

# Occupational Safety and Health (OSH) Concept Towards Project Performance

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## ABSTRACT

*Construction industry is one of the highest incidences after manufacturing industry and also the third biggest contributor to accident cases in Malaysia which making the industry deemed unsafe. The purpose of this research is to identify the causes and effect of construction accident and the impact of occupational safety and health (OSH) concept to project performance. This research is using questionnaire survey method of data collection to 72 respondents from G7 contractors which presenting 75 percent of response rate that involved in the construction of high rise building in Selangor. From the survey, finding shows major factors of construction accident consist of eleven (11) factors that been divided into four (4) main factors (i.e. Human; Worksite; Organization and Management; and External). Moreover, effect of construction accident includes loss ability to work lead to decrease and loss of individual/family income and standard of living, work disruption, delay of work progress, loss of time in project execution, need extra health and safety compliance work, company reputation and image, damages of plant and equipment, property and asset, increase of fine and legal expenses, and loss of productivity. Furthermore, most of the respondents also strongly agree with all statement impact of occupational safety and health (OSH) concept to project performance which include increase workers productivity, reduce rate of construction accident and injuries, increase safety at construction site, improve efficiency, human relations, increase profit, company reputation, business performance, reducing of penalties, insurance premiums and employment costs, quality of product, job satisfaction, morale of the workers, costs saving, and enhancement of project performance. The finding results of this research may contribute in reducing the number of accidents at workplace and assist in designing effective solutions of construction accident.*

**Keywords:** *Construction accident; Occupational Safety and Health Concept; Project performance*

## INTRODUCTION

Construction industry is a most hazardous industry. According to Construction Industry Development Board (2019), construction industry is one of the highest incidences after manufacturing which making the industry deemed unsafe. Occupational accidents in the construction industry are frequent, and may lead to permanent disabilities and a high rate of fatalities (Nadhim, Hon, Xia, Stewart, & Fang, 2016). Therefore, due to high number of construction accidents and the consequences of this has for workers, organization, society and countries, occupational safety and health (OSH) has become a very important issues for all stakeholders (Suarez, Carvajal, & Alis, 2017). According to Muttalib (2016), there are 420 workers were involved in construction accidents between 2011 and October 2016; whereby from January to October 2016, 55 workers were killed and 95 others were injured. Construction site is defined as any site at which any of the processes or operations of a construction are carried on (Dias, 2009).

According to Dias (2009), there are enough laws and regulations on OSH in construction industry around the world, however there is a failure to implement these laws and regulations.

There are many factors contributed to construction accident which include human factor, worksite factor, organization and management factor, and also external factor (Jaafar et al., 2018). However, Promsorn, Soponsakulrat, Adulyanukosol, and Kaiyarit (2015) state that factor contribute to construction accident were inappropriate ergonomic design environment and supporting policy. Construction accident undoubtedly will affect the performance of construction project. In addition, unsafe acts and unsafe condition are also one of the factors that may contribute to construction accident (Abdelhamid & Everett, 2000).

The effects of construction accident can be divided into two which are economic impact and social impact (Mthalande, Othman, & Pearl, 2008). Moreover, Heather Cormack, Steve Cross, and Claire Whittington (2006) proved that construction accidents will also affect psychological and behavioural of the workers. Besides that, accident that happened at construction site will cause the delay in construction progress and completion which related to time factor in project performance (Nguyen, An, & Nguyen, 2014).

Furthermore, construction accident will also give an impact to project performance in term of indirect costs of workplace to the employer and employees due to increases of expenses that affect financial of project performance (Head & Harcourt, 2015). This is also supported by Ling (2014) where the safe and healthy workplace is important to protect workers and increase productivity. Therefore, when occupational safety and health (OSH) culture increase, the workplace injuries and accident can be reduced hence improve efficiency, productivity and business performance of the company (Ismail Abdul Muttalib, 2014). Thus, it is noteworthy to identify the cause and effect of accident on construction project and the impact of OSH concept to project performance.

## LITERATURE REVIEW

### Contributing factors to OSH accidents in construction industry

According to Jaafar et al. (2018), contributing factors to OSH accidents in construction industry can be divided into four main factors which consist of human factor, worksite factor, organization and management factor, and external factors as shows in Table 1.

