

Chapter 19

Health Impacts of Construction Workers: A Short Introduction



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Abstract Construction workers are the key and indispensable contributors to every construction project. For many years, the construction industry has been documented, having a great possibility of occupational illnesses, injuries and accidents. Such threats of construction workers can result in social problems and low productivity. Accordingly, construction workers' well-being ought to be extremely self-addressed to boost competency and potency. The factors like rising temperature and warmth stress risks within the dynamic climate state of affairs may doubtlessly have an effect on the workers globally, particularly those with strenuous work in tropical settings. Filth generated by construction activities deeply affects air quality and adversely affects the health of people residing near to construction sites. All through this book chapter, the authors aim to investigate the factors that have an effect on construction workers, continuing health supported by a scientific review of revealed research within the vicinity of construction. Conclusions from the study can give solid evidence of the causes and results of construction workers' future health.

Keywords Construction · Low productivity · Social problems · Unsafe conditions · Workers' health

19.1 Introduction

Construction activity is one of the main threats around the world as a tough, significant, and labor-intensive industry (Mahmoudi et al. 2014). Substantial injuries and illnesses forever cause the decline of craft efficiency, work eagerness and an increased delinquency rate. During this case, the labor potency and productivity enhancements arise from the hope that a healthier hand needs less input, produces a lot of output of higher excellence and performs better (Ødegaard and Roos 2014). On the other hand, the development trade additionally may have a harmful result on the psychological welfare of workers because of excess activity demands in manufacturing

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projects that may additionally have an undesirable pressure on individual and structure performance (Love et al. 2011). For that reason, construction workers' potency and yield is improved by focusing on the mental state and physical health (Yorio and Wachter 2014; Martin et al. 2016).

With the intensive employees that the development business employs, health and caring problems within the housing industry became necessary, since the business continues to be the one among the most casualty and accident rates (Zhou et al. 2015). Consequently, wellbeing and safety management within the housing industry ought to be extremely increased; thereby serving construction organizations to bring about their H&S objectives. On the other hand, several studies are conducted to boost the security presentation of construction projects, a very few studies have centered on the health organization facet. The relationship between health managing and work outcomes has not been fully examined (Kwon and Adler 2014; Oswald et al. 2015). Moreover, the effect of an SNC on labor presentation conjointly ought to be known so as to assist construction organizations to cut back work pressure, improve work potency, productivity and improve the social capital (Thomson et al. 2017).

The pivotal role of workers is central to almost all types of construction activities. No description of luxuries of this world would be complete without accepting the importance of the occupational/working class. While it is true that working class is making construction of physical infrastructure and allied things possible, it is largely at the cost of their precious health. The construction industry in its multifarious nature has consumed a lot of precious human lives of occupational groups. Workers, most often while working for a living, eventually become diseased due to working in bad working conditions. The construction activities have been flourishing at the cost of working or occupational groups who are at the greater risk of working places and environment. The unsafe working conditions and other equally hazardous situations have left the working class at the receiving end.

The working class is becoming an ever growing victim of unsafe working places in two ways. The first category of disadvantageous health related problems are accidental or visible ones. This category would include physical injuries, accidents, accidental deaths and other daily issues. Thanks to a number of pro-labour constitutional safeguards these immediate hazards are being taken into account with some immediate measures of relief. However the hidden invisible and the long term impacts of construction activities affecting the precious lives of the working class are not being taken into account. The long term impact on human health of occupational groups or simply termed as occupational human health has not been fully understood. The lack of will to accept the long term impacts of unsafe working conditions is adding insult to the injuries.

When operating in unsafe building environments, there are few advanced risks that are implemented to protect a stable and healthy working environment. The gruesome picture demands ample attention. The welfare and health condition of construction employees require empathetic support of the research community and pro-labour government policies. On the academic front over the last few years multiple efforts have created a foundational ground to discuss the long term health impact of the construction industry with special reference to the working class. It has been found

that due to several constitutional measures all across the world construction industries seem to be bound to cater and address the immediate health impacts of the working class. Number of construction industries are making an account of Injuries, deaths, accidents and providing some relief to the class. However the long term impacts are not the concerns of construction corporations. Over the recent few years a handful of studies have been able to examine and investigate the long term effects of construction works on the workers' health. These studies, founded on the data generated by a number of agencies like National Institute for Occupational Safety and Health (NIOSH 2018) and Occupational Safety and Health Administration (OSHA 2019), sensitizes the issue by exploring the long term toll of human health of the laboring class. These studies are predominantly the struggles of investigators and specialists addressing the security issues (Zuluaga et al. 2016). Their overall emphasis is to develop the safe climate and surroundings of the construction manufacturing units (Pandit et al. 2019). They desire to highlight the longstanding effects of construction work on workers' health which have hardly been cited. Such studies have been able to establish the long term consequences of toiling in harmful, harsh, unhygienic working places and how the current safety measures are meant only to address the immediate effects (Sacks et al. 2009). By coining terms like occupational health, occupational disease, chronic diseases and a ratification of the same by the world health organization, studies focusing on long term implications of inhumane working conditions express primarily elimination of hazards as a pertinent need.

