



## Preventing construction worker injury incidents through the management of personal stress and organizational stressors

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### ABSTRACT

Construction workers (CWs) are positioned at the lowest level of an organization and thus have limited control over their work. For this reason, they are often deprived of their due rewards and training or sometimes are even compelled to focus on production at the expense of their own safety. These organizational stressors not only cause the CWs stress but also impair their safety behaviors. The impairment of safety behaviors is the major cause of CW injury incidents. Hence, to *prevent injury incidents and enhance safety behaviors* of CWs, the current study aimed to identify the impact of various organizational stressors and stress on CW safety behaviors and injury incidents. To achieve this aim, we surveyed 395 CWs. Using factor analysis, we identified five organizational stressors (unfair reward and treatment, inappropriate safety equipment, provision of training, lack of goal setting, and poor physical environment), two types of stress (emotional and physical), and safety behaviors. The results of correlation and regression analyses revealed the following: (1) *injury incidents* were minimized by safety behaviors but escalated by a lack of goal setting, (2) *safety behaviors* were maximized by moderate levels of emotional stress (i.e., an inverted U-shape relationship between these two variables) and increased in line with physical stress and inappropriate safety equipment, (3) *emotional stress* was positively predicted by the provision of training and inappropriate safety equipment, and (4) *physical stress* was predicted only by inappropriate safety equipment. Based on these results, we suggest various recommendations to construction stakeholders on how to prevent CW injury incidents.

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### 1. Introduction

Construction workers (CWs) refer to a group of frontline staff who contribute to the various work trades involved in various construction projects, including concrete work, machine and crane operation, plumbing and piping, painting, electrical work, and carpentry (Census and Statistic Department, HKSAR, 2009a). Because they have the most significant and direct impact on the project outcomes of time, cost, and quality, they are the most valuable employees in every company (Applebaum, 1999). However, the CW occupation has long been recognized as one of the most dangerous (Health and Safety Executive, 2006), in terms of both its annual industrial accident (63%) and fatality (79%) rates, which are the highest of all industries in Hong Kong (Census and Statistics Department, 2009b). In fact, in Hong Kong, a total of \$910 million

per year is paid in compensation to injured employees or family members of deceased CWs (Labour Department, 2002).

In view of the above, a number of research projects have investigated the safety issues in the construction industry (Dong et al., 2009; Hinze and Wiegand, 1992; Toole, 2002). As prevention of injury incidents is one of the principal aims of safety management, it is essential to identify the causes of injury incidents and develop correspondent prevention measures in the industry (Hollnagel, 2004). The extensive literature had identified various factors for the prevention of injury incidents, including construction job tenure (Dong et al., 2009), appropriateness of off-highway plant and equipment (Edwards and Nicholas, 2002), designs of construction sites (Gambatese et al., 2008; Hinze and Wiegand, 1992), defensive versus responsible attribution of injury incidents (Hasle et al., 2009), site safety management (Toole, 2002), and so on. However, research investigating the impact of organizational stressors and stress on CW safety is lacking.

As CWs are positioned at the lowest level of an organization, have limited power over resources and goals at work, and work within a crisis-ridden site environment, CWs are 1.7 times more likely than workers in other industries to suffer from stress (Petersen and Zwerling, 1998). They also have the third highest stress levels of any occupation worldwide (International Labour

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