



# Enforcement of OSH Regulations in Malaysia's Manufacturing Sector: An Empirical Investigation

Jian Ai Yeow<sup>1</sup>(✉), Dennis W. K. Khong<sup>2</sup>, Tee Suan Chin<sup>1</sup>, and Afandi Yusof<sup>1</sup>

<sup>1</sup> Faculty of Business, Multimedia University, Melaka, Malaysia  
jayeow@mmu.edu.my

<sup>2</sup> Faculty of Law, Multimedia University, Melaka, Malaysia

**Abstract.** Workplace accidents and injuries especially manufacturing industries are in an alarming stage. Yearly, more than 2000 cases were reported to Department of Safety and Health in Malaysia. This study highlighted the needs of having enforcement of safety and health regulations in the manufacturing industry with survey of 272 respondents. The data was analysed using SPSS Process Macro analysis and it shows there is a moderating effect of enforcement of safety and health regulations with working condition and reducing workplace accidents and injuries.

**Keywords:** Occupational Safety and Health Act 1994 · Malaysia · Small and medium enterprises · Manufacturing Sector

## 1 Introduction

In Malaysia, most of the employers and employees are liable to ensure their own safety at workplace and this is called as a self-regulation approach of regulating Occupational Safety and Health (OSH) in the workplace [1]. The Occupational Safety and Health Act (OSHA) 1994, however provides several legal frameworks for OSH regulations that make it as a legal duty of an employer to provide a safe and healthy workplace to their workers [1]. Section 15(1) of the Malaysian Occupational Safety and Health Act 1994 states that “it shall be the duty of every employer and every self-employed to ensure, so far as is practicable, the safety, health and welfare at work of all his employees”. Notwithstanding thus, it takes two hands to clap. Both employers and employees should be aware of workplace safety [2].

The Malaysia SMEs corporation [3] defined that any manufacturing firm with a sales turnover of less than RM50 million or having less than 200 full time employee can be defined as Small Medium Enterprises (SME). From time to time, surveys have been conducted in Malaysia and they show that compliance with Occupational Safety and Health (OSH) regulations is not widely practiced by small and medium enterprises (SMEs) [4]. The SMEs usually involved in various operations and involving the risk of higher workplace accidents and injuries [5]. Additionally, the surveys show that a large

proportion of SMEs human resource or personnel departments cannot be considered competent in their knowledge, skill and ability to implement OSH regulations in their organisations [5]. Instead, only selected medium-sized companies with safety and health officers have in-depth knowledge of OSH requirements. As a result, workplace accidents and injuries happen at an alarming rate in Malaysia.

A workplace injury is any injury that occurs while an employee is performing his or her work [6]. From a legal point of view, an employer's obligations can be summarized into three categories: (i) ensure a safe and healthy workplace for employees, (ii) ensure all employees are knowledgeable about the organisation's OSH policy, and (iii) enforce the organisation's OSH policy objectively and consistently. Any employer who does not meet these obligations may be charged for an offence [7].

Negligence on the part of employers leads to serious consequences as it may entail a financial loss, and in the worst case, loss of life [8]. Employers may be fined if any employees suffer a workplace injury or accident. Additionally, any injury or accident occurring in the workplace may also give rise to indirect costs such as loss of work time, slow down in productivity, temporarily closure of operations and other administrative cost. Additionally, workplace accidents and injuries could damage a company's image and reputation. In the worst-case scenario, a company's operation might be forced to shut down for safety and health's inspection [9].

It is estimated that approximately 80% to 90% of total reported workplace accidents and injuries in Malaysia are from SMEs. On the other hand, the Department of Safety and Health (DOSH) does not publicly make available official SME statistic. This lacuna in the data should be filled as soon as possible to enable the achievement of the Malaysian Occupational Safety and Health Master Plan 2025 as developed by Department of Safety and Health (DOSH) [5].