A few studies, quite recent in date, have been able to locate the influence of climate variation on the workers' health. The increasing global temperature is affecting the working class associated with the construction industry by developing a heat stress. Workers with least knowledge of increasing global temperature have become greatly vulnerable. On a regular basis they are facing troubles, accidents and diseases which they rarely heard of in the past. The thrilling heat due to varying climate, sideways with additional factors upsurge the susceptibility of construction workers to heat strain (Xiang et al. 2014). The growing heat stress is becoming a global phenomenon. There has been higher gratitude for high temperature hazards to agricultural staff because of perceptibly greater heat-related mortality rates within the industry (Jackson and Rosenberg 2010). Studies have documented a high frequency of warmth stress connected symptoms among North American nation migrant farm staff (32%) (Fleischer et al. 2013), Japanese forest staff (32%) (Maeda et al. 2006), Costa Rican sugar cane staff (Crowe et al. 2013), and South African horticulture staff (Mathee et al. 2010).

Heat strain considered as a direct outcome of environment change poses a considerable risk to construction workers globally. More people are facing it. One study shows in the U.S. construction workers are 13 folds more expected to perish from a heat-related illness (HRI) related to workers in different trades, and inside the industry, road construction workers and roofers face predominantly a high threat of HRIs (Gubernot et al. 2015). It is being estimated that the extreme heat on account of greater global change in climate would result in substantial enhancement in the susceptibility of construction workers to high temperature stress. The growing heat stress would have a huge impact not only on the workers' health, it is expected

it would even hamper the growth of the global construction industry. Under such circumstances distinctive consideration necessities to be compensated to the threats faced by the worldwide construction staff from professional heat stress.

The growing climatic concerns and its impacts on workers' health are becoming alarming. The emission of greenhouse gasses makes the scientific community vocal in saying climate change is happening with a universal trend of growing temperatures (Change 2007). Consequently, the quantity of maximum scorching days is estimated to last longer with additional regularity and strength within the future (Meehl and Tebaldi 2004). And there are square measure studies that show a positive correlation between scorching temperature and injury claims (Xiang et al. 2014). And there are studies that show a positive co relationship between increasing temperature and wound claims (Xiang et al. 2014). The increasing heat waves or heat stress had direct bearings on the workforce by causing more work-related complaints and damages in temperate climatic conditions. While heat waves of heat stress affect the workforce in all types of working environment it is outdoor working conditions that have become gruesome. Largely outdoor industry workers during heat waves have witnessed more fatalities and brutal experiences of being victims of growing heat stress. (Maeda et al. 2006; Mathee et al. 2010; Crowe et al. 2013; Fleischer et al. 2013), with the bulk displaying that heat pressure levels outdo the suggested criteria of Yankee Conference of Governmental Industrial Hygienists (National Institute for activity Safety and Health (NIOSH) 1986).

Almost all outside employees are one or other getting affected by the heat stress. However amid unsafe working conditions the section of outside workers undertaking very intensive and physical actions suffer more. They face a relatively great threat of heat-associated illnesses and damages during exceptionally scorching weather. What adds more to their problems is the lack of precautionary measures that are not satisfactorily adopted. The picture of outdoor workers affected by heat stress is more pathetic in a number of middle-low revenue countries (Kjellstrom and Lemke 2009). Heat stress is causing greater challenges for outdoor workers and the construction industry seems to be least aware of it. The available data proves that heat stress is consuming more lives and inflicting more injuries. It is believed that due to heat stress increases the number of potential injuries as workers suffer with less attention and management, wet palms, fogged-up protection glasses, and unintentional contact with scorching surfaces. Kjellstrom (2009), Kjellstrom and Lemke (2009) argue that due to climate change, contact to dangerous heat in the factory can upsurge the risk of work-associated damages and calamities, chiefly for those operating outside or close to high temperature sources.

It is being explored to what extent employees are affected by high temperature influences i.e. when ambient heats remain greater over numerous uninterrupted days. It is probable that it may have consequences on an employee's level of tiredness and negotiation of wellbeing and protection. The climate resulting in heat stress is however affecting men more as compared to the women. This perhaps owes to

the fact that men are involved in more intensive physical work in outdoor environmental conditions. More importantly it has been found that heat stress impacts more middle-aged employees (35–54 years), tradespersons, transitional fabrication and transportation employees and workers.

