A PRELIMINARY STUDY OF HEALTH PROBLEMS AMONG CONSTRUCTION WORKERS IN MALAYSIA

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ABSTRACT

The Department of Occupational, Safety and Health reported that out of 172 investigated construction accidents in 2014, 42% involved death. Although this rate is lower than that for manufacturing plants, lost work-day rates are higher for several individual construction trades and for certain types of injuries. Since the lost work-day rates for small to medium sized construction companies are higher than that of similar-sized manufacturing plants, it will cause economic loss to the construction companies more than the others. Studies have found that health conditions also contribute to construction safety issues. These raise questions about the health level among construction workers in Malaysia prior to looking at their effects onto construction safety issues. Therefore, this preliminary study aims to identify health issues among them. A total of 335 respondents responded to a survey distributed among construction workers. It was found that the top health problems recorded to affect the workers were musculoskeletal disorder, eyes, nose and throat problem, fatigue and headache. The findings provided a further insight on the seriousness of certain types of health problems that affect construction workers working in the construction industry, hence medical cost or insurance should be an important cost element that needs to be considered by a Quantity Surveyor in building up a project cost.

Keywords: Health, Safety, Construction Workers, Malaysia.

1. INTRODUCTION

Construction industry is a booming industry for developing countries. The industry has immense continuous potential in generating a tremendous amount of employment, accounting to around 7% of the total employed workforce around the globe (Economy Watch, 2010). The rapid development of construction industry relies on construction productivities, which in turn concerns with health conditions of the construction workers. Construction productivities are very much dependent on the workers' health, adequate nutrition and industrial discipline because these determine the predictable availability of labor (Thomas & Frankenberg, 2002).

Construction sector is highly risky due to its production processes and labor-intensive characteristic. Owing to that, occupational accidents bring the sector up against large-scale financial loss. Each year in the British construction sector, around 3% of workers suffer from an illness they believed to be work-related and 3% of workers sustain a work-related injury, leading to 1.7 million working lost days (Health and Safety Executive, 2015). In Turkey, the cost of workday loss caused by major occupational accidents is USD19,431.75 and minor occupational accidents caused a loss of USD6,924.25. The costs of workday loss caused by minor occupational accidents are almost 35% of major workday losses (Yilmaz & Çelebi, 2015). These costs elicit the importance of preventive measures for workers' health and safety in construction.

In the Malaysian context, a database on construction workers' health statistic is still lacking. Prior to understanding how does safety and health influence Malaysian construction sector, it is important to first determine the common health issues among construction workers. The findings are believed to be crucially useful in ascertaining the financial analysis for construction companies. Therefore, this paper aims to identify the common health problems among construction workers who are working in the construction environment in Malaysia.

2. LITERATURE REVIEW

Construction sector is widely recognized as the sector with high accident rates due to its working nature that needs to deal with heights, involve electrical tools, expose to harmful chemicals, noise, vibration as well as uncomfortable temperature. Having to work in such environment, several health problems such as dermatitis, hearing loss and whole-body vibration are increasingly evident among the construction workers. This scenario has motivated researchers around the world to carry out study to enhance their understanding relating to health issues among construction workers. Research conducted in Malaysia by Ali, Kamaruzzaman and Sing (2010), Hamid, Majid and Singh (2008), and Zakaria, Mansor and Abdullah (2012) showed that that the main causes of accidents at construction sites were workers' negligence, failure to obey the work procedures, work at high elevation, operate equipment without safety devices, poor site management and low skill and knowledge. Findings showed that the construction workers who lost their concentration during work and felt fatigue due to poor health conditions had led to higher chances of getting into work accidents.

