

A ten-year review: Safety Culture and Safety Performance Studies in Malaysia

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Abstract

Safety culture or climate has been linked to safety performance in a growing number of studies. How safety and safety culture may enhance a company's safety performance has been the subject of several studies, particularly in high-risk sectors. Since safety culture is defined differently in different countries and organization in literature, it's important to have a look at some of the studies that have been conducted in the country, especially since the Malaysian OSHMP 2020 has highlighted the need for a preventive culture in every sector to promote a healthy work culture that benefits employees, employers, and the country. This ten-year review involved a database of Google Scholar to increase the likelihood of finding all related research in the country. Keywords such as "budaya keselamatan di Malaysia" (in Malay) and "Safety culture practice in Malaysia" were used to search the article. There are several criteria for choosing studies to evaluate, including (a) study in the subject of safety culture, (b), data gathered in Malaysia, and, finally, (c), papers from 2009-2019. The study design, types of industry involved, safety culture indicators selected, the influence of safety

culture and safety performance in 10 research was reviewed by researchers in the current paper. Quantitative study design, mostly conducted in a high incident manufacturing setting, proactive safety culture measure is favored among researchers in safety culture. Four articles that studied the relationship with safety performance also showed a significant relationship with safety culture indicators. However, despite the importance of this subject, the number of studies is still low, especially when it comes to qualitative design. For OSHMP2025 to accomplish its goal of instilling preventative culture in all working environments, more study is needed to understand the relationship between the factors assessed, in a variety of different Malaysian sectors.

Keywords: Safety culture, safety performance, Malaysia, ten-year review

1. Introduction

It is customary in the literature to use the terms "safety culture" and "safety climate" to characterize an organization's policies and its employees' attitudes about safety issues [1]. Safety culture and safety climate have been used interchangeably in various research studies, according to some sources. Even though researchers identified various descriptions in the literature, no one description has been agreed upon. In this sense, certain interpretations for indicators are favoured over others. Safety climate is a superficial perspective compared to safety culture. While safety climate refers to the effect of environmental and organizational factors. Safety culture is an organization's set of values, whereas climate of safety is the influence of environmental and organizational factors on these values. Safety culture, according to [2], is a key element in the new approach to enhancing safety performance. Safe work environments are created when employees are made aware of dangers and accident prevention [3]; [4]

Much study has been done on the relationship between safety culture and the safety climate, and on the influence that these factors have on outcomes related to safety, such as performance. How safety and safety culture may boost a company's performance has been the subject of several studies, especially in high-risk sectors [5, 6]. There is, however, no consensus in the literature on the concept of safety performance. According to most experts, the meaning is determined by what they have personally experienced [7]. The capacity of an organization to prevent work-related events or injuries, for example, is characterized by [8] as safety performance. As a result of their effect on safety performance, safety culture and climate have become a major concern in recent decades.

According to [9], each organization has its own set of resilient safety culture indicators that contribute to improved safety performance. In Malaysia, the Department of Occupational Safety and Health (DOSH) Malaysia compiles and manages accident reports, which allow for a reactive evaluation of safety performance in all industrial sectors. Across all sectors, the number of accident cases is increasing. When assessing safety performance, a reactive measurement like this one might be used to illustrate the concept. It is becoming increasingly vital to assess safety performance based on proactive indicators. This is because preventive may be done before an adverse incident occurs. Since it was proven in worldwide literature there is a favorable link between safety culture and safety performance, establishing safety culture indicators seems to be essential in Malaysia.

The purpose of this review study was to examine several aspects in previous studies on safety culture and safety performance in Malaysia. Hence, this review will focus to answer on several research questions as follows:

- a) What is the type of industries that have been chosen for the research of safety culture and safety performance in Malaysia?
- b) What research methods have been used to conduct research and who is the respondent involved in safety culture and safety performance in Malaysia?

c) What are the safety culture and safety performance in Malaysia indicators or factors that are being studied? What are the main findings?

