Journal of Sustainability Science and Management
Volume 18 Number 2, February 2023: 116-125
eISSN: 2672-7226

OCCUPATIONAL SAFETY AND HEALTH (OSH) MANAGEMENT PRACTICES OF BUILDING CONTRACTORS IN JOHOR, MALAYSIA

FATIN NURFAZIRA KHASNIMAN, NOR HASLINDA ABAS*, SUSHILAWATI ISMAIL, MUHAMAD HANAFI RAHMAT AND MUHAMMAD FIKRI HASMORI

Jamilus Research Centre, Faculty of Civil Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia, 86400 Batu Pahat, Johor, Malaysia.

**Corresponding author: nhaslin@uthm.edu.my*
Submitted final draft: 10 June 2022 *Accepted: 7 January 2023* http://doi.org/10.46754/jssm.2023.02.009

Abstract: It is believed that some building construction contractors are less aware of the safety and health aspects and are more likely to pursue profits over the safety and health of workers and people living near the construction site. Therefore, this study aims to investigate the implementation of safety and health practices by building contractors in Johor, Malaysia. This study employs a survey method distributing survey instruments to G6 and G7 contractors in Johor. Through this method, respondents need to choose which practices they had implemented at their company, give opinions on the factors that hinder the implementation such practices, and propose solutions to overcome those problems. Through this survey, the level of implementation of safety and health management practices among contractors was obtained. This study has also helped provide a better understanding of the current safety and health management practices implemented by contractors in the state and will provide information on the barriers to the implementation of safety and health management practices as well as solutions to problems faced by contractors in implementing those best practices.

Keywords: Occupational safety and health, safety practices, contractors, construction.
Abbreviations: Safety and Health (S&H), Safety and Health Officer (SHO), Site Safety Supervisor (SSS).

Introduction

The construction industry is considered a very dangerous industry and usually contributes to the most occupational deaths in developing countries, including Malaysia (Nguyen *et al.,* 2015). In some countries, it is a common occurrence to hear about an accident or tragic event that causes injury, illness, or death of an employee or site worker (Manu *et al.*, 2018). The construction industry is perceived as dangerous and difficult to control (Goh *et al.,* 2015). Accidents occur unexpectedly, which result in many negative consequences such loss time injury to personnel, damage to plants and equipment, loss of production, and ultimately a disruption of production flow. However, in order to ensure the profitability and continuous development of the construction sector, the issue of safety and health management practices should be emphasised to ensure that the safety and well-being of the workers and people living near the construction site are prioritised.

The lack of proper health and safety practices can cause project delays, cost extensions, and loss of life due to accidents, Safety and Health (S&H) management performance might be the most crucial factor in construction management (Phung *et al.,* 2015). It is a component that makes a substantial contribution to the construction sector among the various elements impacting the performance of safety and health management.

In Malaysia, most employers in the construction industry are still not concerned with the S&H of their workers. Most employers especially contractors lack knowledge and safety awareness (Lim & Al-Rejal, 2016). Previous research has shown that employers gave little consideration and some of them did not pay any attention to employees' S&H (Adebiyi *et al.,* 2009; Shamsuddin *et al.,*

2015). Accidents at work will have a negative impact on the organisation and the country such as loss or damage to property and life. Occupational safety and health (OSH) practices in the construction industry are very important to eliminate and prevent accidents or workplace injuries (Shamsuddin *et al.,* 2015).

The implementation of S&H management practices has been shown to significantly reduce the incidence of fatalities, injuries, illness, and accidents (Hassan & Jha, 2013). Additionally, S&H management practices help businesses to show all stakeholders that their business is socially responsible, ensure image enhancement, increase brand value, and broaden the organisational reputation of the firm (Abas *et al*., 2020). It also helps maintain or increase investor confidence and helps develop positive stakeholder engagement at all levels that allows the company to meet customer expectations and encourage employees to stay on for longer (Manu *et al.,* 2018). Moreover, another benefit of S&H management practices is to increase competitiveness between organisations. S&H management practices can also provide additional income to businesses, as well as reduce the cost of compensation for damage and losses caused by improper S&H management practices (Abas *et al.,* 2020).