There is a general perception that SMEs do not have a formal system of safety management and are unaware of the workplace hazards. In addition, they may have poor access to supportive organisations or trade associations that can provide assistance or advice to them on Occupational Safety and Health (OSH) issues [10]. Thus, it is almost impossible to achieve the vision of "zero accidents" in SMEs as many employees and employers are unaware of the relevant safety rules and regulations. Hence, a specific OSH policy for SMEs is needed [11].

The Occupational Safety and Health Master Plan 2025 includes several programmes on safety and a Comprehensive Induction Module on OSH for SMEs which must be rolled out to all companies' employees. The Malaysia Social Security Organization (SOCISO), also known as *Persatuan Keselamatan Sosial* (PERKESO,) has included a 'Program Geran Penuh atau Padanan Caruman Skim Keselamatan Sosial Pekerjaan Sendiri (SKSPS)' in their year 2022 budget for providing more safety coverage, benefits and information to SMEs especially those who are self-employed [11][5]. It is expected that after the roll out, all employees are expected to understand the importance of OSH regulations and the achievement of a 'Vision Zero' of no accidents in the workplace the objective of this study is to identify the effect of poor workplace condition leading to workplace accident and injuries [12] (Fig. 1).

No doubt there are several causes of workplace accidents and injuries in manufacturing plants. This study focuses on workplace working condition as it is the foundation or

the internal issues that can be controlled and act immediately. It is a good HR practices starts from a conducive work conditions and environment where it makes the employees feel safer and to accomplish their job performance [13]. The implication of workplace enforcement in safety regulations will be tested as moderating effect between working condition and workplace accident and injuries [14].

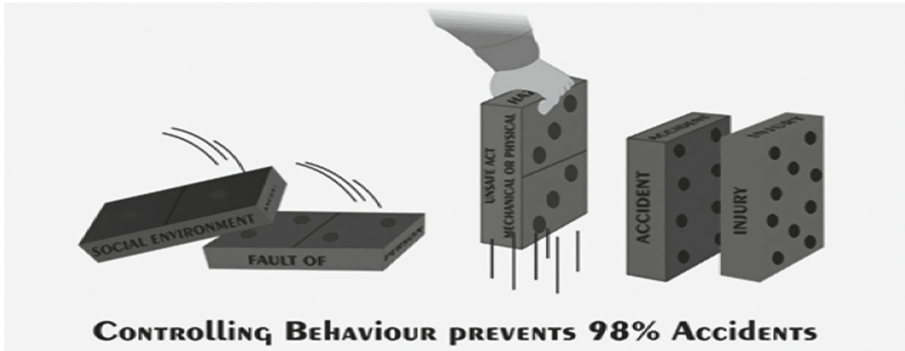
## 2 Literature Review

Table 1 shows the overall comparison of Industries workplace accidents and injuries reported to DOSH from year 2017 till August 2021 [15]. This table was extracted from Department of Occupational Safety and Health Malaysia website based on sectors. Based on the Table 1, The Department of Statistics Malaysia announced a huge dropped of workplace accidents and injuries in 2020 with more 19% decrease of accidents as reported in The Star newspaper, but there are still some sectors that the workplace accidents and injuries remain high [16].

In year 2020, the total of workplace accidents and injuries is lower only for two sectors, construction as well as mining and quarrying compared with year 2017–2019. It is still considered high for manufacturing sector, wholesale, and retail trade, as well as agriculture, forestry and fishery sectors (compare with year 2017–2019) as year 2020 is imposed strict lockdown. Additionally in year 2021, the statistic reported (till the month of August) that the amount of workplace accident and injuries in wholesale and retail trade is the highest within these 5 years [5]. This clearly shows that there is still a loophole in the safety and health rules and regulations in Malaysia. This problem needs to be addressed soon to prevent more accidents from happening as industries such as