Human factor that contribute to construction accident can be comprise in 4 element which are physical, experience, attitude and behaviour (Jaafar et al., 2018). Human factor includes the individual characteristics of the construction workers including their demography, level of knowledge, human behaviour and attitudes, physical characteristic and health condition of the workers (Nadhim *et al.*, 2016). Besides that, Hong & Gui (2017) found that careless and unsafe acts among the workers in doing their work (Kadiri *et al.*, 2014; Yusof, 2019), insufficient training on workers, lack of safety awareness (Goh *et al.*, 2016) and improper use of protection equipment (Kadiri *et al.*, 2014; Orji Solomon et al., 2016) were identified to contribution of nearly 80% of the construction accident.

Table 1: Contributing factors to OSH accidents in construction industry

<b>Contributing factors to OSH accidents in construction industry</b>	<b>Author</b>
Human Factor	(Abdelhamid & Everett, 2000; Chim, Chun, & Wah, 2018; Goh, Goh, Omar, Toh, & Mohd Zin, 2016; Hong & Gui, 2017; Jaafar et al., 2018; Kadiri et al., 2014; Kilani, 2011; Nadhim et al., 2016; Orji Solomon, Enebe Eucharia, & Onoh Felix, 2016)
Worksite Factor	(Charehzezi & Ahankoob, 2012; Chim et al., 2018; Goh et al., 2016; Jaafar et al., 2018; Mutallib, 2014; Nadhim et al., 2016; Promsorn et al., 2015; Rahim, Hamid, & Singh, 2008)
Organization and Management Factor	(Abdelhamid & Everett, 2000; Chim et al., 2018; Jaafar et al., 2018; Kadiri et al., 2014; Mutallib, 2014; Nadhim et al., 2016; Orji Solomon et al., 2016; Yilmaz, 2015; Yilmaz & Alp, 2016)
External Factor	(Chim et al., 2018; Jaafar et al., 2018)

Worksite factor includes poor design and selection (Charehzezi & Ahankoob, 2012; Chim *et al.*, 2018). It is because accident could occur when there are defects in the work surface such as unprotected walkway, improper guardrails, slippery or sloped surfaces (Nadhim *et al.*, 2016). However Promsorn *et al.* (2015) stated that root cause of construction accident can be divided into three factors which are Ergonomic design (i.e. light, noise and vibration) (Charehzezi & Ahankoob, 2012); Supporting policy (i.e. training and technology); and Environment (i.e. weather and sunlight). In addition, worksite factor may also consist of jobsite conditions (Charehzezi & Ahankoob, 2012), poor site management (Charehzezi & Ahankoob, 2012; Goh et al., 2016; Jaafar et al., 2018; Mutallib, 2014; Rahim *et al.*, 2008), equipment and material (Charehzezi & Ahankoob, 2012) and construction task (Charehzezi & Ahankoob, 2012; Jaafar *et al.*, 2018).

Organization and management factor include policy (Charehzezi & Ahankoob, 2012), resource management, management culture and safety management which play a significant role in contribute to accidents in the construction industry (Jaafar *et al.*, 2018). Besides that, organization and management factor include negligence of contractor (Chim *et al.*, 2018), failure to enforce safety measures (Chim *et al.*, 2018), inadequate coordination, communication and supervision (Chim *et al.*, 2018; Kadiri *et al.*, 2014; Mutallib, 2014). Furthermore, companies might have improper safety measures/standard (Charehzezi & Ahankoob, 2012) such as insufficient/inoperative personal protective equipment (PPE) (Nadhim *et al.*, 2016; Yilmaz, 2015), defective safety belt/harness and lack of training courses (Goh *et al.*, 2016; Mutallib, 2014; Nadhim et al., 2016; Orji Solomon *et al.*, 2016) which may also contribute to construction accidents. Moreover, management procedure should be designed to identify and remove unsafe conditions in a proactive manner, and should always enforce the value and important of safety among workers (Abdelhamid & Everett, 2000).

According to Jaafar *et al.* (2018), external factor could be categorized as higher level that cause of occupational accidents and illnesses which are difficult to be identified through accident investigation that can be separated into three comprising of politics and legislation, economy, and also social aspects. Besides, previous research Chim *et al.* (2018) found that external factor include failure to comply with occupational safety and health act (OSHA).