19.2 Work-Related Illnesses and Injuries

Heat strain considerably upsurges the amount of the ‘shocking injuries’, ‘injuries, musculoskeletal and connective tissue ailments, slashes, and amputations’. The maximum common damages and criticisms are ‘body stressing’, ‘striking objects with a portion of the body’, trips, falls and slides of a person’. Grievance claims through high temperature waves for ‘being smashed by moving objects’, ‘chemicals and other constituents’, electricity, and ‘heat, and other ecological factors’ have also grown. Mechanism-specific evaluation shows that employees are smashed by moving objects enhanced by 9.7% during high temperature waves. Central temperature advancement and sunstrokes can result in lethargy, fatigue, laziness, and failure of attentiveness which might be responsible for these damages. The noteworthy intensification of wounds due to ‘interaction with harmful chemicals’ during high temperature waves might be due to employees dropping the use of protective kits like personal protective equipment (PPE) under situations of life-threatening hotness (Park et al. 2009), or the amplified incorporation frequency of liquid substances through the skin in advanced ambient temperatures (Cherrie et al. 2004). Grown-up male laborers are at larger risk of heat-associated deaths. Similarly agronomic laborers die more due to heat strain (Petitti et al. 2013). Grown-up and elderly males and females cannot tolerate heat and are more expected to be affected from physiological high temperature anxiety than younger persons (Blatteis 2012). In the course of heat waves more persons become exposed to chemical constituents (Park et al. 2009). Outside male employees and tradespersons, persons employed in ‘forestry and fishing’ farming, and water, electricity, and gas manufacturing units are at greater threat of damage during heat waves. Work-related burns, cuts, amputations, and heat ailments are health consequences meaningfully related with thrilling heat.

19.3 Musculoskeletal Ailments as the Major Occupational Disorders

One of the core concerns of studies on long term consequences of working in unsafe and safety-less working environments was to provide a list of diseases affecting the working class. The long-term health impacts commonly found prevalent in the construction workers are MSDs, audible damage, breathing exposures, skin ailment, and psychosocial symbols. Spielholz et al. (2006) terms Musculoskeletal Disorders as

the major work-related ailment in the production industry. MSDs Symptoms include body pain largely found in lower back, neck, shoulders, joints, hands and other kinds of ache (Wang et al. 2015). MSDs are the outcome of a set of factors and may often include Bodily exposures, lifting heavy loads, uncooperative lifting, recurrent back bending, greater vibrations, life-threatening temperature (Wang et al. 2015). Manual material handling, especially the mechanism of lifting, often leads to MSDs (Valero et al. 2016). MSDs are commonly found in the construction workers associated with masons, carpenters, brick makers and heavy material controllers (Valero et al. 2016).

19.4 Respiratory Diseases

Respiratory diseases constitute another portion of occupational diseases which are taking a toll on occupant groups. The large scale dust production during construction, with a total suspended particulate matter (TSP), fine particulate matter and coarse particulate matter causes respiratory diseases (Paschalidou et al. 2016; Yan et al. 2018). The particulate matter (PM) has opposing properties on human healthiness. Studies show that it causes many respiratory diseases (Le et al. 2017; Sanyal et al. 2018; Kowalska et al. 2019). Continued contact to air pollutants cause tumors (Kim et al. 2018). Respiratory diseases in occupational groups are common due to longer exposure to dust, especially lead. Oliver et al. (2001) has found dust a main reason leading to respiratory disorders. Asbestos, similarly, are potential reasons for respiratory diseases (Everatt et al. 2007). Likewise other forms of dust such as silica dirt, solvent and isocyanate vapors, and other poisonous constituents cause main respiratory ailments. In a major study it has been found that Lead dust is an active agent in promoting occupational diseases like damaging of respiratory organs (Levin and Goldberg 2000). Working with activities generating different types of smoke and glasses also causes respiratory problems (Bakke et al. 2001). Synthetic paints used for the purpose of polishing, finishing and painting are significantly causing respiratory problems (Kaukiainen et al. 2008). Paintings leading to respiratory problems have been described by Park et al. (2016) and (Meijer et al. 2001). Beaudry et al. (2013) believes that tunnel workers are more susceptible to respiratory disorders due to production of large quantities of dust and deficiency of qualitative air to breathe.

19.5 Hearing Problems

Loss of hearing power is one of the occupational diseases which have been trending. Working in high sound creating construction sites causes loss of hearing. The high sound affects the working groups gradually and makes them hear sounds only at high volume or they stop hearing. The hearing disabilities due to noise, dust and other hazardous conditions of the workplace are rendering most of the workers as long term impacts of constructional noises. In a study it has been found that between

60 and 70% of the building employees suffer everyday contact to a noisy condition all over their functioning day (Fernández et al. 2009). The noise at construction sites plays a destructive role. According to Li et al. (2016) such noise comes from machines, comprising air compressor appliances, rebar cutting, digger engines, and bending machines. There are a number of studies that show the harmful effects of noise like working conditions. Noise due to constructional activities had long term impacts of hearing (Lee et al. 2019). Frequent exposure to heavy noise created by Construction machinery and equipment substantially adds to the hearing problems (Kwon et al. 2018). It has been established that those working construction apparatus or working near the equipment are more likely prone to hearing disorders. Likewise men working as ironworkers, carpenters and masons suffer with hearing diseases (Seixas et al. 2005).