**Table 1.** Comparison of Industries workplace accidents and injuries reported to DOSH

INDUSTRIES	2017	2018	2019	2020	2021 (Jan-Aug)
Hotel and restaurants	114	123	235	<b>140</b>	71
Utilities (Electricity, Gas, water, and sanitary services)	104	173	258	<b>220</b>	131
Finance, Insurance, Real Estate, and Business Services	146	217	406	<b>327</b>	216
Construction	240	232	326	<b>206</b>	150
Transport, storage, and Communication	122	137	389	<b>311</b>	166
Manufacturing	2178	3228	4948	<b>4506</b>	2707
Wholesale and Retail trade	97	73	87	<b>128</b>	131
Public Services and Statutory Authorities	66	58	99	<b>77</b>	41
Mining and Quarrying	46	41	60	<b>39</b>	31
Agriculture, Forestry and Fishery	522	749	1176	<b>979</b>	621



**Fig. 1.** Behavioural Safety Control, ASK-EHS (Ask EHS, 2017)

manufacturing industries are considered the backbone of Malaysia's economy development industries [17].

According to The Star newspaper [18] in year 2020, an approximately of 62.8% of occupational accidents were caused by three types of accidents which include falls of person/fall from height, stepping on/striking against/struck by objects or falling objects and lastly other unclassified type of accidents. Add on, out of 16 types of injuries in workplace in year 2020, sprains and strains resulted top 4 most common injuries in workplace after wounds and fracture [19]. The result of high injuries of sprains and strains are due to poor ergonomics during lifting or working-from-home (WFH). The mishandling of tools and machineries or purchasing of unergonomic equipment in workplace or at home office eventually cause serious health problem to an employee. Therefore, it shows that injuries are still high during WFH period.

Early 2020, the Malaysia government had mentioned the Occupational Safety and Health (Amendment) Bill 2020, covered workplace injuries while worked from home. The Occupational Safety and Health (Amendment) Bill 2020 which focus on Safer Working Environment for Workers in both physical and work from home. This Bill was tabled for a second reading on 27th October 2021 in the Dewan Rakyat to amend the existing Occupational Safety and Health Act 1994 (OSHA 1994) [11].

The Proposed amendments include flexible work as well as an increased of fines from RM50,000 to RM500,000 under Section 19 for offences such as failure of employers to formulate safety and health policies [7].

With this big amount of fines imposed, the SMEs need to develop a proper safety and health guidelines and making sure an enforcement is done in their workplace. They need to start editing and amending their policies and regulations thoroughly [10]. Action should be taken immediately to prevent any accidents and injuries to again [20]. Although The Department of Safety and Health (DOSH) in Malaysia has implemented an Occupational Safety and Health Master Plan 2025 and coming up with more trainings, the SMEs must gear up and starts enforcing the safety rules and regulations in their workplace. In manufacturing sector, the involvement of machinery or tools are common especially in operation plants. It takes time to learn and cope with the complexity of the machinery. One of the local researchers identified that the factor of workers mishandling the

machine in their workplace is one of the highest contributions of workplace accident (Fredericks et al., 2008). It has been stated that a poor physical environment condition decreases a worker's concentration or productivity towards tasks given resulting error or mistake [21]. With that, hypothesis is formed that;

H1: there is a relationship between poor working condition with workplace accident and injuries in manufacturing industry

'To err is human' and the main root causes of workplace accident and injuries could also mainly due to negligence of employers or failure of workers to obey the work procedures. By investigating the causes of workplace accidents and injuries only may not be able to solve the problem unless there is a control or audit to maintain a hazard free workplace condition.

According to BBS Model or known as behavioural-based safety (BBS) [22] which originated from the works of Heinrich in the 1930s to 1940s, the employers can use this model as an effective approach to minimize hazards [10]. BBS is an internal safety measure that used to protect the health and safety of the employees and provide a safe working environment with the emphasis of accident prevention training and gaining more knowledge obtained by investigating the behaviours of employees [23][24].

In order to reduce workplace accident and injuries, by identifying the causes of workplace accident and injuries are not enough, there is a need to imply a moderating variable on controlling the behavioural of employees. The controlling element will be enforcement of safety and health rules in the workplace. Therefore, this research will study on the moderating effect of enforcement of safety and health rules significantly reduce the workplace hazard with two common independent variables of machinery handling and environment condition.

H2: Enforcement is safety and health moderates the effect of poor working condition and workplace accident and injuries.

