**</b>	<b>-0.410**</b>	-
<b>CB2</b> Refusing deep thinking	0.305*	1.000	-	<b>-0.361**</b>	-0.139	-0.056	-0.119	<b>-0.337*</b>
<b>CB3</b> Leaving things open somewhat	0.263	0.052	1.000	0.076	-0.133	0.006	-0.042	0.000

\* Correlation is significant at the 0.05 level (2-tailed).

## Discussion

The present study reveals that the MBSR training is an effective intervention and produces a significant improvement in coping behaviours as well as the reduction in the physical stress of CPs (see Figure 1). The distinctive effect of the MBSR workshop on CPs is discovered in the findings. There is no difference found between sample and control group in their mindfulness characteristics, coping behaviours, and physical stress before the MBSR workshop. However, after the MBSR training, majority of mindfulness characteristic items, including *observation to sensations*, *curiosity to learn*, *good at description*, *focusing present moment*, *considering things in different viewpoints*, *letting go distressing thoughts*, and *experiencing self-separate from thoughts and feelings*, are considerably enhanced, and three out of five physical stress items (*yawning*, *becoming drowsy* and *high heart rate*) are decreased among the MBSR participants in comparing with the control group. Similarly, this mindful training also helps in the improvement of two coping behavior items (i.e., *rediscovering new things in life* and *leaving things open to somewhat*) of the CPs (see Figure 2).

### **Mindfulness Characteristics and Physical Stress**

Interestingly, after MBSR workshop, CPs have successfully reduced their physical stress including *yawning, becoming drowsy, and high heartbeat rate*. Indeed, the process of *active observations, expression of feelings into words, beginner's mind, letting go distress thoughts, and decentering* are those constructive cognitive processes for empowering and transferring negative thoughts into positive meanings (Garland et al., 2009). This meaningful understanding of stressful life events leads to a significant reduction in physical stress by mindfulness characteristics *via* MBSR (Garland et al., 2011; Hewstone et al., 2007). Therefore, MBSR participants can manage their demanding, complicated, and multi-tasks through keen observations, good communications, different ideas, non-reactive thoughts, and present focus, which consequently reduce their physical stress.