## Effect of Construction Accidents

Effect of construction accidents can be divided into three categories which include individual effect, company/business effect and project effect. Table 2 present a finding that found by previous researcher on the ten (10) individual effect of construction accidents. According to Chim *et al.* (2018), high accident risk results in workers' loss of confidence and low productivity. Besides that, construction accident is not only affect the victims but also may affect their family such as decrease family income (Head & Harcourt, 2015; Mthalane *et al.*, 2008; Pezzullo & Crook, 2006), decrease standard of living (Mthalane *et al.*, 2008), increase debt (Mthalane *et al.*, 2008) and difficulty in pay bill or policies bond (Head & Harcourt, 2015; Pezzullo & Crook, 2006; Thye, 2012).

Table 2: Individual effect of construction accidents

Individual effect of construction accidents	Author
Decrease family income	(Asanka & Ranasinghe, 2015; Head & Harcourt, 2015; Mthalane <i>et al.</i> , 2008; Pezzullo & Crook, 2006)
Decrease standard of living	(Mthalane <i>et al.</i> , 2008)
Increase debt	(Mthalane <i>et al.</i> , 2008)
Medical payment/expenses	(Arunkumar & Gunasekaran, 2018; Asanka & Ranasinghe, 2015; Head & Harcourt, 2015; Pezzullo & Crook, 2006; Thye, 2012)
Family depression	(Mthalane <i>et al.</i> , 2008)
Loss of social welfare	(Mthalane <i>et al.</i> , 2008)
Loss quality of life	(Head & Harcourt, 2015; Mthalane <i>et al.</i> , 2008; Pezzullo & Crook, 2006)
Loss of income	(Asanka & Ranasinghe, 2015; Head & Harcourt, 2015; Pezzullo & Crook, 2006)
Loss of confidence and low productivity	(Arunkumar & Gunasekaran, 2018; Chim <i>et al.</i> , 2018)
Loss quality of life	(Mthalane <i>et al.</i> , 2008)

Furthermore, Table 3 present on the 15 of company/business effect due to construction accident that being specified by previous researchers. According to Chim *et al.* (2018),effect of construction accident to company/business include increase company expenses and financial losses due to property damages and removing cost, compensation and penalties from authorities (Rahim *et al.*, 2008).Besides that, construction company which synonymous with high accident tendency have a bad reputations in creating dissatisfaction among stakeholder and consequently become unattractive in their tendering (Chim *et al.*, 2018). This is also found by (Udo, Usip, and Asuquo (2016) which stated that accident happened on site may affect overall project cost, productivity and reputation of company. Furthermore, Sarkam *et al* (2018) stated that the outcomes of failing to meet deadlines are often severe and difficult to solve, causing losses for the client and worsening safety condition at the construction site. Besides, high number of construction accidents may bring economic slowdown (Chim *et al.*, 2018).

Table 4 presents five project effect of construction accident since the accident happened at construction site which include loss of time in project execution, delay of work progress, work disruption, loss of customer satisfaction and absenteeism among the workers. Minor and major accident happened will cause the workday losses to the project due to the investigation that need to be conducted by responsible parties (Yilmaz, 2015). Therefore, delay in completion may cause of cost overrun and loss of profit due to liquidate and ascertained damages and other expenditure incurred due to accident happened (Asanka & Ranasinghe, 2015; Chim *et al.*, 2018). Moreover, the effect of accident that cause absenteeism of workers(Durdyev, Omarov, & Ismail, 2017; Pezzullo & Crook, 2006) will lead to delay on construction work progress (Kilani, 2011; Nguyen *et al.*, 2014; Udo *et al.*, 2016) which cause of low performance of workers and consequently affect total duration of the project (Durdyev *et al.*, 2017).In addition, construction accidents happen on site may demotivate workers, disrupt site activities, and delay project progress (Udo *et al.*, 2016).