### **3 Research Methodology**

A survey questionnaire was done with 272 respondents from SMEs manufacturing industries. The list of SMEs was obtained from the Federation of Malaysian Manufacturers (FMM) directory. Cluster sampling was employed in this study due to more than 40000 of registered manufacturing industries. The researchers clustered out the sectors into Basic metal and steel industry, electric and electronically related industry and the rubber and plastic industry whereas 3 industries were reported as the top three contribution of Malaysia manufacturing export by the Department of Statistic in year 2014 [25].

Later, the researchers reduced the samples again by clustering the geographical area to Kuala Lumpur, Selangor and Johor. These three states have the greatest number of SMEs in Malaysia compared to the other states.

### **4 Findings and Analysis**

The data was analysed using SPSS version 25. This study used Hayes PROCESS MACRO modelling to analyse the interaction between the moderator (enforcement of

**Table 2.** Coefficient Model-Working Condition

	coeff	se	t	p	LLCI	ULCI
constant	3.5224	.0266	132.6522	.0000**	3.4701	3.5746
SafetyEn	.0427	.0774	.5516	.5817	-.1098	.1952
MeanWC	.1371	.0387	3.5431	.0005**	.0609	.2133
int_1	.3105	.1079	2.8777	<b>.0043**</b>	.0981	.5230

\*\* 0.01, \* 0.05

SafetyEn (moderating variable\_enforcement in safety and health)

Mean WC (independent variable\_working condition)

**Table 3.** Interaction effect on Working Condition

Conditional effect of X on Y at values of the moderator(s)							
Interaction	SafetyEn	Effect	se	t	p	LLCI	ULCI
Low	-.2132	.0709	.0411	1.7257	.0856	-.0100	.1518
High	.7868	.3814	.0998	3.8228	<b>.0002</b>	.1850	.5779

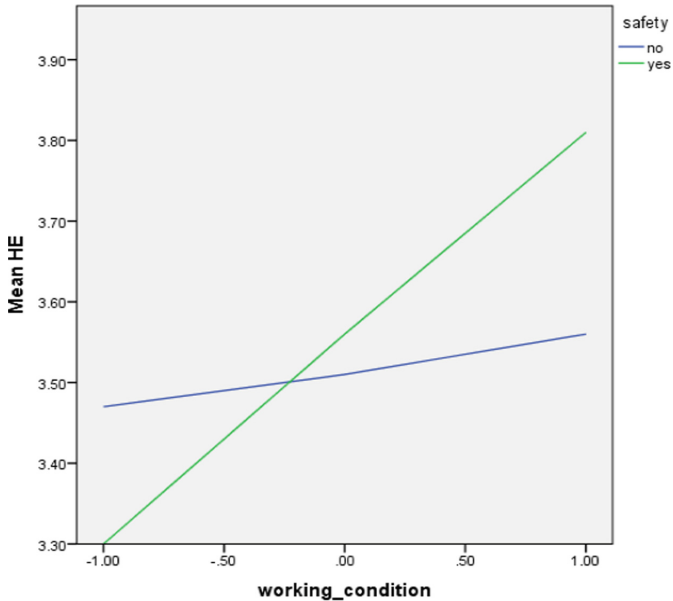
safety and health policy) with the variables [26]. PROCESS modelling was a computerized programmed SPSS to estimate the effect of X and Y through moderator(s) and mediator(s) [27].

Professor Dr. Andrew Hayes created this process modelling as a versatile computational tool for observed the effect of moderate and mediate variable. Since the objective of this study is to assess the interaction effect of enforcement of safety and health rules and regulation with the variable of working condition, this analysis is suitable to proof the moderation and conditional effect or the slope.

Besides that, common reliability test was used in this study. The Cronbach Alpha for the variables were between 0.901–0.936. The Cronbach Alpha value s are above 0.7 which consider reliable. The R2 value is 0.1019 (10.19%). In this case, it shows that around 10.19% of the variance is due to these three predictors, working condition, enforcement of safety and health and workplace accidents and injuries.