However, organisations nowadays face many challenges when it comes to OSH policies and implementation plans, for example the written S&H policy in the organisation maybe not well-formulated. It is the responsibility of the owners of each organisation to maintain higher S&H standards in their workplace (Nguyen *et al.,* 2015). Despite the fact that the importance of S&H policies and programmes has been emphasised, some owners and even individual managers in the organisation have always underestimated this issue. This scenario is a challenge to the effective OSH implementation programs.

The contractors' awareness of OSH management is also one of the important points to consider so that all projects can be undertaken and completed without any problems, injuries and accidents at the construction site. Lack of awareness of OSH management systems in construction by builders would lead to accidents at construction sites (Mohd Kamar *et al.,* 2014). Most contractors have at least one troublesome, accident-prone employee. Some employees find it difficult to deal with, or do not work properly and have difficulty in obeying and accepting other people's instructions.

This study was conducted to review the S&H management practices implemented by building contractors in Johor, Malaysia to identify areas that need to be improved. Two objectives were highlighted in the study, as follows:

(i) Investigate S&H management practices implemented by contractors in Johor and

(ii) Determine the problems faced by contractors in Johor to implement S&H management practices.

Materials and Methods

This study involved collecting information on the research scope from existing resources such as conference proceedings. journal papers, websites, and others. Next, the survey form was developed, which consisted of three parts:

Section A - Background of the participating company.

Section B - Implementation of S&H management practices by the contractors and

Section C - Open-ended questions in which the participants needed to give their opinion on the factors that prevented some contractors from implementing the proposed practices and solutions.

Before distributing the survey to the construction organisation's representative, a pilot study was conducted. The purpose of this pilot study was to ensure that the collection of data obtained from these survey instruments was valid. The survey design was distributed to five experienced Safety and Health Officer (SHO) in the construction industry. They provided comments and suggested improvements to the survey.

After all the corrections were made based on the pilot study, the survey instruments were distributed to contractors around Johor. The questionnaire was transferred into a Google survey form, then distributed with a link that could be shared with all representatives via an online platform. 60 responses were received that represented the number of contractors responding to the survey. The data was analysed using the percentage method to identify the frequency of contractors implementing S&H management practices at their construction sites.

Results and Discussion

Implementation of Safety and Health Management Practices Status

Table 1 shows the status of S&H management practices implemented by building contractors at construction sites in Johor. In general, it can be seen that most of the S&H management practices had been implemented by participating contractors at their construction sites. For example, 30 of the 33 safety and health management practices were implemented by

Table 1: Status of safety and health management practices implemented by contractors at Johor construction site

	Implementation of Safety and Health Management Practices in Construction Site	Number of Project Sites Implemented	Number of Project Sites Implemented	Implementation Percentage (%)
	Policy			
1	Formal company statement of S&H policy	59	1	98.3
2	A company stakeholder with full responsibility for S&H	60	0	100
3	Display S&H policy at the site area (e.g., site office)	57	3	95
	Organizing for safety and health			
4	Provide OSH personnel (SHO & SSS)	58	2	96.7
5	Employees were informed about OSH rules and regulation (e.g., posters)	60	0	100
6	Engaging employers and employees on S&H issues (e.g., S&H meetings)	59	1	98.3
7	Propagating S&H practices to external stakeholders (e.g., clients)	57	3	95
8	A designated S&H department	55	5	91.7
9	Providing OSH training for safety personnel	58	2	96.7
10	Provision of S&H monthly and annual reports	57	3	95
11	S&H committee was formed at every site with 40 or more workers	56	4	93.3
	Risk assessment			
12	Risk assessments such as HIRARC or JSA was conducted prior to the commencement of the project	58	2	96.7
13	Creating site rules and strategies to mitigate identified hazards or reduce assessed risks	59	1	98.3
14	Reviewing and updating risk assessments during construction from time to times	56	4	93.3