2. Literature Review

A study by [6] focuses on the exploratory elements of safety culture practice in the industrial setting of Malaysian radiation facilities, especially defining the influencing factors, their reliance, and significant differences in mean level. To achieve this, the Malaysian Nuclear and Radiation Safety Tool Kit adopts and adapts the six-factor Malaysian Safety Tool Kit (MSTK) and the safety culture practices proposed by the International Atomic Energy Agency (IAEA) Safety Series (MRSTK). Using the MSTK model as a guide, a partial replication of the exploratory factor analysis was conducted in Malaysia's nuclear industry. As for the result, 32 components were created as part of a nine-factor model that included: inquiring attitude, communicative information, work environment, and management commitment; communication; safety priority; personal view; engagement; and prudent approach. Statistics show that these parameters have a statistically significant mean difference. Consequently, the results are in line with popular safety climate themes. As a result of their work, Malaysian radiation safety climate models will need to consider individual reaction and organizational culture variables.

Another study has described the significance of safety climate in Malaysia's manufacturing industry and identified elements that impact safety performance [10]. The impacts of each dimension of safety climate on safety performance in a Malaysian-based electric and electronic manufacturing facility are being investigated. The study was conducted as a non-experimental form of research with a questionnaire as the data collection technique. The study included 313 production workers from a Malaysian electric and electronic manufacturing plant. Simple linear regression analysis was used to examine the acquired data. The study's findings revealed that each component of safety climate had a substantial impact on safety performance. This study also reflected another find [11] that found modifying behavior and safe behavior encouragement is the key element of a good safety program. The researcher's definition of safety culture was based on behavioral variables that shown a variety of behaviors as pieces of the puzzle that builds the cognitive construct of organizational culture. As a result, the research investigates the behavioral elements of safety culture in Malaysian construction firms. The study's sample was drawn from the whole population of Grade 7 registered contractors; however, it was restricted to building contractors in the Klang Valley area. The questionnaire survey technique highlighted leadership, organizational commitment, management commitment, safety training, and resource allocation as activities that embed safety culture in organizational culture. A balanced focus on the behavioral components of safety culture, with an equal number of elements receiving mean scores surpassing and below the median score, was discovered to be currently practiced among Malaysian construction businesses.

There was another study also conducted in Malaysian manufacturing industry by [12]. The manufacturing sector was chosen since it is one of the riskiest sectors in the world. Because of the rising frequency of workplace accidents, workplace safety remains a topic of attention in the industrial business. The increased frequency of workplace accidents in this business has raised the question of whether companies are taking adequate care of their employees' safety and health to increase production. The purpose of this research is to see if there is a substantial difference between individual variables and factory employees' perceptions of safety culture. Respondents were manufacturing industry employees in Peninsular Malaysia. This investigation was conducted using a quantitative approach. IBM-SPSS Statistics was used to examine the data. The results of this study indicated that diverse individual elements play a crucial role in developing workplace safety culture. Individuals who are directly or

indirectly impacted by an injury at work should be held liable. Everyone in the workplace, including employers, employees, their families, and the government, must be involved in occupational safety and health (OSH) to achieve an improved preventive and treatment.

Corporate safety culture has been the main focus of the study by [13]. This is because corporate safety culture is now widely acknowledged as having a significant impact on workplace accidents and injuries. There has been an improvement in workplace safety since the adoption of Occupational Safety and Health (OSH) in the business. However, certain incidents of accidents have been recorded even after the organization's management gave training, implemented tougher safety rules and regulations, and provided adequate equipment to employees. As a result, the study was conducted to investigate the impact of employees' attitudes and subjective norms regarding safety culture behavior in organizations. Flextronics Penang Sdn Bhd, a firm in the northern portion of Malaysia, was the site of data gathering for the study. Operators (90 respondents), technicians (52 respondents), and engineers (27 respondents) have completed 196 survey questions. Participants' attitudes and subjective norms had a substantial impact on safety culture behavior, based on the study's findings. Employees are being encouraged to adopt safer behaviors based on the findings of this study. The study also advised that future research in the same field bring management commitment, leadership, safety education, and training under evaluation to understand its link with employee safety culture behavior.