From Table 2, the int\_1 (interaction) has a t-value of 2.8777 which is above 1.645. The significant value is lower than 0.05. This shows there is a direct interaction between safety and health enforcement with workplace condition and workplace accidents and injuries where the p-value is below 0.05. Therefore, this shows that there is a direct effect on this moderator. This statistical output shows that with an enforcement of safety and health in the SMEs manufacturing industries, eventually helps in reducing workplace accidents and injuries.

Table 3, shows that there is an interaction effect (high) of safety and health enforcement with workplace condition where the p-value is below 0.05. It can be concluded that SMEs that has enforcement in OSH regulations related to working conditions will directly reduce workplace accidents and injuries.



**Fig. 2.** Moderating effect of Enforcement of Safety and Health with Working Condition and Workplace Accidents and Injuries

From Fig. 2, the line between 'Yes' and 'No' enforcement of safety and health is crossing between one and the other whereas the slope are positive slope, and the gradient are linear where it can be interpreted that the moderator has positive interaction effect on the X (Work-rest) and Y (workplace accident and injuries). The slope of 'Yes' is also steeper than the 'No' which shows a stronger influence effect if a company has enforced safety and health policy in their workplace, it will reduce the workplace accidents and injuries.

## 5 Conclusion and Discussion

Manufacturing sectors is an important sector in Malaysia as it contributed a huge amount of income distribution to the country's Gross Domestic Products (GDP) whereas the SME industry is also one of the fastest growing industries and accounted more than 48 percent of employment in Malaysia. With the supportive literature reviews and statistic data, no doubt a formal guideline on how to enforce a safety and health policy is crucial in SMEs manufacturing industries. The enforcement of safety rules in manufacturing has to done. The author suggested that OSH, SOCCSO, and even Kumpulan Wang Simpanan Pekerja (KWSP) should draft out several templates of rules and regulations in their websites and allow manufacturers to download the templates for personal used. The website should be improved by having an online or offline 'forum' for manufacturers to discuss about their safety and health issues with professional safety and health officers' guidance.

Besides that, the key Performance Indicators (KPI) usually measures on customer satisfactions, financial performance, internal process quality and employee satisfaction.

By having an indicator that focusing on workplace safety and health, it helps in reducing hazardous in the organisation. Many SMEs in manufacturing industries do not have a formal performance appraisal practice in Malaysia. From the survey of 272 respondents from SMEs manufacturing industries, only 58 SMEs (21.3%) used KPI in their workplace [28]. Without a formal appraisal method, it is hard for management to monitor company's performance and adjustment.

The researchers suggested SMEs in Malaysia manufacturing industry to have a formal performance appraisal such as KPIs, peer appraisals, etc. to monitor the working condition of the workplace. An indicator such as 'zero accident' should be included in the KPI [29]. This 'zero accident' indicator must be implemented at the operation level. 'The Donkey, Carrots and Stick' analogy is a metaphor that uses both rewards and punishment to induce a desired behaviour. With this 'zero accident' indicator, it will eventually help to reduce workplace accidents and injuries. They tend to be more careful, more focus and paying extra attention to their health and even their peer's health. They will more initiative to learn about safety and health as well as taking pre-conscious new systems or machinery in their workplace.

This study helps to enhance the knowledge of society, manufacturing employees and employers regarding safety and health policy. Manufacturers or non-manufacturers are able to understand the causes of workplace accidents and injuries and the consequences of workplace hazard. It also serves as an important guide to the human resource department regarding the contributors of reducing workplace accidents and injuries as they are able to measure a new benchmark during recruitment and selection purposes.

**Acknowledgments.** Thanks to Ministry of Higher education (MOHE) for providing funding for this research under FRGS grant, project number FRGS/1/2020/SS0/MMU/03/10.A special thanks to Professor Dr Mohamed Khan bin Jamal Khan for his knowledge contribution towards this research especially information on Safety and Health.

**Authors' Contributions.** Jian Ai Yeow wrote the overall papers and develop the theory as well as performed the write up of manuscript. Dennis Khong contributed to the findings and discussion of the work. Tee Suan Chin and Afandi Yusof contributed to the interpretation of data.