Another study on port site accidents by Mansor, Zakaria and Abdullah (2011) focused on two common dimensions of workplace accidents, namely individual and job-related factors. Using 177 surveyed samples, correlation test results showed that stress and fatigue, unsafe action, machinery and tools, design of workplace, training procedures were the significant factors that had contributed to workplace accidents. Goldenhar et al. (2003) conducted an exploratory ethnographic study to examine the relationship between working overtime and health and safety in construction industry. Focus groups undertaken with 64 construction workers in the United States indicated that health and safety issues were their primary concerns. However, they also raised concerns related to working overtime and the effects of working overtime. Research had also been carried out among the German construction workers, and the findings revealed an increasing number of respiratory problems, cancer and musculoskeletal disorders (Arndt et al., 2005). Stocks et al., (2010) also reported an increasing number of contact dermatitis, mesothelioma, lung cancer, skin neoplasia, benign pleural disease and pneumoconiosis among the UK construction workers. Other than physical health issue, there is a recent research on prevalence of mental health complaints among the construction workers. Boschman et al. (2013) measured the mental health effect among bricklayers and construction supervisors. They then discovered that high working speed and quantity were associated with symptoms of depression for both professions. Low level of decision-making and social support from the direct supervisor were also associated with symptoms of depression among construction supervisors.

The impact of health and safety hazards for construction workers in developing countries is 10 to 20 times higher compared to the other countries (Tadesse & Israel, 2016). Thus, understanding the construction workers' health problem is crucial for prevention and mitigation measures.

The review of literature related to construction worker health issues has revealed 13 health problems. Table 1 shows the many potential health problems that have been reported to be affecting construction workers. These problems were also surveyed among the construction workers in this study.

Table 1: Health problems among construction workers

Health problem	Source
Cardiovascular	Cavallari, Fang, Eisen, Mittleman, & Christiani, 2016
Eye strain	Hsu, Sun, Chuang, Juang, & Chang, 2008; Jafari & Dehghani, 2016
Fatigue	Hsu et al., 2008
Hand-arm vibration syndrome	Sauni, Toivio, Esko, Pääkkönen, & Uitti, 2015
Hearing disability syndrome	House, Sauvé, & Jiang, 2010
Insomnia and depression	Hu, Liang, Hu, Long, & Ge, 2013
Occupational lung cancer	Lacourt, Pintos, Lavoué, Richardson, & Siemiatycki, 2015
Respiratory problems	Baker, Dagg, & Greene, 1985
Sick building syndrome	Jafari & Dehghani, 2016
Skin cancer	Stocks et al., 2011
Stress	Leung, Liang, & Yu, 2016
Sunburn	Serrano, Cañada, & Moreno, 2013
Work-related musculoskeletal disorder	Boschman, Molen, Sluiter, & Frings-Dresen, 2012

3. METHODOLOGY

A questionnaire survey was conducted to gather information on the health conditions of the construction workers working in the construction environment in Malaysia. This study investigated whether they had experienced the health problems raised. The questionnaire was prepared based on the objective to determine the health problems that affect the construction workers in their working environment at all levels of work. Construction workers encompassed many levels of work organizations, including top, middle and lower organization. Top organization comprised directors, project managers and manager assistants. Middle organization comprised project consultants, assistant project consultants, engineers, architects and contractors. Lastly, lower organization in construction work level comprised general labors and unskilled labors.

The types of questions asked in the survey were categorical questions. The questionnaire was divided into two main parts; part 1 on background of the respondents, and part 2 on current health conditions of the respondents when working on construction projects. The questions were close-ended questions as they were much more efficient for data collection, processing and analysis (Bourque, et al., 2003) and sentences used were simple and short to improve response rates (Dillman, 2000) especially when general labors and unskilled labors were involved. The questionnaire was also found to have reasonable internal consistency reliability with scores of above 0.70 after assessment using Cronbach's alpha coefficient (Nunnally & Bernstein, 1994).

A total of 500 online surveys were randomly sent to G1 until G7 construction companies in the whole of Malaysia. However, in a period of the survey (2 months), only 53 responses were received. Another 500 self-administered and postal questionnaire surveys were then distributed to construction firms and their site offices located in Kuala Lumpur, Johor and Penang (3 prominent states in West Malaysia). A total of 282 responses were subsequently received, giving a total of 335 respondents. Therefore, this makes up a response rate of 33.5% (see Table 2). According to Sekaran and Bougie (2010), response rate of 30% is deemed acceptable for further analysis.