Small and medium manufacturing sectors have also been chosen for safety culture study in Malaysia [14]. In the study, researchers incorporated culture practices as a new criterion in order to reduce the percentage of workplace accidents. Four components, namely self-regulation, top management commitment, enforcement & promotion, and safety culture, will be investigated to see how they impact the improvement of decreasing accident cases in the workplace. A ten-month accident data set from a manufacturing sector was collected and examined in terms of cultural practice. According to the findings of the investigation, having a strong understanding, dedication, practices, and conduct will minimize the number of workplace accidents. The study also highlighted the issues of accident cases in Malaysian workplaces in the industrial sector, which are most likely related to a lack of safety culture and non-compliance with the provisions of the Occupational Safety and Health Act (OSHA) of 1994. This study supports occupational safety and health (OSH) in the Malaysian manufacturing sector using a variety of management techniques such as training and safety management, self-regulation knowledge, enforcement, and promotion.

Another interesting study that incorporated ergonomic factor and safety culture was studied in Malaysia manufacturing industries [15]. The study highlighted critical elements that may be used to link ergonomics knowledge and safety culture. These components can be utilized to aid study into the variables that impact ergonomics awareness and the link with safety culture in a company. A study of 108 Safety and Health (SH) practitioners in Malaysian manufacturing companies was conducted. Exploratory Factor Analysis was used to investigate SH practitioners' opinions of the relevance of ergonomics in the workplace, as well as their ideas about the necessity of instilling a safety culture in their organizations. After EFA, 20 ergonomics-related factors were determined as being of high relevance at the workplace. The factors were implication and improvement, workplace appropriateness for employees, and ergonomics' basic consideration. SH practitioners' opinions of the relevance of safety climate were the subject of questions created to gauge their perceptions about safety climate. A total of 17 elements were used to develop three construct models, which included commitment and leadership (7 items), motivation (6 items), and safety management system practice (3 items) (4 items). An in-depth examination of how SH practitioners' opinions of ergonomics' relevance in the workplace impact safety culture are warranted considering this conclusion.

[16] investigated the effectiveness of management strategies in safety culture in decreasing workplace injuries. Management practices have an essential role in determining an organization's safety climate. The research was carried out in Malaysia's leading industrial zone. In this study, management techniques such as reward, training, management commitment, communication, and feedback, recruiting procedures, and employee participation were investigated. This study included 68 firms; the injury data supplied by the companies spanned three years, and 24 musculoskeletal injuries were investigated. A strong linear connection was found between the subscale of management methods and injury rates. Injury rates are reduced via rewards, managerial commitment, feedback, and selection. The injury rates, on the other hand, were strongly predicted by only feedback and employee engagement. Injury rates do drop when appropriate management techniques are implemented.

Another study, adding to the field of knowledge on safety culture, investigated the extent to which variables determine safety culture in the education sector. A study was performed at Vocational Colleges (VC) throughout Malaysia, as one of the technical and vocational institutions in the Malaysian education system, with 380 teachers teaching engineering technology courses at VC [17]. In this study, partial least squares (PLS) analysis was used to evaluate the research hypothesis. The measuring methodology yielded five safety culture variables, the validity, and reliability of which were validated. Succeeding safety legislation, safety training, and safety communication, safety knowledge emerged as the most significant predictor in the structural model's study of safety culture. Instructors' managerial commitment to safety culture, on the other hand, had no meaningful impact. There was also a study conducted in Malaysia university by [7]. Staff members at a government university institution in Malaysia were asked to rate their level of knowledge, attitude, and practice (KAP) about safety culture and its associated variables. Prior to the main investigation, a cross-sectional study was done over the course of one month (July 2016) to pre-test the modified safety attitude questionnaire. Safety culture knowledge, attitude, and practice were shown to be lower in this study than in prior studies conducted in an academic setting. There is a need for employee training on safety culture to increase their awareness and knowledge of safety culture.

3. Research Methodology

This study used a meta-analysis design, which is a secondary research method that identifies, investigates, and interprets all relevant papers linked to a topic domain [18]. One database, Google Scholar, was used to restrict the area of prior research on Malaysian safety culture. This database was chosen because it increases the likelihood of discovering relevant material. Keywords such as "budaya keselamatan di Malaysia" (in Malay) and "Safety culture practice in Malaysia" were used to search the article. There are several criteria for choosing studies to evaluate, including (a) study in the subject of safety culture, (b), data gathered in Malaysia, and, finally, (c), papers from 2009-2019. In the end, 10 articles satisfied the requirements.