## References

1. L. Surienty, K. T. Hong, D. Kee, and M. Hung, "Occupational Safety and Health (Osh) in Smes in Malaysia : a," *J. Glob. Enterpneuesh.*, vol. 1, no. 1, pp. 65–75, 2011.
2. T. K. Fredericks, A. R. Kumar, and S. Karim, "An ergonomic evaluation of a manual metal pouring operation," *Int. J. Ind. Ergon.*, vol. 38, no. 2, pp. 182–192, 2008, doi: <https://doi.org/10.1016/j.ergon.2007.02.003>.
3. SME corporation, "SME corporation Malaysia," *Official Website of SME Corporation Malaysia*, 2022. <https://www.smecorp.gov.my/index.php/en/policies/2020-02-11-08-01-24/sme-definition> (accessed Jun. 08, 2022).
4. K. T. Hong, L. Surienty, and D. K. M. Hung, "Occupational Safety and Health (OSH) in Malaysian Small and Medium Enterprise and Effective Safety Management ...," *Int. J. Bus. Technopreneursh.*, vol. 1, no. November, pp. 321–338, 2011.
5. S. K. Wong, "Importance of safety and health regulations for all," *the New Straits Times*, 2021.



6. R. Barkan, D. Zohar, and I. Erev, "Accidents and Decision Making under Uncertainty: A Comparison of Four Models," *Organ. Behav. Hum. Decis. Process.*, vol. 74, no. 2, pp. 118–144, 1998, doi: <https://doi.org/10.1006/obhd.1998.2772>.
7. Law of Malaysia, *Occupational Safety and Health Act 1994*, no. 1990. 1994, pp. 38–59.
8. A. Onion, M. Sullivan, and M. Mullen., "History of Christmas," *history.com*, 2021. <https://search.yahoo.com/search?fr=mcafee&type=E210US91213G91522&p=google.scholar> (accessed Sep. 03, 2021).
9. T. A. Saurin, C. T. Formoso, and F. B. Cambraia, "An analysis of construction safety best practices from a cognitive systems engineering perspective," *Saf. Sci.*, 2008, doi: <https://doi.org/10.1016/j.ssci.2007.07.007>.
10. N. A. Rahlin, M. Mustafa, and A. H. A. Majid, "The estimation trend of Malaysian SME occupational safety and health statistic," *Int. J. Occup. Saf. Heal.*, vol. 6, no. 1, pp. 18–25, 2018, doi: <https://doi.org/10.3126/ijosh.v1i1.14773>.
11. Nuradzimmah Daim -, "Amendments to Employment Act 1955 to ensure safety for those working from home," *the New Straits Times*, Jan. 07, 2021.
12. Jess Bell, "WFH injuries on the rise: Why HR needs to take ergonomics seriously," *Human Resources Director*, 2020. <https://www.hcamag.com/au/specialisation/workplace-health-and-safety/wfh-injuries-on-the-rise-why-hr-needs-to-take-ergonomics-seriously/241691> (accessed Jun. 06, 2021).
13. F. M. Shamsudin, C. Subramaniam, and S. Sri Ramalu, "The influence of HR practices and job satisfaction on interpersonal deviance in the workplace," *J. Manag. Organ.*, vol. 20, no. 5, pp. 691–709, 2014, doi: <https://doi.org/10.1017/jmo.2014.50>.
14. C. Subramaniam, F. M. Shamsudin, and H. Ibrahim, "Linking human resource practices and organisational performance: Evidence from small and medium organisations in Malaysia," *J. Pengur.*, vol. 32, pp. 27–37, 2011, doi: <https://doi.org/10.17576/pengurusan-2011-32-04>.
15. DOSH, "Occupational Accident Statistics," *Department of Occupational Safety and Health, Minister of Human Resource Malaysia*, 2020. <https://www.dosh.gov.my/index.php/list-of-documents/statistics/occupational-accident-statistics> (accessed Apr. 12, 2019).
16. J. A. Yeow, M. K. B. J. Khan, and P. K. Ng, "Enforcement of safety and health policy reduces human error in SMEs in the manufacturing industry," *Adv. Sci. Lett.*, vol. 23, no. 11, pp. 10656–10659, 2017, doi: <https://doi.org/10.1166/asl.2017.10124>.
17. D. of S. Malaysia, "National Occupational Accidents Statistic 2020," *Department of Statistic Malaysia Official Portal*, 2021. [https://www.dosm.gov.my/v1/index.php?r=column/cthem ByCat&cat=492&bul\\_id=czB6elhvaWtoVmgwVktXUGJqREILZz09&menu\\_id=WjJGK0Z5bTk1ZEIVT09yUW1tRG41Zz09](https://www.dosm.gov.my/v1/index.php?r=column/cthem ByCat&cat=492&bul_id=czB6elhvaWtoVmgwVktXUGJqREILZz09&menu_id=WjJGK0Z5bTk1ZEIVT09yUW1tRG41Zz09).
18. A. Lai, "INTERACTIVE: How much are you at risk from accidents at work?," *The Star Newspaper*, Sep. 02, 2021.
19. K. S. Park and J. in Lee, "A new method for estimating human error probabilities: AHP-SLIM," *Reliab. Eng. Syst. Saf.*, vol. 93, no. 4, pp. 578–587, 2008, doi: <https://doi.org/10.1016/j.res.2007.02.003>.
20. K. Arifin, K. Aiyub, M. R. Razman, J. M. Jahi, A. Awang, and S. S. H. Hussain, "Occupational safety management in Malaysia," *Journal of Food, Agriculture and Environment*. 2013.
21. K. G. Davis, S. E. Kotowski, D. Daniel, T. Gerding, J. Naylor, and M. Syck, "The Home Office: Ergonomic Lessons From the 'New Normal,'" *Ergon. Des.*, vol. 28, no. 4, pp. 4–10, 2020, doi: <https://doi.org/10.1177/1064804620937907>.
22. V. Vaughn-Coward, "Walden University Commencement," *Dissertation*, vol. 233, no. 1, pp. 1–155, 2018, [Online]. Available: <https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=9729&context=dissertations>.
23. J. Reason, "Understanding adverse events: human factors.," *Qual. Health Care*, 1995, doi: <https://doi.org/10.1136/qshc.4.2.80>.