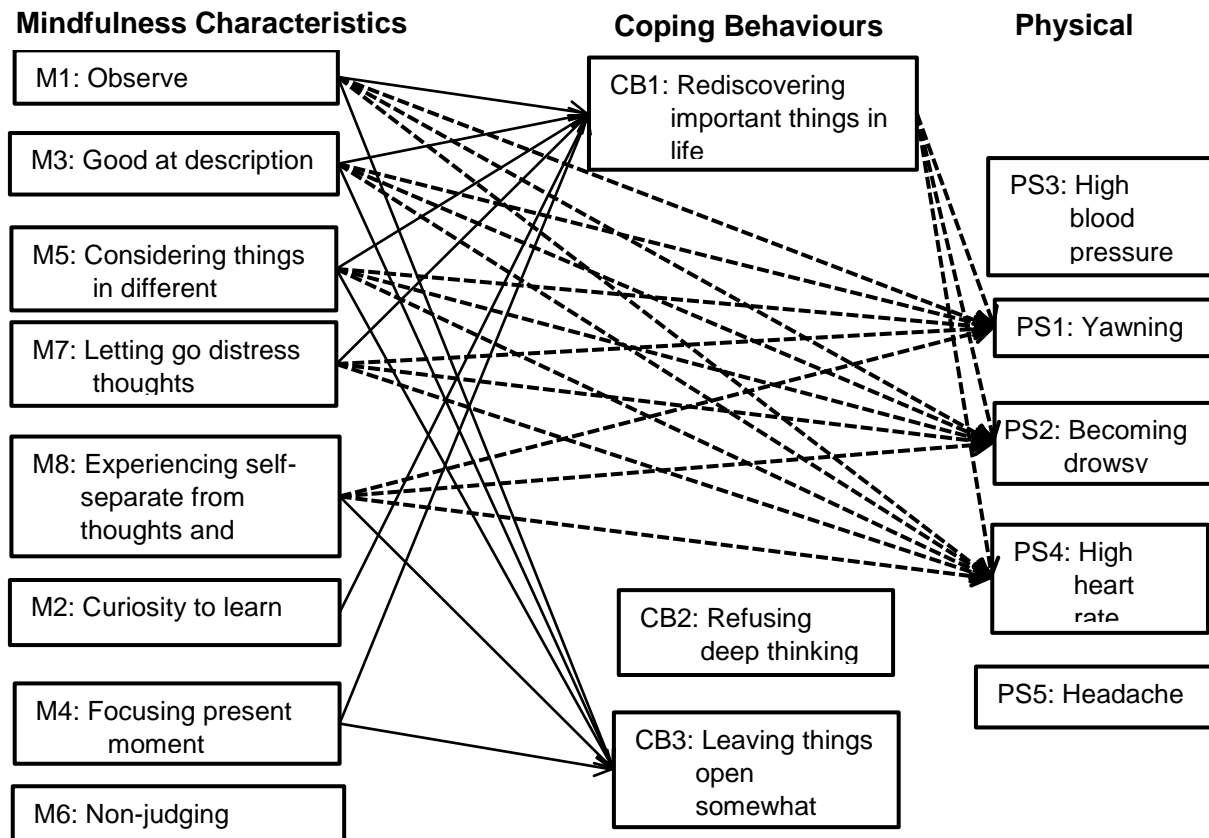
Furthermore, mindfulness practices support participants to hold severe emotions and feelings, which can relieve suffering. It is believed that changing the perception of CPs to see the complaints in a new light reduced their stress without keeping on the past and/or future worries (Carlson, 2012). Therefore, various physical stress symptoms of CPs, such as high heart rate, yawning, and drowsiness are subsequently decrease after the MBSR workshop (Delizonna et al., 2009; Simpson et al., 2019). In fact, mindfulness training involves breathing, attention control, emotional acceptance, etc., to alleviate the negative impacts of stress on physical health. Furthermore, many positive features of mindfulness play an important role in the mitigation of stress. For instance, *focusing on the present moment* enable CPs to alert their body conditions and dangers, as well as prevent unnecessary use of physical efforts in their tasks. Thus, it can be claimed that MBSR workshop has cultivated numerous positive behaviours among the participants in comparing with the non-participants.

### **Mindfulness Characteristics and Coping Behaviours**

Positive relationships were revealed between the six items of mindfulness *and* a positive reappraisal coping item (i.e., *rediscovering important things in life*). MBSR has enhanced the positive reappraisal by cultivating careful observation, well-expressed emotions, different viewpoints, letting go attitude, curiosity, and focused mind. These mindful characteristics can reframe the issues and rediscover the important things at the job of CPs (Garland et al., 2009). Ultimately, through such a cognitive process, a stressful event can be altered into beneficial and valuable meanings (Garland et al., 2011). In fact, mindfulness characteristics can assist CPs to think in broader aspects, enabling to assess available information and the situation more objectively and non-judgmentally, to manage their stress. In short, mindfulness practice has helped the CPs to reorder their priorities in life, to maintain the coping, and to reduce the stress (Desrosiers et al., 2013; Hewstone et al., 2007).

On the other hand, emotional support seeking item was improved after the MBSR workshop, while majority of mindfulness characteristics have played a vital role in this increment. All the participant CPs have improved their describing skills via the MBSR, which empowers their confidence to seek emotional support from others (Hampton et al., 2018). It is believed that good communication can help to express their feelings more easily, clearly, and confidently with their close one to relax themselves (Leung et al., 2016). Additionally, other features of mindfulness, including attentive observations, different perspectives, and more focused mind have facilitated CPs to secure trust and attachment with their colleagues (Khaddouma et al., 2017), and eventually ease in emotional support

seeking (Shaver et al., 2007). Therefore, it can be claimed that MBSR workshop has improved coping behaviors through enhancing mindfulness characteristics.