Table 3: Company/Business Effect of construction accidents

<b>Company/Business Effect of construction accidents</b>	<b>Author</b>
Company reputation	(Arunkumar & Gunasekaran, 2018; Chim <i>et al.</i> , 2018; Pezzullo & Crook, 2006; Udo <i>et al.</i> , 2016)
Extra OSH compliance work	(Adams <i>et al.</i> , 2002; Arunkumar & Gunasekaran, 2018)
Loss of business	(Adams <i>et al.</i> , 2002; Mthalande <i>et al.</i> , 2008)
Increase expenses	(Adams <i>et al.</i> , 2002; Arunkumar & Gunasekaran, 2018; Chim <i>et al.</i> , 2018; Head & Harcourt, 2015; Pezzullo & Crook, 2006)
Fines and legal expenses	(Asanka & Ranasinghe, 2015; Head & Harcourt, 2015; Mthalande <i>et al.</i> , 2008; Rahim <i>et al.</i> , 2008)
Increase insurance cost	(Asanka & Ranasinghe, 2015; Mthalande <i>et al.</i> , 2008; Pezzullo & Crook, 2006)
Depression of employees	(Mthalande <i>et al.</i> , 2008)
Damages of plant and equipment, property and asset	(Adams <i>et al.</i> , 2002; Asanka & Ranasinghe, 2015; Charehzechi & Ahankoob, 2012; Kilani, 2011; Mthalande <i>et al.</i> , 2008; Pezzullo & Crook, 2006; Rahim <i>et al.</i> , 2008)
Legal penalties	(Adams <i>et al.</i> , 2002; Asanka & Ranasinghe, 2015; Chim <i>et al.</i> , 2018; Mthalande <i>et al.</i> , 2008; Rahim <i>et al.</i> , 2008)
Investigation cost increase	(Asanka & Ranasinghe, 2015; Pezzullo & Crook, 2006; Yacob, Saruwono, & Ismail, 2017)
Decrease of productivity	(Chim <i>et al.</i> , 2018; Head & Harcourt, 2015; Kilani, 2011; Thye, 2012)
Loss of production	(Adams <i>et al.</i> , 2002; Charehzechi & Ahankoob, 2012; Kilani, 2011; Mthalande <i>et al.</i> , 2008)
Decrease worker morale	(Adams <i>et al.</i> , 2002; Charehzechi & Ahankoob, 2012; Chim <i>et al.</i> , 2018; Kilani, 2011; Mthalande <i>et al.</i> , 2008; Thye, 2012; Udo <i>et al.</i> , 2016)
Decrease work quality	(Thye, 2012)
Dissatisfaction among stakeholders	(Chim <i>et al.</i> , 2018)

Table 4: Project effect of construction accidents

<b>Project effect of construction accidents</b>	<b>Author</b>
Loss of time in project execution	(Arunkumar & Gunasekaran, 2018; Asanka & Ranasinghe, 2015; Chim <i>et al.</i> , 2018; Durdyev <i>et al.</i> , 2017; Udo <i>et al.</i> , 2016)
Delay of work progress	(Asanka & Ranasinghe, 2015; Chim <i>et al.</i> , 2018; Durdyev <i>et al.</i> , 2017; Mthalande <i>et al.</i> , 2008)
Work disruption	(Kilani, 2011; Mthalande <i>et al.</i> , 2008; Udo <i>et al.</i> , 2016)
Loss of customer satisfaction	(Mthalande <i>et al.</i> , 2008)
Absenteeism	(Durdyev <i>et al.</i> , 2017; Pezzullo & Crook, 2006; Udo <i>et al.</i> , 2016)

## **Impact of Occupational Safety and Health (OSH) Concept to Project Performance**

Safe and healthy workplace environment are important to protect employees and increase productivity (Ling, 2014). According to Thye (2015), development of string safety and health cultures at the workplace will have a greater impact on reduction of construction accident. Productivity was being measured by evaluating the production due to unfavourable working environment and delay occasioned by unclear safety and health guidelines (Getanda, 2015). Occupational safety and health concept include laws, regulations, standards, guidelines, specifications and other documents (Dias, 2009). According to Berman (2015), project performance can be measured by producing an effective result which result in productivity, avoidance of waste (Thye, 2016) in fraud which can helped in cost reduction; and by professional outlook of managers and their employees in the intrinsic satisfaction which interrelated to job satisfaction. In addition, Han, Saba, Lee, Mohamed and Pena-Mora (2014) stated that a successful construction project must meet performances and delivery requirement for time, cost, quality and safety.