24. J. A. Yeow, P. K. Ng, H. T. Tai, and M. M. Chow, “a Review on Human Error in Malaysia Manufacturing Industries,” *J. Inf. Syst. Technol. Manag.*, vol. 5, no. 19, pp. 01–13, 2020, doi: <https://doi.org/10.35631/jistm.519001>.
25. Hui-Nee A., “Safety Culture in Malaysian Workplace : An Analysis of Occupational Accidents,” *Heal. Environ. J.*, 2014.
26. F. Chuah, K. Teoh, H. Ting, and E. Lau, “A behavioral approach to modelling strategy execution: The role of organizational support and the moderated mediation effect of engagement and communication,” *Int. Rev. Manag. Mark.*, vol. 6, no. 8Special Issue, pp. 217–225, 2016.
27. C. M. Felipe, J. L. Roldán, and A. L. Leal-Rodríguez, “An explanatory and predictive model for organizational agility,” *J. Bus. Res.*, vol. 69, no. 10, pp. 4624–4631, 2016, doi: <https://doi.org/10.1016/j.jbusres.2016.04.014>.
28. Dhesegaan Bala Krishnan, “WFH: Experts speak about issues to be addressed,” *the New Straits Times*, Kuala Lumpur, Oct. 23, 2020.
29. J. Santos, J. M. Sarriegi, N. Serrano, and J. M. Torres, “Using ergonomic software in non-repetitive manufacturing processes: A case study,” *Int. J. Ind. Ergon.*, vol. 37, no. 3, pp. 267–275, 2007, doi: <https://doi.org/10.1016/j.ergon.2006.10.022>.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter’s Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter’s Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

