INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES
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To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v12-i8/14491 DOI:10.6007/IJARBSS/v12-i8/14491

Received: *17* June 2022*,* ***Revised:*** *18* July 2022*,* ***Accepted:*** *28* July 2022

Published Online: *09* August 2022

In-Text Citation: (Ishak et al., 2022)

To Cite this Article: Ishak, N., Mansor, M. I. Bin, Ahmad, A. C., Jaafar, A. S., & Jaffar, N. (2022). Hindrance in Safety Management Practices in The Construction of Infrastructure Projects. *International Journal of Academic Research in Business and Social Sciences*, *12*(8), 798 – 806.

Vol. 12, No. 8, 2022, Pg. 798 – 806

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Hindrance in Safety Management Practices in The Construction of Infrastructure Projects

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Abstract
Safety management is one of the safety frameworks that can be applied in construction industry to mitigate the occurrence of accidents and reducing the fatality rate among construction workers. However, data in 2020 shows that there were 206 cases of reported accidents in the construction industry in Malaysia, from January to December 2020. The increasing number of accidents in infrastructure projects involving construction workers has been around for a long time even though the safety management system had been implemented. Thus, the objective of this research is to determine the hindrance factors in safety management practices in the construction of infrastructure projects. A total of 205 questionnaire surveys were distributed to the safety officers who work at G7 contractor specialise in infrastructure projects in Kuala Lumpur area using a snow-balling data collection method. The result revealed that the tight project schedule, poor participation in the safety management practices and poor safety culture are the significant factors that hinders the safety management practices. While lack of motivation among workers is the least important factor that hinder the safety management practices. Thus it is hoped that by tackling and solving these issues may improve the safety management practices, and indirectly reducing the number of accidents and fatalities on the construction site.
Keywords: Safety Management Practices, Infrastructure Projects, Construction Workers

Introduction

The adoption of safety management in construction project is very important to mitigate error in construction site and improve the quality management for the project (Shamsuddin et al., 2015). This is due to the nature of hazard and high risk of the occurrence of accidents that are the main reason of making the construction industry as one of the main contributors to fatality in workplace as compared to other industries (Yiu et al., 2019). Data in 2020 shows that there were 206 cases of reported accidents in the construction industry in Malaysia, from January to December 2020 (Department Occupational Safety and Health., 2020). Out of that number, 66 cases (32%) involved fatality cases, which make the construction industry to be the second highest contributor for cases involving deaths behind manufacturing industry. One

of the best ways to mitigate the occurrence of accidents in construction industry is by the implementation of safety management practices (Li et al., 2018). However the Malaysian construction company did not fully utilise the management system constructed by the Occupational Safety and Health (Jaafar et al., 2017). The increasing number of accidents in infrastructure projects involving construction workers has been around for a long time even though the safety management system had been implemented (Eltayf et al., 2020). Othman et al (2020) had stated that the implementation of safety in construction become more challenging especially for newly developing country. The safety regulations imposed by the organisation might not be efficient enough compared to the developed countries. Therefore this research is aiming to determine the hindrance factors in the implementation of safety management practices in the construction of infrastructure projects.

Literature Review

The idea on implementing safety in construction project will not materialise without the proper management ethic on safety. Li et al (2018) give a long explanation regarding the differentiation between safety and safety management in construction as explained below.

Safety Management

Safety can be defined as a situation where the unwanted circumstances was prevented such as accidents, injuries, and fatalities (Li et al., 2018). Meanwhile, the definition of safety management is a phase or action taken by the executives in managing the safety to avoid any unwanted situation occurred such as by cultivating safety concepts, safety principles, and safety procedures among construction workers (Jazayeri et al., 2017). The provision of safety management practices in infrastructure project was crucial in securing the safety on site and to improve the safety performance of the project (Zou and Sunindijo, 2015).

Infrastructure Project

The construction sector contributes a lot in economic growth for a nation and provide facilities for the usage of public in running their economic activities and daily lives (Cui et al., 2018). Infrastructure projects consist of construction of roads, bridge, piping system, sewerage system, and electricity (Eltayf et al., 2020). Furthermore, the nature of infrastructure project was it is commonly being executed using joint venture method between public and private sector to ensure the project get a better management and financial. However, this large-scale project was prone to accidents among construction workers (Ayob et al., 2018).