Table 2: Response rate of the questionnaires

Response	**Frequency/Rate**
Number of distributed questionnaires	1000
Returned questionnaires	335
Response rate	33.5%

4. RESULTS

Demographic information collected during the survey (n=335) (refer Table 3) showed that majority of respondents were female (60.6%). Respondents' age younger than 20 years (0.3%), 20 to 29 years (39.1%), 30 to 39 years (14.5%), 40 to 49 years (15.5%), and older than 49 years (30.6%). Employees described their positions and responsibilities as managerial–executive (most time based in offices) (78.8%), supervisor on site (14.0%), support staff on site (3.0%), and blue-collared labour (interviewed at site) (4.2%). Most of the respondents worked for 10 to 19 years in the construction industry (43.9%), followed by less than 5 years (36.1%), between 5 to 9 years (12.7%), between 20 to 29 years (6.7%), and lastly more than 29 years (0.6%). Overall, 96.4% of employees reported good and excellent health condition with others having their health under certain medication.

Table 3: Respondents' Profile

Respondents Profile	**Frequency (*n*=335)**	**Percent**
Gender		
Male	203	39.4
Female	132	60.6
Age		
< 20	1	0.3
20-29	131	39.1
30-39	49	14.5
40-49	52	15.5
> 49	103	30.6
Occupation (Position)		

Managerial-executive	264	78.8
Supervisor on site	47	14.0
Support staff on site	10	3.0
Blue-collared labour	14	4.2
Working Experience		
< 5 years	121	36.1
5 - 9 years	43	12.7
10 - 19 years	147	43.9
20 - 29 years	22	6.7
> 29 years	2	0.6
Health Condition		
Good and Excellent	323	96.4
Under Medication	12	6.7

This paper describes the health problems occurring among the construction workers based on percentage; below 10% as minor cases (less than 3% is classified as very minor), 10% to 20% as moderate cases, and lastly more than 20% as major or top cases (refer Table 4).

Table 4: Classification of health problems

Percentage	Classification
< 3%	Very minor case
< 10%	Minor case
10 - 20%	Moderate case
> 30%	Major case

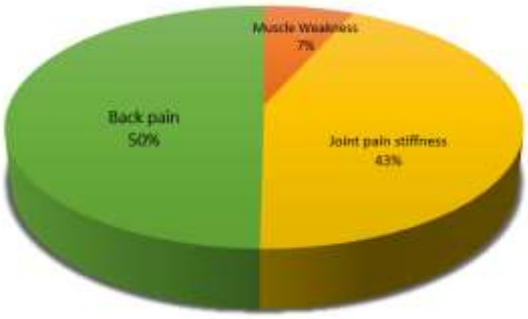

Figure 1: Percentage distribution of MSDs

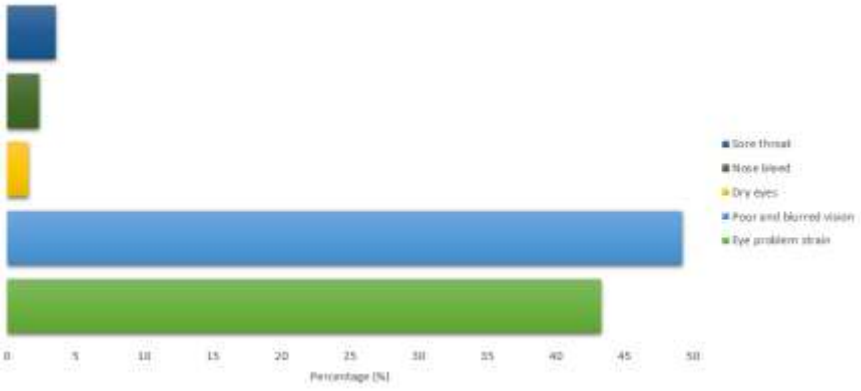

Figure 2: Percentage distribution of ENT disease

One of the major health diseases found is musculoskeletal disorders (MSDs) (see Figure 1) that can affect anyone due to unbalanced lifestyle and working habits. For example, when a worker is doing desk job every day for a long period of time, he is likely to suffer back pain. MSDs are common found to be affecting construction workers as well. MSDs topped the list where there were 127 respondents suffered back pain, 111 had joint pain stiffness, and only 17 respondents had muscle weakness; making a total of 255 (76.1%) MSD patients. A total of 254 (75.8%) respondents recorded to suffer eye, nose and throat (ENT) diseases with majority suffering eye problem like eye strain (n=110), poor or blurred vision (n=125), and dry eyes (n=4). Other ENT problems suffered by respondents were nose bleeds (n=6) and sore throats (n=9) (refer Figure 2). Another two top common diseases were fatigue (n=169; 50.4%) and headaches (n=134; 40.0%).