4. Findings

4.1 Type of industries that have been chosen for Malaysia safety culture and safety performance studies

Table 1

Type of industrial sectors

Industry	Frequency (%)	Studies
Manufacturing	6 (60)	[12-16, 19, 20]
Construction	1 (10)	[11]
Education	2 (20)	[17]
Radiation	1 (10)	[6]

Most of the safety culture and safety performance study conducted in Malaysia was in the manufacturing-based industry with 60% in percentage. This is also including the small and medium manufacturing industries. Besides that, safety culture and safety performance studies also were conducted in the tertiary education sector with 20%, construction 10% and radiation facility with 10%.

4.2 Research methods have been used to conduct research and respondents involved in Malaysia safety culture and safety performance studies

Table 2

Method selection and target respondent

Methodology	Frequency (%)	Respondent	Studies
Quantitative	9 (90)	Safety and Health Practitioners	[15]
		Teaching & Non-teaching Staff/Instructor	[17, 21]
		Production employees	[12, 13, 22]
		Industrial radiation workers	[6]
		Physicians	[16]
Triangulation	1 (10)	Grade 7 registered contractors	[11]
		Secondary data analysis	[23]
Qualitative	0 (0)		
Mix Method	0 (0)		

Almost all (90%) of the safety culture and safety performance rely on a quantitative study design. Only one study for the small and medium manufacturing industry used a triangulation method that involved different materials and different types of data sources from secondary research. There is no safety culture and safety performance study that used qualitative or mixed method study design. Respondent-wise, most studies involved production employees, two were assigning educators, and two others involving safety practitioners and physicians. Only one study involving radiation workers and another one involving registered contractors.

4.3 Selected indicators and main findings from the study in Malaysia safety culture and safety performance studies

Table 3

Safety culture indicator and main finding

Studies	Safety culture or safety climate indicator or element	Relationship with safety performance	Main findings
[15]	Commitment and leadership Safety Management Practice Motivation	-	Identified three principal elements on ergonomics awareness that have significant impact on safety culture
[17]	Management commitment Safety communication Safety training Safety rule Safety knowledge	-	Identified five safety culture indicators
[23]	Self-regulation Top management commitment Enforcement Promotion Culture improvement	-	Identified safety culture practice to upgrade OSH management system
[13]	Employee's attitude Subjective norm	Positive	Identified that safety performance measure (safety behaviour) is significantly influenced by employee's attitude and subjective norm
[23]	Top management commitment Management commitment Employee commitment Perceived risk Emergency response	Positive	Identified five safety climate indicators were important predictors of safety performance
[12]	Training and education Management commitment Employee involvement Safety compliance	-	Identified four safety culture indicators
[6]	Management & Communication Personal involvement in safety Personal view Supportive environment Work environment Questioning attitude Communicative information Prudent approach	Positive	Identified that the perceptions of safety climate factors tend to influence the risk estimate
[16]	Hiring practices Management commitment Employee participation Reward Training Communication and feedback	Positive	Identified management's indicator in safety culture that is essential in reducing injury rates at the workplace
[11]	Leadership Organizational commitment Management commitment Training Resource allocation	-	Identified safety culture indicator that embedded in organizational culture
[24]	Length of service Attitudes toward safety Age with practice	-	Identified predictor factors to knowledge, attitude, and practice of safety culture

Based on table 3 above, most of safety culture studies conducted have not studied the relationship or the impact of safety culture to safety performance. All six of the studies have identified factors or indicators of safety culture and among them, there is one study embedded the factor to organizational culture and one study identified the safety culture practice that can enhance safety management system. Nevertheless, findings also showed there were four studies that find the relationship of those safety culture indicators to safety performance. All of the four studies showed significant positive relationship with the studied safety performance measures.