15	Before work begins, personnel were informed about potential risks and control mechanisms on the job site (e.g., toolbox talk or short briefing)	58	2	96.7
	Planning and implementation			
16	Preparing S&H plans for every construction project	59	1	98.3
17	Putting in place site S&H policies and procedures	59	1	98.3
18	Changing and modifying construction S&H plans	59	1	98.3
19	S&H insurance cover for sites	58	2	96.7
20	Providing OSH training for site workers	60	0	100
21	Carrying out site OSH inspections audit regularly	54	6	90
22	On-site sanitation and welfare amenities are provided (e.g., toilets, canteens, drinking water)	53	7	88.3
23	Provision of personal protective equipment	59	1	98.3
24	Provision of first aid equipment on sites	59	1	98.3
25	Setting S&H performance targets	55	5	91.7
26	Disciplining employees for dangerous workplace behaviour	59	1	98.3
	Measuring and reviewing performance			
27	Measuring S&H performance against set targets	54	6	90
28	Reviewing and updating S&H plans after the completion of the project	50	10	83.3
29	Maintaining incident records on every project	58	2	96.7
30	Investigating the causes of incidents, accidents and near-misses	58	2	96.7
	Auditing			
31	Undertaking the OSH management system audit periodically	52	8	86.7
32	Use of external consultant for undertaking OSH management auditing (e.g., client)	39	21	65
33	Use of in-house personnel for undertaking OSH management auditing	58	2	96.7

more than 90% of participating contractors. From the table above, there were three S&H management practices that had been implemented by all contractors, which were a company stakeholder with full responsibility for S&H, employees were informed about occupational S&H rules and regulation (such as posters), and provided occupational S&H training for on-site workers. In total, 2 of the 33 S&H practices were implemented by 80% of participating contractors. Meanwhile, the least implemented S&H management strategy was the use of external consultants for undertaking OSH management auditing (e.g., client). Only 65% of participating contractors implemented it in their projects.

The purpose of the OSH policy is to create a systematic OSH environment at the construction project sites based on the demand of the construction site. An effective policy sets a definite direction for the organisation to adhere to. The management system will not be effective if there is no clear policy that demonstrates the dedication of the senior management to safeguard the welfare of employees and all those affected by their business. Most of the construction project sites in the survey (98.3%) had a formal company statement for S&H policy meanwhile 100% of the companies that took part in this survey had a company stakeholder that was wholly responsible for S&H. In addition, 95% of construction project sites had exhibited S&H policies in the site area. It was a good result of S&H management practices at the construction site according to the policy aspects.

The S&H management practice group continues to support S&H, which emphasizes the strong commitment and participation of management. Without the support of the top management, S&H practices will not be managed even though there are numerous laws and directives from the government.

The analysis has shown that more than 90% of the practices in this element had been implemented by the construction project site. All construction project sites had informed their employees of the OSH rules and regulations. However, there was only 1 construction project site that reported their company did not engage the employers and employees on safety and health issues. In addition, there were 96.7% construction project sites that provided OSH personnel in their companies such as SHO or SSS, and trained them on OSH. Moreover, the construction projects that had propagated S&H practices for external stakeholders and prepared the S&H monthly and annual reports accounted for 95% of the total. Some of the construction project sites did not implement proper S&H practices at the site where no S&H committee was formed. They should have been one at every site with 40 or more workers and there was also no designated S&H department in their company. These results show that the data was impressive because almost all construction project sites implemented S&H management practices with organized S&H elements. This was able to reduce the accident rates at the construction site.

Next, risk assessment is another important element at the core of S&H management that allows for identifying risks and hazards at the construction site. 96.7% of the sites had conducted a Hazard Identification, Risk Assessment and Risk Control (HIRARC) or a Job Safety Analysis (JSA) before the project commenced and informed employees of the hazards including on-site control measures before work began such as during toolbox discussions or briefings. Most construction project sites had planned site regulations and measures to reduce the risks associated with the workplace except for one. In addition, other practices to be implemented by contractors had been reviewed and updated risk assessment during construction was conducted from time to time and 93.9% of the construction sites had implemented such practices. This suggests that there were still a small number of contractors who have not yet taken an initiative-taking approach to address hazards when starting a project.