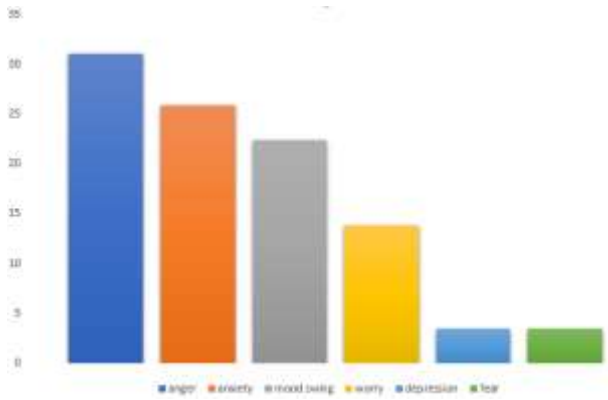

Figure 3: Percentage distribution of Emotions

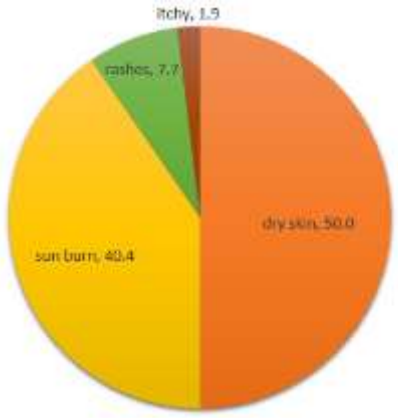

Figure 4: Percentage distribution of Skin/Dermatology

Emotions (n=58; 17.3%) and skin/dermatology (n=52; 15.5%) were also moderately common among construction workers. Six kinds of emotion problems were surveyed. Among the 58 who suffered emotional problems, 18 had anger issues, 15 had anxiety, 13 had mood swings, 8 had ongoing worry, and lastly 2 each had depression and fear (see Figure 3). There were four types of skin problems surveyed. Among the 52 respondents, 26 reported to suffer from dry skin, 21 sunburn, 4 rashes, and 1 itchy skin (see Figure 4).

In this study, there were 14 out of 20 diseases surveyed that fell under the category of minor cases with less than 10% of occurrence. There were 25 (7.5%) female construction workers suffered female problems like cramps or backache (n=15), pre-menstrual emotions (n=8), and painful menstrual periods (n=2). This was followed by poor memory (n=23; 6.9%), decreased motivation (n=19; 5.7%), and insomnia (n=16; 4.8%). There were 14 (4.2%) cases of cardiovascular diseases occurring among construction workers where 6 had high blood pressure, 3 each had low blood pressure and chest pain or pressure, and 2 had irregular heartbeat. Hand Arm Vibration (HAV) occurred among 13 (3.9%) respondents; majority suffered from numbness of fingers (n=10) and others suffered difficulty to pick very small objects (n=3). Only 12 (3.6%) construction-related employees experienced abnormal sweating. Noise-induced hearing loss (NIHL) risks any construction workers who are constantly working on construction site. NIHL problems include ringing in the ears, poor hearing, need to repeat multiple times and need to turn audio volume high. In total, there were 11 (3.3%) respondents suffered NIHL with 2 had ringing in ears, 2 had poor hearing, 6 needed repeated instructions during work, and 1 needed high audio volume.

There were 6 out of the said 14 minor diseases that fell under the very minor category of less than 3% of occurrence. A total of 9 (2.7%) respondents were recorded to suffer from Sick Building Syndrome (SBS). SBS includes several symptoms, when one is in a certain building, such as feeling dizzy (n=7), feeling nausea (n=1), and being sensitive to odors and sights (n=1). Respiratory problems are health diseases that can occur from exposure to harmful particles at construction sites. Even though construction sites expose workers to dust, surprisingly, only 8 (2.4%) respondents claimed to have respiratory problems like cough (n=6), asthma (n=1), and difficult breathing (n=1). There were 7 (2.1%) respondents who suffered from gastrointestinal problems with 5 having gastrointestinal-related nausea and 2 having poor appetite. The last three diseases occurring among construction workers were difficulty to focus (n=6; 1.8%), tendency to faint (n=2; 0.6%), and difficulty to walk or move for long hours (n=1; 0.3%).