Factors That Hinder the Safety Management Practices in the Construction of Infrastructure Projects

In this research, the objective is to determine the factors that hinders the safety management practices that contribute to the better safety management practices in infrastructure projects towards workers' safety. There were seven (7) factors listed in the questionnaire survey to answer this objective: poor safety culture in the organisation, lack of incentives from employers, lack of motivation among construction workers, tight project schedule, poor participation in the safety management practices and inadequate resources.

Poor Safety Culture in the Organisation

Safety culture is one of the factors that need to be improved in maintaining a safe and healthy working environment among construction workers. Safety culture is constantly mentioned by previous researcher that it is related to a situation involving workers' behaviour, attitude, discipline, and communication (Leonard et al., 2018). Working in a new environment for a construction project, it is quite challenging for both local and foreign construction workers as they are different in religious, belief, language, and tradition (Hasan et al., 2018). He further explains that, when the multi-languages construction workers having difficulties in communicating with each other, the poor safety culture occurred and will lead to poor safety performance. In the organisation level, the top management's failure to recognise or remedy the deficiencies in its safety systems may also be an indicative of a workplace with weak safety culture (Aburumman et al., 2019). As a result, these flaws persist for a very long period and could even get worse. Consequently, there is a higher chance for a potential harmful event that may take place, possibly leading to harm or death.

Lack of Incentives from Employer

The lack of incentive become the major problem especially when dealing with financial aid to overcome certain problems. In fact, many approaches had been undertaken by employer in improving the safety performance of construction workers which also include the preparation incentive (Ghasemi et al., 2015). Incentive is proven as an important factor in any constructions as it can be elaborated into different kind of schemes which can help to motivate the construction workers and funding purposes for construction activities. Ghasemi et al (2015) further stated that using incentive as a plan to motivate construction workers is helpful and will lead to improvement in safety performance.

Lack of Motivation among Construction Workers

It is crucial for top management to care for their employees and to guarantee that they are content in their positions because dissatisfied workers provide poor results (Osabiya et al., 2015). Any organisation's success depends on its manager's capacity to create an environment that inspires its workforce. The fundamental idea behind motivation is that people are driven to try to achieve a particular goal in order to satisfy a need or expectation. However, the lack of motivation among construction workers are derived from several problems occurred during construction project. Osabiya et al., (2015) listed several factors that contribute to the lack of motivation among construction workers which are poor safety training, unequal treatment from employer, and lack of supervision from supervisors.

Tight Project Schedule

A project can be defined as a temporary effort or activity carried out to produce something beneficial for other people. Project is a temporary type as it has the starting time and ending which is the delivering process (Mubarak, 2015). In construction project, risk is a contributing factor that can imposed negative impacts to the construction project. El-Sayegh et al (2018) had stated that a tight project schedule is one of the risks that may inflict difficulty to the construction project. He further explained that tight project schedule is within the capacity of employer or manager, whether his/her employees are adequate or capable enough to handle the stress from tight project schedule.

Poor Participation in Safety Management Practices

Participation can be defined as the act of taking part or get involve in certain activities or events (Cambridge, 2021). The participation of construction workers in every safety related activity or training program is crucial in determined the result of safety performance and safety culture in a project (Bayram et al., 2021). Establishing a favourable safety culture in the workplace depends heavily on employees' adherence to and participation in organisation's policy and safety training program. In order to provide a safe and healthy work environment, it is essential to ensure employee engagement in safety-related procedures. Employees will become more engaged and interested in health and safety issues once they realise that they are also responsible for preventing accidents and occupational illnesses. Other than that, employee engagement in safety also depicted as employee's actions that indirectly enhance safety work procedure while not directly affecting their own safety (Bayram et al., 2021). Therefore, it can be inferred that poor participation in safety will lead to chaos and problems in construction project.

Inadequate Resources

The main struggle in infrastructure project and other construction projects is to mitigate the risk of accidents, fatalities, and injuries among construction workers on site. Due to that, the implementation of safety in construction project become one of the keys in solving these long-standing problems. Therefore, in managing and conducting safety work procedure on site it requires a lot of resources. Shohet et al (2018) giving an idea that resource in managing safety is much related to the funding or cost. If an accident happens during the progress of construction project, there will be direct and indirect cost involved to manage the project and welfare of the workers. Zidane et al (2017) added that resources is related to the level of efficiency in conducting an activity. Furthermore, a project that effectively managed the resources while staying within its budget is referred to as project efficiency. Therefore, organisation need to be wise in managing and allocating the resources adequately for construction safety.