5. Discussion and Conclusion

Based on the study finding on the first research questions, majority (60%) of safety culture and safety performance study in Malaysia have been conducted in manufacturing sector. Some chose to conduct in education sector and one in construction and radiation facility. This can be explained based on the risk related to the nature of that industry. Based on DOSH Malaysia incident report from 2017 to 2019, there is an increasing trend in reported incident highest in the manufacturing industry as compared to other types of industry. Hence, the issue is critical in manufacturing industry that attracted researcher to conduct their study in the manufacturing sectors. Previous research also proved that manufacturing industries employees exposed to many types of hazards during working. Workers working in the production area will be exposed to several occupational hazards such as ventilation, heat, chemicals, and noise due to the operation of machines used throughout the manufacturing process[19, 25-28]. Construction sector also shown an alarming incident number reported. However, based on this review, only one study was conducted in construction industry. This is due to the restriction to the construction site that cause a limitation to researcher in conducting research in construction area for safety reason of the visitor that is not familiar with the work process and the nature of that construction industry which is risky to their safety and wellbeing[29].

From the second research question, it was clearly shown that past studies in Malaysia that involving safety culture and safety performance were conducted using quantitative study design. Most of the researcher (90%) adopting validated questionnaire or self-constructed the questionnaire followed by instrument validation process. Using a validated questionnaire such as gave an advantage to the researcher because a quality data may be collected with a valid questionnaire, resulting in less work and more reliable results. They don't need to be verified for reliability, and the findings may be compared across studies and pooled for meta-analysis, saving time and money. However, it is important to ensure that the questionnaire is administered in a comparable way to the original version[30]. Thus, the lack of qualitative or mix method study design in safety culture and safety performance is in demand. This is because, while quantitative research may assist produce more accurate answers and simplify complexity, qualitative research is essential for its potential to give different information via a better understanding of complexity, especially that of human behaviour and perception in safety culture that may impact on safety performance in an organization. Respondent that has been selected for the study also quite limited to high incident industry (manufacturing) employees. Thus, future research should expand the target respondent to other industries as well. This is to support the Malaysia OSHMP 2020 that emphasised the need for a preventive culture in every sector to instil a safe and healthy work culture for the well-being of employees, employers, and the country[31]. There are still early phases to this activity, especially in the non-factory sector, such as in government or regulatory agencies.

The last question for this review involving the safety culture and safety performance in Malaysia indicators or factors that being studied, and what are the main findings

from the research undertaken. Most of the studies stopped at identifying the feasible indicators for their target organization (60%) and four of the studies extended to finding the relationship with safety performance. Based on the findings, different nature of industry will slightly had a different set of safety culture indicators. Yet, common indicator found to be the management commitment found in 90% of the studies and employees' participation or commitment and attitude in 60% of the studies. This can be explained with nearly all safety culture frameworks clearly include management commitment to safety. Hence, the role of leadership in building a strong safety culture is evident. Attitudes and behaviours that put safety first should be modelled by leaders at all levels of an organisation Following the examples of their leaders, employees learn what is expected of them in a company. Personnel with a strong sense of personal responsibility take a greater interest in safety and are more inclined to speak out when others behave in a hazardous manner. Personal accountability empowers individuals and aids the whole business in identifying and resolving potential problems. This common indicators also shared in other countries too [11, 18, 20, 24, 29, 31-35]. A systematic review by [25] supported these findings where it is challenging to standardise the concept because of the diversity of safety culture definitions and the process of the organisation that is different from one another. Due to the variation, future studies are welcome to expand to many other industry or organization to identify the feasible indicator for their different types of organization. Likewise for Malaysia, to accomplish OSHMP2025 goal of instilling preventative culture in all working environments, more study is needed to understand the relationship between the factors assessed, in a variety of different Malaysian sectors.

Limitation

This study has a limitation whereby only articles in year 2009 to 2019 were selected and from one database namely Google Scholar. Despite doing a thorough literature search using broad keywords, we were unable to rule out the possibility of missing some relevant papers.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

Author contributions

ISNA conceptualized this study, reviewed the literature, assessed the literature quality, and drafted the article. NN, NDMI, JMJ, and SA proposed an article outline, reviewed the literature, and assessed the literature quality. ZI, and SMY revised and polished the article. All authors contributed to the article and approved the submitted version.