19.6 Skin Diseases

Skin diseases of divergent scales with potential to affect the patients majorly are largely found in occupational groups. It has been reported that Occupational skin diseases (OSD) are one of the hazardous outcomes of construction manufacturing units (Bock et al. 2003). Timmerman, et al. (2014) argues that construction workers are more prone to OSD. It has been found that long-term outdoor working increases the risks of OSD. Varghese et al. (2019) opines that heat and cold exposure of workers increases chances for increasing skin diseases. Likewise long exposure and working with hazardous chemicals such as epoxy resin, chrome iron, cobalt chloride, potassium dichromate etc. causes skin diseases (Bock et al. 2003).

19.7 Psychological Diseases

Construction workers have also been found vulnerable to the number of psychological and social problems. Being under the burden of heavy weights, lifting like activities, their mental health deteriorates. As their High psychological demands fall apart they descend to depression. According to Boschman et al. (2012) the little job gratification, low community support, greater work-associated stresses including post-traumatic stress often takes a toll on their health. Most common symptoms comprise high necessity for rescue after work (14%; 25%), distress (5%; 7%), dejection (18%; 20%), and post-traumatic stress disorder (11%; 7%) (Boschman et al. 2013). High workload with meager income also damages their mental peace (Maqsoom et al. 2018).

19.8 Recommendations

Central to aforementioned studies is the concern that working class or occupational groups are at the receiving end in the construction industry. Their precious lives are in peril due to heat stress, unsafe working conditions and working behaviors. The precious working force and its protection is a greater possibility. Indication displays that construction employees in Japan are not bodily defied by heat strain if actual deterrence procedures are taken on construction places (Morioka et al. 2006). Similarly the heat strain organization strategy of Construction, Energy Union and Forestry and Mining needs to be implemented and extended. To avoid heat stress work must be regulated, delayed or shifted to shadowy intervals. Likewise work in morning or evening hours may protect workers from getting exposed to heat stress. Role of technology in eradicating the heat stress has also been found crucial especially by making workers to work under air conditioner conditions, proper sops and work protocols prevents workers from a number of long term health impacts. Additional to field tools to display heat pressure conditions (Jackson and Rosenberg 2010), enforceable permissible guidelines may be looked-for to make sure the employment of heat stress regulation and prevention values such as California Code of Regulations, Title 8, Section 3395 (2014), mostly in industries with a huge percentage of temporally engaged non-union workers. Workers need to be regulated as the age, experience according to regulations received by enforcing agencies. For example it has been stated that compared with older workers, fresh workers are more susceptible to work-related wounds due to undertaking more vigorous jobs and absence of security training and services (US for Disease Control and Prevention 2003; Xiang et al. 2014). By regulating their working hours, a precious part of human capital would be saved.

Consequently, age-linked dissimilarities in the susceptibility to heat-related injury or accident should be taken into consideration when evolving new heat prevention strategies and regulations and service procedures. This highlights the importance of continued instructions in the use of PPE during high temperature waves among those unprotected to chemical constituents (Park et al. 2009). While construction industry counts the immediate health hazardous to some extent there however seems least awareness among occupational groups about the long term implications of the work they are engaged in. Many chronic health problems prevalent in the working class are actually an outcome of long term impacts of the nature of their job. From all these studies it is obvious that impacts of unsafe working conditions and behaviors would eventually deteriorate the health of occupational groups. The several pollutants generated at the construction sites spoil workers. They had least information about the chemicals, dust, gas and solvents that made them vulnerable to a number of diseases. Nearly all kinds of lasting health influences are due to insecure performances in dangerous atmospheres. MSDs, respiratory exposures, hearing loss skin disease, and psychosocial symptoms, cardiovascular diseases and other long term impacts are something that could be managed and mitigated to a greater extent.

The unsafe working behavior and less pro-working class conditions have been the basis for a number of risk factors. Consequently their alteration would ensure safety and long-term health of workers. Construction industry is required to restrain long term impacts like MSDs, respiratory exposure, hearing loss, skin diseases, and psychological symptoms. The need of the hour is therefore to expect the production units to place sufficient care to workers' health. Furthermore, it is predicted that the outcomes from this chapter will offer the industry more evidence about how to offer a safe atmosphere and how to safeguard safe worker performances on construction sites.

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