Planning is the act of determining how to do something and implementation is the act of putting a plan into action. This aspect

focuses on how to organise and realise S&H management practices at the construction site. The results stipulate that there was a high level of implementation in this element with most practices being implemented by more than 90% of construction project sites. All construction project sites stated that their company provided training for site workers. However, among all these practices, there was only one construction project site that stated its company did not implement training, including providing S&H plans for each construction project, site regulations, S&H measures, amending and correcting S&H plans during construction, providing Personal Protective Equipment (PPE). Moreover, 96.7% of the construction project sites stated that their company had S&H insurance. Other results still set a high level of implementation for this category with some practices implemented by more than 85% of construction project sites. These practices had been set as S&H performance targets (91.7%), there were regular OSH inspection audits (90%) conducted and there was a provision of sanitation and welfare facilities on site such as toilets, canteens, and drinking water (88.3%). During a site visit at the government's project site, the company's SHO said they needed to prepare a Safety and Health Management Plan (SHMP) as evidence when there was an accident at the construction site.

Performance measurement and review should be carried out to assess the effectiveness of the system at construction companies. This practice would prove the efficiency of the S&H management of the company and note its strengths and weaknesses. It is an important element of the management system, including S&H management. Data has shown that 96.7% of construction project sites kept records of incidents on each project and investigate the cause of incidents, accidents, and near misses. In addition, this was followed by 90% of construction project sites that measured S&H performance against the set targets. In addition, 50 people said their company reviews and updates the S&H plan upon the completion of a project. Contractors need to review and improve their S&H management systems regularly so that the company's S&H performance can be improved.

Some 86.7% of respondents said their company conducted regular audits on the OSH management system while 58 construction project sites had employed internal staff to conduct OSH management audits.

In comparison with the previous study by Phung *et al.* (2015) in Vietnam, the implementation of S&H management practices at construction project sites by contractors in Johor was better than the implementation by contractors in South Vietnam. The average number of contractors that implemented some S&H management practices was 66.2% while 94.4% of contractors in Johor implemented every S&H management practice. In addition, the study shows that the least implemented S&H management strategy was the use of external consultants to conduct OSH management audits, only 12% of South Vietnamese contractors used external consultants and 65% of contractors in Johor used external consultants.

According to Manu *et al.* (2018), the implementation of S&H management practices at construction sites in Malaysia was better than in Vietnam and Cambodia, from a policy practices standpoint. However, in Malaysia, the implementation of S&H management practices involving planning, risk assessment, organising, planning and implementation, measuring and reviewing, and auditing was lower than that of Vietnam and Cambodia.

Problems for Implementing Safety and Health Management Practices

Table 2 shows the frequency of contractors with regards to the problems in implementing S&H management practices. Half of the participants argued that this issue was due to budget limitations for the safety and health activities for employees. Some of them said about 10% of the contract value of the awarded projects were made available for safety issues. For example, for the contract value of a project awarded 20

Table 2: Problem faced by contractors to implement safety and health practices

Problems	Frequency	Percentage (%)
Issue of budget	30	50
Lack of awareness and knowledge	10	16.7
Communication problem with foreigner workers	6	10
Stubborn workers	5	8.3
Stubborn foreigner contractors	4	6.7
Less enforcement from government	3	5
Want to speed up the progress	2	3.3

million, 10% of 20 million i.e., 2 million would be allocated for use to address safety issues. Some of the contractors thought, the allocation was a little high and they could have used that budget for something else. Therefore, they must bear that cost because safety is the most important element at construction sites as it is a high risk environment. This is in line with previous studies by Dorji and Hadikasumo (2006) that financial or budgetary constraints were among the factors influencing safety management issues.

A total of 10 respondents agreed that a lack of awareness and knowledge led to this problem. It was difficult to control and manage employers and employees according to safety and health issues because they thought that accidents could be avoided on their own and they took it easy on this issue because contractors often ignore safety measures during the design and procurement stages. All levels of management should demonstrate and provide their support to S&H programs to make the management of S&H programmes effective. Effective S&H management practices cannot be achieved without a high level of awareness of the problem.