Reference

1. Nordin, M.N.B., M.Z.B. Mustafa, and A. Razzaq, *Relationship between headmasters' leadership, task load on special education integration programme teachers' job satisfaction*. Universal Journal of Educational Research, 2020. **8**(8): p. 3398-3405. DOI: <https://doi.org/10.13189/ujer.2020.080813>.
2. Choudhry, R.M., D. Fang, and S. Mohamed, *The nature of safety culture: A survey of the state-of-the-art*. Safety science, 2007. **45**(10): p. 993-1012.
3. Fu, T., et al., *Aberrantly elevated microRNA-34a in obesity attenuates hepatic responses to FGF19 by targeting a membrane coreceptor β -Klotho*. Proceedings of the National Academy of Sciences, 2012. **109**(40): p. 16137-16142.

4. Zin, S.M. and F. Ismail, *Employers' behavioural safety compliance factors toward occupational, safety and health improvement in the construction industry*. Procedia-Social and Behavioral Sciences, 2012. **36**: p. 742-751.
5. Cox, S.J. and A.J.T. Cheyne, *Assessing safety culture in offshore environments*. Safety science, 2000. **34**(1-3): p. 111-129.
6. Kasim, H., et al., *The relationship of safety climate factors, decision making attitude, risk control, and risk estimate in Malaysian radiation facilities*. Safety science, 2019. **113**: p. 180-191. DOI: <https://doi.org/10.1016/j.ssci.2018.11.025>.
7. Liu, Y.J., et al., *Evaluation of safety performance in process industries*. Process Safety Progress, 2014. **33**(2): p. 166-171.
8. de Koster, R.B.M., D. Stam, and B.M. Balk, *Accidents happen: The influence of safety-specific transformational leadership, safety consciousness, and hazard reducing systems on warehouse accidents*. Journal of Operations management, 2011. **29**(7-8): p. 753-765.
9. Beus, J.M., et al., *Safety climate and injuries: an examination of theoretical and empirical relationships*. Journal of applied psychology, 2010. **95**(4): p. 713.
10. Jusoh, N.H.M. and S.A. Panatik, *The effects of safety climate on safety performance: an evidence in a Malaysian-based electric electronic and manufacturing plant*. Sains Humanika, 2016. **8**(4-2).
11. Ismara, K.I., et al., *Relationship model for occupational safety and health climate to prevent needlestick injuries for nurses*. Kesmas: Jurnal Kesehatan Masyarakat Nasional (National Public Health Journal), 2019. **13**(3): p. 144-149. DOI: <https://doi.org/10.21109/kesmas.v13i3.1989>.
12. Amirah, N.A., et al., *Relationship Between Behavioral Aspects and Safety Culture in the Peninsular Malaysia Manufacturing Industry*. World Applied Sciences Journal, 2017. **35**(9): p. 1880-1884.
13. Abdullah, M.S., et al., *Safety culture behaviour in electronics manufacturing sector (EMS) in Malaysia: The case of flextronics*. Procedia economics and finance, 2016. **35**: p. 454-461.
14. Khoo, N.K., H. Hussin, and N. Abdullah, *managing occupational safety and health (OSH) culture practices at small and medium (S&M) Malaysia manufacturing sector*. Journal of Human Capital Development (JHCD), 2018. **11**(1): p. 79-90.
15. Rozlina, M.S., et al. *Perceptions of ergonomics importance at workplace and safety culture amongst safety & health (SH) practitioners in Malaysia*. Citeseer.
16. Ali, H., N.A.C. Abdullah, and C. Subramaniam, *Management practice in safety culture and its influence on workplace injury: An industrial study in Malaysia*. Disaster Prevention and Management: An International Journal, 18(5), 470-477., 2009. DOI: <https://doi.org/10.1108/09653560911003660>.
17. Makhtar, N.B., et al., *Investigating technical instructors perceptions of safety culture using Partial Least Square-Structural Equation Modelling (PLS-SEM) in Malaysian Education Sector*. International Journal of Creative Future and Heritage, 2018: p. 148-168. DOI: <https://doi.org/10.47252/teniat.v6i1.181>.
18. Webster, J. and R.T. Watson, *Analyzing the past to prepare for the future: Writing a literature review*. MIS quarterly, 2002: p. xiii-xxiii.
19. Ali, D., Y. Yusof, and A. Adam. *Safety culture and issue in the malaysian manufacturing sector*. EDP Sciences. DOI: <https://doi.org/10.1051/mateconf/201713500031>.
20. Mashi, M.S., C. Subramaniam, and J. Johari, *The effect of management commitment, safety rules and procedure and safety promotion policies on nurses safety performance: The moderating role of consideration of future safety consequences*. International Business Management, 2017. **11**(2): p. 478-489. DOI: <https://doi.org/10.1080/09585192.2018.1454491>.
21. Grosskopf, S., D. Margaritis, and V. Valdmanis, *Comparing teaching and non-teaching hospitals: a frontier approach (teaching vs. non-teaching hospitals)*. Health Care Management Science, 2001. **4**(2): p. 83-90.
22. Amirah, N.A., et al., *Safety culture in combating occupational safety and health problems in the Malaysian manufacturing sectors*. Asian Social Science, 2013. **9**(3): p. 182. DOI: <https://doi.org/10.5539/ass.v9n3p182>.
23. Kah, M., et al., *A critical evaluation of nanopesticides and nanofertilizers against their conventional analogues*. Nature nanotechnology, 2018. **13**(8): p. 677-684.
24. Isaak, V., et al., *Enhancing the safety climate and reducing violence against staff in closed hospital wards*. Workplace Health & Safety, 2017. **65**(9): p. 409-416. DOI: <https://doi.org/10.1177/2165079916672478>.
25. Cooper, M.D., *Towards a model of safety culture*. Safety science, 2000. **36**(2): p. 111-136.
26. Kokangül, A., U. Polat, and C. Dağsuyu, *A new approximation for risk assessment using the AHP and Fine Kinney methodologies*. Safety science, 2017. **91**: p. 24-32. DOI: <https://doi.org/10.1016/j.ssci.2016.07.015>.