Notes: - - -> significantly negative relationship demonstrated by t-test and correlation;  
 ———> significantly positive relationship demonstrated by t-test and correlation.

### Recommendations

After the MBSR workshop, many mindfulness characteristics were improved, particularly describing ability. Through the MBSR workshop, CPs got an effective platform to enhance their communication ability. It is believed that describing skills can reduce conflicts and misunderstandings during communication with colleagues (Burgoon et al., 2000). Therefore, construction companies are suggested to organize informal sessions and competitions, which involve deep observations, out of box thinking, and curiosity (for example physical games, chess, board games, etc.) once a week at the workplace. In such informal activities, CPs can express their personal feelings and difficulties both verbally and non-verbally. It will not only enrich their describing and communication abilities but also strengthen their relationships among employees. Ultimately, these attributes will refresh the CPs mind and body, and help to release their stress.



Drowsiness and yawning can be recognized as a lack of activeness and attention towards the jobs, which can mitigate the performance of CPs. After the MBSR workshops, CPs have reduced these attitudes. Indeed, mindfulness training has many beneficial effects, such as improvement of regulated attention, reduction of wandering mind, enhancement of acceptance, and so on (Modesto-Lowe et al., 2015). Additionally, stretching practices like yoga will serve as an exercise. It can diminish the influence of many physical health problems, such as high blood pressure, heart disease, and obesity (Fletcher, 2011). Hence, the MBSR training workshop should be adopted in every occupation, especially in the construction industry, for tackling physical health problems and improving stress management.

This study collected data only during an eight-week intervention workshop (i.e., two and a half months), but we were unable to establish the long-term impact of MBSR. A longitudinal study is suggested in the future study for addressing potential barriers associated with long-standing practices to comprehend the variations on the same subject over a long period (Murphy, 2012). In addition, the use of only self-report survey data may involve the risk of social desirability and the inevitable bias in the findings and, thus, more objective approaches should be studied in the future. However, it should be noted that several measures were adopted in the study in order to ensure the reliability of the items including extensive literature, factor analysis, and reliability test. This study only developed the Mindfulness-Coping Behaviours-Stress model for CPs. Further studies can be done to investigate the impact of MBSR on the management of stressors and the performance of CPs. Triangulation of measures and appropriate control will empower more exploratory investigation for unidentified variables. Future studies are encouraged to use a triangulation research method including longitudinal, experimental, and self-report measures together. Additionally, large sample sizes are required to confirm the impact of MBSR practice for different construction personals.

## **Conclusions**

This research has identified the impact of MBSR workshops on CPs, particularly for reducing their physical stress and improving coping behaviours. The efficacy of intervention can be noticed before and after the workshop. In the commencement of the workshop, there is no difference between the control and sample group. However, MBSR participants have considerably increased their mindfulness characteristics, improved their coping behaviours and decreased in physical stress. It shows that mindfulness including observation of sensations, curiosity to learn, good at description, focusing present moment, considering things in different viewpoints, letting go distress thoughts and experiencing self-separate from thoughts and feelings have played the pivotal role in improving coping behaviours and reducing the physical stress of CPs. The results revealed the positive changes and confirmed the effectiveness of mindfulness training on CPs. The construction companies are suggested to offer various platforms for CPs to deal with stress. Hence, it is recommended to organize an informal gathering, social activities, and regular stress management workshop like MBSR training. Such a programme will not only reduce their stress but also help to cultivates various positive approaches, for example, communications, broaden views, attention, and so on. Future studies should include triangulation method with a large sample size to further strengthen the impact of the MBSR workshop in stress management.

## Acknowledgements

The work described in this paper was fully supported by a grant from the Strategic Research Grant, CityU (Project No. 7005045).

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