Moreover, there were 10% representatives who agreed that communication problems with foreign workers led to problems with the implementation of S&H management practices at construction sites. Poor communication leads to the failure of the project. Most of the foreign construction workers did not get preparatory classes before they came to work in Malaysia unlike foreigners studying in Malaysia. They had to learn Malay language on their own. Some of them cannot speak or understand English. This would make it more difficult for them to gain access to any information.

Apart from this, the other problems were stubborn workers (8.3%), stubborn foreigner contractors (6.7%), lax enforcement from the government (5%) and contractors who wanted to speed up the progress (3.3%). There were some representatives who said that most of the contractors experiencing this problem were foreign contractors, who usually did not know and did not want to learn or understand the Occupational Safety and Health Act and related regulations. Some representatives argued that government enforcement was still not strict enough because many contractors did not implement some S&H management practices. In addition, this problem was related to contractors who wanted the project to be completed on time and on budget. They considered the issue of security as excessive.

Solutions to Overcome the Problem

As for the solution to the above problems, five recommendations were mentioned by the representatives (Table 3) through open-ended answer. Most representatives suggested that companies should provide S&H training in all aspects such as budget allocation and training for S&H practices at construction sites (28.3%). Similarly, they suggested that the top management should revise the project contract. For example, if the contract does not specify the amount of OSH resources, the client would have

Table 3: Solutions to overcome the problems

Solution	Frequency	Percentage (%)
Safety and health training	17	28.3
The top management should revise the contract of project	17	28.3
The government should revise OSHA and tighten it	12	20
Advise each other (employers and employees)	8	13.3
Appoints a translator among the workers	6	10

to revise the contract or make the S&H of the employee a valuable Variance Order (VO), so SHO and SSS can perform on-site.

20% of representatives who suggested that the government should revise OSHA and tighten it. Stricter requirements should be implemented starting from the design stage where it must be registered with the Department of Occupational Safety and Health (DOSH) or other relevant bodies. The government could also conduct periodic site visits or inspections by those related to checking the necessary S&H practices on site.

13.3% of the representatives said that in their company, needed to advise and communicate about their safety policy to all workers and relevant parties, including contractors, sub-contractor, staff workers, temporary workers, and suppliers. Safety personnel also need to play a role. They should advise top management levels and give them penalties when they do not implement on-site safety and health management practices.

Since 10% of representatives mentioned communication problems at the construction site, the same representative also suggested that the contractor should appoint a translator. This would make it easier for foreign workers to understand all the information provided. Appointing an external translator may incur additional costs, so the contractor can pick a translator from a pool of employees who can speak and understand in both languages.

Conclusion

In conclusion, the frequency of S&H management practices implemented by contractors in Johor by element were policy (97.8%), organising for S&H (95.8%), risk assessment (96.3%), planning and implementation (96.1%), measuring performance (92%) and auditing (82.8%). In conclusion, critical elements were audited as 35% of construction project sites did not use external consultants to conduct Occupational Safety and Health (OSH) management audits. Most likely, there was a bias when the contractor only uses an internal consultant to conduct an OSH management audit. Only 5.6% of them did not implement some S&H management practices.

This study analysed whether contractors in Johor implemented proper S&H management practices. From the data, most contractors implemented proper S&H management practices at construction sites. This data was acceptable because the accident case data showed 61.7% reported zero accidents at the project sites, 22 construction sites reported between one and five cases, and only one respondent said there were between six and ten accident cases at his site.

In comparison, a study by Phung *et al*. (2015) in Vietnam, the implementation of S&H management practices by contractors in Johor was better than the implementation by contractors in South Vietnam. Limitations in this research study were due to time constraints and this led to not being able to collect even more samples. Other limitations included the movement control order, so there were no physical site visits which could have been conducted when data was being collected.

Another limitation of this study was that the collection of data focused only on contractors in Johor. Thus, the data could not be used to

represent the local construction sector. However, it still could be used as reference for the proper S&H management practices in Malaysia.

As for the recommendation, the government must continue to provide and promote initiatives to improve S&H management practices in Malaysia although there are still some contractors who do not comply with proper S&H management.