Poor workplace health and safety will cause of increasing penalties from prosecutions for breaches of workplace safety and health laws, increase insurance premiums, and increase employment cost (Heaney & Irlicht, 2010). Furthermore, lower turnover, reduce absenteeism and high productivity hereafter increase company profit will be achieved by having an effective OSH programme and development of OSH teams (Zakaria, 2012). Ergonomic program in safety and health can helped in reducing construction accident and injuries besides increase productivity and efficiency of work, quality of product and also morale of the workers (Thye, 2012). Besides that, ergonomic implementation in workplace health and safety is necessary for the improvement of productivity and efficiency in order to increase the reputation of company (Peter Gahan & Evans, 2014).

### **METHODOLOGY**

This research aims to identify the effect of accident and the impact of Occupational Safety and Health (OSH) concept to project performance. There are two types of method that been used in completing this study which are primary data and secondary data. The primary data of this research utilised quantitative method of data collection by means of questionnaire survey to 72 respondents from G7 contractors which presenting 75 percent of response rate that involved in the construction of high rise building in Daerah Petaling, Selangor. Selangor has been selected as a sample of this research due to the highest number of workplace fatal accident and the highest number of notices being issues by DOSH to the workplace/ plant/ substance/ process that may pose an immediate danger in Selangor state. In addition, this research was using Statistical Package for the Social Science (SPSS) software for statistical method analysis of questionnaire survey that include Descriptive method and Likert rating scale of data analysis. Besides that, the secondary data been collected by document analysis from Department of Occupational Safety and Health (DOSH) and reading material such as journal, books, articles, newspaper and others in order to enhance and consolidate knowledge base and helps to integrate the research finding with the existing body of knowledge besides being used to integrate the research finding to either support or contradict the previous research.

### **RESULT AND DISCUSSIONS**

Table 5 and Table 6 illustrates the respondent's job designation and respondent's years of experiences for questionnaire survey. In overall of questionnaire survey that involving 72 respondent, 59.7 percent of the respondent are from executive level such as Project Manager, Site Engineer, Health and Safety Officer and others (i.e., Architect Coordinator, Safety Coordinator and Quantity Surveyor). Furthermore, from the Table 6, it can be determined that there are 43 percent of respondent have more than 5 years of experiences in construction of high-rise building. Therefore, it is shows that the data collected are qualified as the respondent are the person that involved directly at the construction site and provide a good spread of personal experience in the sample.

Table 5: Respondent's Job Designation

<b>Job Designation</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Project Manager	9	12.5
Site Engineer	17	23.6
Health and Safety Officer	12	16.7
Site Supervisor	15	20.8
Safety Site Supervisor	14	19.4
Others	5	6.9
Total	72	100.0

Table 6: Respondent's Years of Experiences

<b>Years of Experiences in High-rise Construction</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Less than 1 year	15	20.8
2-5 years	26	36.1
6-10 years	16	22.2
11-15 years	7	9.7
More than 15 years	8	11.1
Total	72	100.0

## Factor Contribute to Accident on Construction Project

From the survey result, it can be determined that there are four factors contribute to accident on construction project including human factor, worksite factor, organization and management factor and external factor. However, Table 7 shows there are 48 respondents (66.7%) point out that human factor is the most contributing factor that may lead to the accident on construction project. This is in line with the previous research conducted by (Goh *et al.*, 2016; Heather Cormack *et al.*, 2006; Hong & Gui, 2017; Kadiri *et al.*, 2014; Orji Solomon *et al.*, 2016; Soltanzadeh, Mohammadfam, Moghimbeigi, & Akbarzadeh, 2016; Yusof, 2019).

Table 7: Main factor contribute to accident

<b>Main factor contributes to accident</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Human Factor	48	66.7
Worksite Factor	17	23.6
Organization and Management Factor	5	6.9
External Factor	2	2.8
Total	72	100.0

Table 8 shows result analysis of four factors that contribute to accident happened at construction project. Human factor consists of careless among the workers (65.3%), improper use of PPE (59.7%), unsafe acts (55.6%), and lack of safety awareness (51.4%).