Table 5 shows ranking and frequency of the diseases occurred among construction workers.

Table 5: Frequency distribution of diseases and their classifications

Diseases	Frequency		Percentage (%)	Classifications	Rank
	Yes	No			
Musculoskeletal disorders (MSDs)	255	80	76.1	Major case	1
Eyes, nose and throat (ENT)	254	81	75.8	Major case	2
Fatigue	169	166	50.4	Major case	3
Headaches	134	201	40.0	Major case	4
Emotions	58	277	17.3	Moderate case	5
Skin/Dermatology	52	283	15.5	Moderate case	6
Female problems	25	310	7.5	Minor case	7
Poor memory	23	312	6.9	Minor case	8
Decreased motivation	19	316	5.7	Minor case	9
Insomnia	16	319	4.8	Minor case	10
Cardiovascular	14	321	4.2	Minor case	11
Hand arm vibration (HAV)	13	322	3.9	Minor case	12
Abnormal sweating	12	323	3.6	Minor case	13
Noise-induced hearing loss (NIHL)	11	324	3.3	Minor case	14
Sick Building Syndrome (SBS)	9	326	2.7	Very minor case	15
Respiratory problem	8	327	2.4	Very minor case	16
Gastrointestinal	7	328	2.1	Very minor case	17
Difficulty to focus	6	329	1.8	Very minor case	18
Tendency to faint	2	333	0.6	Very minor case	19
Difficulty to walk or move in long hours	1	334	0.3	Very minor case	20

5. DISCUSSION

This study concentrated on finding out whether all levels of construction workers were facing work-related health problems. The major health problems, where more than 70% of the respondents encountered, were musculoskeletal disorders and eyes, nose and throat diseases. These were followed by fatigue (50.4%) and headache (40.0%). These implied that majority of the construction workers were overworked and mostly deprived of rests. The findings concurred with major findings of related studies where higher chances of work accidents may occur as the workers suffered MSDs, fatigue and headache. ENT diseases could be highly interrelated with these major cases as immune systems were down. Two health problems were in the moderate case category, they were emotional disease (17.3%) and skin or dermatology (15.5%) disease. These suggested that construction workers were prone to emotional diseases and skin problems when working in construction-related environment. Root causes to all these pollutions should be further determined to reduce the occurrence. All the other health problems surveyed had less than 10% of occurrence, they were health problems such as sick building syndrome, respiratory, gastrointestinal, difficulty to focus, tendency to faint, and difficulty to walk or move in long hours.

There were only a total of 21.2% of site-based construction workers responded to this survey with only 4.2% coming from the blue-collared labour. This was the limitation of this study where the respondents were largely office-based. The low response rate from the site-based construction workers could have undermined the criticality of some of the health problems. For instance, hand arm vibration and noise-induced hearing loss affected were affecting the blue-collared labour interviewed. Their job nature involves intensive and repetitive actions like

hammering, drilling, welding and the like. The exposures to noise, debris, particles and continuous fixed position when operating construction tools are what that have contributed to the health problems like HAV and NIHL.

These findings captured a clearer preliminary understanding on the health problems affecting Malaysian construction workers. The data is useful for further investigation on the health problem itself and solutions to provide a better safety measures for prevention. These can lessen the work-day loss and eventually economic loss.

6. CONCLUSION

The aim accomplished in this research study was to obtain the figures of the highest and the lowest health problem occurrences among construction workers working in construction environment in Malaysia. The top health problems that construction workers were facing were musculoskeletal disorders and ear, nose and throat diseases. With over 70% of occurrence among construction workers, these were the pressing health issues that employers should be concerned of in order to lower the probabilities of compromised safety at work. Construction industry has a dirty, difficult and dangerous working environment. Labour, especially the blue-collared, is prone to accidents if they are allowed to work even when they are not feeling well. Any health check procedure for construction workers implemented by employers can be relooked for the many benefits like timely project delivery, positive health and safety reputation, and low work-day loss. The authors hope to further study on the pressing health issues related to both office-based and site-based construction workers with more respondents from site-based workers. It is also worthwhile to investigate the cost and benefit of construction workers' health problems and treatments provided associated to construction projects.

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