They need to provide clear direction on the aspects and components of safety and health management as unclear information will lead to failure. Indeed, practices in various aspects of S&H management should be targeted for improvement. By sharing which practices were commonly implemented at construction sites around Johor, and which were not, the results of the study can inform relevant state authorities of what need to pay more attention to in order to reduce the risk of accidents on construction sites. The same goes for the problems faced by contractors in Johor; so that they too can implement S&H management practices that need to be overcome with proposed solutions as mentioned earlier so that it can help boost investor confidence from other countries.

Acknowledgements

This research was made possible through monetary assistance provided by Universiti Tun Hussein Onn Malaysia and the UTHM Publisher's Office via Publication Fund E15216.

References

Abas, N. H., Nurahum, M. H., Yasin, N., & Rahmat, M. H. (2020). Safety incentive program for construction project: Case studies of several construction projects in Klang Valley, Malaysia. *Civil Engineering and Architecture, 8*(3), 359-365.

Adebiyi, K. A. A., Charles-Owaba, O. E., & Eneyo, E. S. S. (2009). Modeling the impact of hazardous conditions in a manufacturing safety program. *The Pacific Journal of Science and Technology*, *10*(2), 988-995.

Dorji, K., & Hadikusumo, B. H. W. (2006). Safety management practices in the Bhutanese construction industry. *Journal of Construction in Developing Countries*, *11*(2), 53-75.

Ganesh, C. S., & Krishnan, R. (2016). A review of occupational injury research in Malaysia. *Medical Journal of Malaysia, 71*, 100-104.

Goh, A. P. T., Abdulllah, M. N., Misnan, M. S. Jaafar, M. N., & Lee, J. Y. M. (2015). A review on the effectiveness of safety training methods for Malaysia construction industry. *Jurnal Teknologi, 74*(2), 9-13.

Habib, S., Masood, H., Hassan, T., Mubeen, M., & Baig, U. (2015). Operational risk management in corporate and banking sector of Pakistan. *SSRN Electronic Journal*, *4*(5), 1-10.

Hassan, A., & Jha, K. N. (2013). Safety incentive and penalty provisions in Indian construction projects and their impact on safety performance. *International Journal of Injury Control and Safety Promotion, 20*(1), 3-12.

Hussian, M. Y. (2013). *The relationship between safety climate and safety performance*. [Master's thesis: Universiti Kebangsaan Malaysia].

Manu, P., Mahamadu, A. M., Phung, V. M., Nguyen, T. T., Ath, C., Heng, A. Y. T., & Kit, S. C. (2018). Health and safety management practices of contractors in Southeast Asia: A multi country study of Cambodia, Vietnam, and Malaysia. *Safety Science, 107*, 188-201.

Mohd Kamar, I. F., Lop, N. S., Mat Salleh, N., Mamter, S., & Suhaimi, H. A. (2014). Contractor's awareness on Occupational Safety and Health (OSH) management systems in construction industry. *E3S Web of Conferences*, *3*(2014), 01019.

Nguyen, T. T., Manu, P., Mahamadu, A. M., & Ash, S. (2015). *Inquiry into the health and safety management practices of contractors in Vietnam: Preliminary*

findings. Proceedings CIB W099 2015, Belfast. http://www.irbnet.de/daten/iconda/CIB_DC29740.pdf

Phung, V. M., Manu, P., & Mahamadu, A. M. (2015). *A Study of Health and Safety Management Practices of Contractors in Southern Vietnam* [Paper presentation]. The 6th International Conference on Construction Engineering and Project Management (ICCEPM 2015).

Shamsuddin, K. A., Ani, M. N. C., Ismail, A. K., & Ibrahim, M. R. (2015). Investigation the Safety, Health and Environment (SHE) protection in construction area. *International Research Journal of Engineering and Technology, 2*(5), 624-636.

Yee, L. H., & AL-Rejal, H. M. E. A. (2016). *Occupational Safety and Health Practices in Manufacturing Industry* [Paper presentation]. Proceedings of Symposium on Technology Management & Logistics (STML–Go Green).