Table 8: Factor contribute to accident on construction project

<b>Factor contribute to accident on construction project</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Human Factor</b>		
Careless among the workers	47	65.3
Improper use of PPE	43	59.7
Unsafe acts	40	55.6
Lack of safety awareness	37	51.4
<b>Worksite Factor</b>		
Unsafe condition	46	63.9
Unsafe actions	46	63.9
Poor safety practice	40	55.6
Unsuitable tools and equipment	36	50.0
<b>Organization and Management Factor</b>		
Lack of knowledge/incompetency	47	65.3
Lack of supervision / monitoring	40	55.6
<b>External Factor</b>		
Regulatory	44	61.1

Moreover, worksite factor that contribute to construction accident as agreed by respondent consist of unsafe condition (63.9%), unsafe actions (63.9%), poor safety practice (55.6%) and unsuitable tools and equipment (50.0%). Similar high response percentage of unsafe condition and unsafe actions has demonstrated that these two factor are the major worksite factor to construction accident. This result is similar with the previous research finding conducted by Irumba and Wilhelmsson (2014); Rahop (2016); Thye (2016); and Yilmaz and Alp (2016). Furthermore, based on organization and management factor, lack of knowledge/incompetency (65.3%) and lack of supervision / monitoring (55.6%) may be factor that contribute to construction accident. This survey results also similar with previous research done by Irumba and Wilhelmsson (2014); Mutallib (2014); Thye (2016); and Yilmaz and Alp (2016) who found that lack skill and experiences among construction workers is the most factor that may lead to the construction accident. Lastly there are 44 respondents (61.1%) indicated that regulatory is the most external factor that usually may contribute to accident at construction site. This result also supported by the research done by Zahoor, Chan, Gao, & Utama (2017) which found that major reason for non-adherence are include non-enforcement of existence regulatory.

## Effect of Accident on Construction Project

Table 9 present three effects of accidents on construction project that clarified by all of the 72 respondents which include individual effect, project effect, and organization/business effect. The survey result shows that the respondents are strongly agree with individual effect of construction accident that cause of loss ability to work which may lead to decrease and loss of individual/family income and standard of living ( $M=4.19$ ). This result is similar with the research done by Head and Harcourt (2015) and Pezzullo and Crook (2006) which found that the economic effect of site accident may affect the individual and family that consists of decrease family income and decrease standard of living. Additionally, Mthlane, Othman, and Pearl (2008) previous research also found that the decrease in standard of living is ranked the highest economic effect on the affected families and construction companies respectively that cause by site accidents with mean of 4.6 and follow by decrease in family income in second rank with mean score of 4.



Table 9: Effect of accident on construction project

Effect of accident on construction project	Mean
<b>Individual Effect</b>	
Loss ability to work lead to decrease and loss of individual/family income and standard of living	4.19
<b>Project Effect</b>	
Work disruption	4.22
Delay of work progress	4.21
Loss of time in project execution	4.21
<b>Organizational /Business Effect</b>	
Need extra health and safety compliance work	4.26
Effect company reputation	4.24
Damages of plant & equipment, property and asset	4.19
Increase of fine & legal expenses	4.01
Decrease and loss of productivity	4.00

Furthermore, result shows that the project effects of accidents on construction project include work disruption (M=4.22), delay of work progress (M=4.21) and loss of time in project execution (M=4.21). This result is similar with previous research by Durdyev, Omarov, and Ismail (2017); Kadiri et al. (2014); Kilani (2011); Mthlane et al. (2008); Nguyen, An, and Nguyen (2014); Peter Gahan and Evans (2014); and Yilmaz (2015). Besides that, construction accident also will effect organization and business of the company such as the need for extra health and safety compliance work (M=4.26), company reputation (M=4.24), damages of plan and equipment, property and asset (M=4.19), increase of fine and legal expenses and decrease (M=4.01) and loss of worker's productivity (M=4.00).

## Impact of Occupational Safety and Health (OSH) Concept to Project Performance

Table 10 shows the impact of occupational safety and health (OSH) concept to project performance. This survey result shows that the most of the respondent are strongly agree with the impact of occupational safety and health (OSH) concept to the performance of construction project. This finding includes safety and health workplace important in order to increase productivity (M=4.47) and low accident happened will indicate to the high productivity of the workers (M=4.39). This is similar with the findings of previous research by Ling (2014); and Thye (2016).