Methodology

This research used quantitative method and snowball sampling technique in acquiring the data. Questionnaire surveys were distributed to the safety officers who worked at G7 contractor companies in Kuala Lumpur area, who specialised in the construction of infrastructure projects. A set of questionnaire was distributed to the first targeted respondent via WhatsApp platform and the respondent shared the survey form to his colleagues. Then, the number of respondents were getting bigger. The number of target population was 428 and the sample size required during data collection was 205, as based on (Krejcie & Morgan, 1970) table of sample size. However, according to Medway and Fulton (2012) the response rate for online data collection via online platform was adequate at 20% from the sample size. This is supported by Nulty (2008) who stated that the response rate via online distribution platform is at 20%-23%.Therefore, this research recorded 43 responses out of 205 survey form distributed which equals to 21% from the sample size.

For the questionnaire survey, it contained two (2) sections which comprising of demographic questions and factors that hinder the implementation of safety management practices in infrastructure projects towards workers' safety. The respondents were required to answer 5-point Likert scale questions of 'Strongly Disagree' to 'Strongly Agree'. Section A is about the demographic questions pertaining to the background of the respondents. In this section,

there are 6 items to determine the background information for respondents such as gender, age, educational background, working experience, type of infrastructure project involved, and the location of infrastructure project involved. Section B is pertaining to factors that hinder the implementation of safety management practices in infrastructure projects toward workers' safety.

Analysis and Findings

Based on Table 1 below, it shows the result on the factors that hinders the safety management practices in the construction of infrastructure projects. may contribute to the better safety management practices in infrastructure projects towards workers' safety. There are seven (7) factors which are ranked according to the level of agreement.

Table 1

Ranking of factors that hinder the safety management practices in infrastructure projects.

Factors	Mean score	Rank
Tight project schedule	4.23	1
Poor participation in the safety management implementation	4.21	2
Poor safety culture in organisation	4.16	3
Inadequate resources	4.00	4
Workers failed to follow and adhere to safety regulations	4.00	5
Lack of incentive from employer	3.93	6
Lack of motivation from construction workers	3.63	7

Based on the table above, tight project schedule become the most agreed answer choice among respondents as compared to the other answers. It recorded 4.23 in mean score and 79% (34 respondents) agree with the answer. Tight project schedule is one of the most important factor that may inflict risk to the construction project which include the safety risk. According to Bafrouei et al (2015), tight project schedule recorded the highest percentage as a factor that may inflict greater risk to the safety implementation in the infrastructure construction project. The author also mentioned that with the busy project schedule, the construction workers tend to simplify the safety measures implied to them which can create problems in the future.

Other than that, poor participation in the safety management implementation ranked second in the table with 4.21 recorded mean score and 81.4% (35 respondents) were agreed to this answer. After the safety training program being participated by the construction workers, they already had the knowledge and need to cultivate it into their daily working activities. The worst-case scenario is when the construction workers did not apply the knowledge gained from the safety training program into their activities on site. This is supported by Skeepers et al (2015) when he stated that the acceptance and practices of safety in construction project are all based on workers' involvement whether they want it or not.

Then, third rank for this section is poor safety culture in organisation. This factor recorded 4.16 mean score and 79.1% (34 respondents) were agreed. Al-Bayati et al (2019) explained the difference in the meaning of safety culture and safety climate in construction project as both will influence the safety performance of the project. Safety culture define as the higher-up management involvement in safety while the safety on site is the safety climate concern. He explains further that the main factors that will greatly impact the safety culture in construction project are the commitment and performance of organisation towards safety implementation in a project. Therefore, the poor performance of organisation reflects to poor safety culture in construction.

Next factors are inadequate resources and workers not following and adhering to the safety regulations are ranked 4th and 5th factors respectively. This are followed by lack of incentives from employers and lastly lack of motivations from construction workers. It proves that the last two factors are the least affected in the safety management practices. Thus this finding is in contrary to Osabiya et al (2015) where poor safety training, unequal treatment from employer, and lack of supervision from supervisors were not impeding the safety management practices in the construction of infrastructure projects.

Conclusion

Based on the factors listed in the questionnaire survey, it can be concluded that this research tried to get the opinions and perspectives from the respondents in different scope of research compared to the previous researchers.To sum up, the most important hindrance factor that may contribute to the poor safety management practices in the construction of infrastructure projects are tight project schedule, poor participation of workers on the safety management practices and poor safety culture in the organisation. Thus, if these factors are able to be tackled and improved by the organisation, the effects could be seen by the reduction in the number of incidents and fatalities on site. Then, it is suggested that future researchers may conduct a qualitative studies such as interview session, in order to obtain a more accurate and in-depth data .

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