27. Nielsen, K.J., et al., *Changes in safety climate and accidents at two identical manufacturing plants*. Safety Science, 2008. **46**(3): p. 440-449. DOI: <https://doi.org/10.1016/j.ssci.2007.05.009>.
28. Rampal, K.G. and J.M. Nizam, *Developing regulations for occupational exposures to health hazards in Malaysia*. Regulatory Toxicology and Pharmacology, 2006. **46**(2): p. 131-135. DOI: <https://doi.org/10.1016/j.yrtph.2006.01.013>.
29. Quach, E.D., et al., *Safety climate associated with adverse events in nursing homes: A national VA study*. Journal of the American Medical Directors Association, 2021. **22**(2): p. 388-392. DOI: <https://doi.org/10.1016/j.jamda.2020.05.028>.
30. Edwards, P., *Questionnaires in clinical trials: guidelines for optimal design and administration*. Trials, 2010. **11**(1): p. 1-8. DOI: <https://doi.org/10.1186/1745-6215-11-2>.
31. Rasul, M.S., et al., *Transforming TVET in Malaysia: Harmonizing the governance structure in a multiple stakeholder setting*. The Online Journal for Technical and Vocational Education and Training in Asia, 2015(4): p. 1-12.
32. Ashour, A. and Z. Hassan, *A Conceptual Framework for Improving Safety Performance by Safety Management practices to Protect Jordanian Nurses During the Coronavirus Outbreak (COVID-19) in 2020, 1-10*.
33. Ghasemi, F., et al., *Analysis of occupational accidents among nurses working in hospitals based on safety climate and safety performance: a Bayesian network analysis*. International journal of occupational safety and ergonomics, 2020: p. 1-7. DOI: <https://doi.org/10.1080/10803548.2020.1768759>.
34. Odu, J.O., H.T. Rahmawati, and J. Juliana, *Safety culture among the staff at a public university in Malaysia*. International Journal of Public Health and Clinical Sciences, 2018. **5**(4): p. 191-174.
35. Uzuntarla, F., S. Kucukali, and Y. Uzuntarla, *An analysis on the relationship between safety awareness and safety behaviors of healthcare professionals, Ankara/Turkey*. Journal of Occupational Health, 2020. **62**(1): p. e12129. DOI: <https://doi.org/10.1002/1348-9585.12129>.