Besides that, the finding also found that Poor site condition affects labour productivity at construction site (M=4.38), therefore the respondent also agreed that health and safety factor may affect the performance of construction project (M=4.28) which similar as stated by Thye (2016). The result also shows that respondents are strongly agreed with the statement of construction accidents has a relationship with project performance (M=4.26) which is supported by previous researches conducted by Asanka & Ranasinghe (2015); and Han, Saba, Lee, Mohamed, and Pena-Mora (2014). Additionally, this result also found a similar findings with Zakaria (2012) in term of when the OSH culture and programmed increases, the workplace injuries can be reduce as well as improve the efficiency, productivity, profit and business performance (M=4.25).

Table 10: Impact of occupational safety and health (OSH) concept to project performance

<b>Impact of occupational safety and health (OSH) concept to project performance</b>	<b>Mean</b>
Safety and health workplace important in order to increase productivity	4.47
Low accident happened will indicate to the high productivity of the workers	4.39
Poor site condition affects labour productivity at construction site	4.38
Health and Safety factor affect performance of construction project	4.28
Construction accident has a relationship with project performance	4.26
When the Occupational Safety and Health (OSH) culture and programmed increases, the workplace injuries can be reduced as well as improve the efficiency, productivity, profit and business performance	4.25
If the workplace health and safety practice improve, it will be held in reducing of penalties, insurance premiums and employment costs.	4.25
Ergonomic program helped in reducing the accident and injuries besides increase of productivity, efficiency of work, quality of product and morale of the workers.	4.22
Poor practice of workplace health and safety drive to the reducing of business potential profit and reputation losses.	4.07

Furthermore, respondents also strongly agreed that if the workplace health and safety practice improve, it will be held in reducing of penalties, insurance premiums and employment costs (M=4.25) which similar to research finding by Choi (2006). Apart from that, ergonomic program also may help in reducing the accident and injuries besides increase of productivity, efficiency of work, quality of product and morale of the workers (M=4.22). These finding results also similar with previous research conducted by Peter Gahan and Evans (2014); and Thye (2012) which found that ergonomic programmes are important to increase productivity, efficiency, quality and morale of the workers. Finally, poor practice of workplace health and safety drive to the reducing of business potential profit and reputation losses also strongly agreed by the respondent (M=4.0) which also supported by Peter Gahan and Evans (2014) that highlight a healthy and safe workplace will initiate to the increase of reputation and profit of the company.

## CONCLUSION

In conclusion this research is based on the findings and analysis that being summarize based on the research objectives. This research study on the factor contribute to construction accident, effect of accident on construction project and the impact of occupational safety and health (OSH) concept to project performance. This research obtains the views of contractors that involved 72 samples of respondent with 75 percent of respond rate for the outcome of project especially in high rise building construction project. Research finding shows the major factors of construction accident consist of careless among the workers, improper use of personal protective equipment (PPE), unsafe acts, lack of safety awareness among workers, unsafe condition, unsafe action, poor safety practice, unsuitable and improper use of tools and equipment, lack of knowledge and incompetency, lack of supervision and monitoring and lack enforcement of safety policy and regulations.

Furthermore, effect of accidents on construction project include loss ability to work lead to decrease and loss of individual/family income and standard of living, work disruption, delay of work

progress, loss of time in project execution, need extra health and safety compliance work, effect on company reputation and image, damages of plant and equipment, property and asset due to accident, increase of fine and legal expenses, and decrease and loss of productivity. In addition, most of the respondents also strongly agree with the statement impact of occupational safety and health (OSH) concept to project performance include increase productivity of the workers, reduce rate of construction accident and injuries, increase safety at construction site, improve the efficiency, human relations, increase profit, company reputation, business performance, reducing of penalties, insurance premiums and employment costs, quality of product, job satisfaction, morale of the workers, costs saving, and facilitated to the enhancement of project performance.

Therefore, the finding result of this research may contribute in reducing the number of accidents at workplace and assist in designing effective solutions of construction accident. However, this study is limited to small sample size due to limitation of time that cause a limited ability to generalize result to the entire construction industry especially in construction of high rise building which highly root to accident in construction industry. Thus, as future development and due to the fact that complexity and extension of construction project are increasing, it is recommended to study more details on the cause of accidents in order to find the best solution for the problem hence improve occupational safety and health on construction project. Besides that, it is also suggested to further research and study more details on the impact of occupational safety and health (OSH) concept to project performance by using the mix of qualitative and quantitative data collection in order to strengthen the validity and rationality of the implication.

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