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A Scoping Review on the Influence of Safety Culture and Safety Communication on Safety Performance among Employees at Construction Sites in the Middle East

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Abstract

The study strives to investigate the influence of safety culture and safety communication on safety performance among construction site employees in the Middle East through utilisation of scoping review and theme analysis. The objective of this scoping review is to thoroughly analyse and combine the current body of literature by applying certain criteria to include or exclude relevant sources. A comprehensive search was performed on various primary indexing databases, including Scopus and Google Scholar, as well as several other journal databases such as ProQuest, STARS, and ScienceDirect. The search technique utilised a mixture of keywords pertaining to safety culture, safety communication, safety performance, construction, and associated terminology. The inclusion criteria consisted of peer-reviewed articles and thesis studies that specifically examined the impact of safety culture and communication on safety performance in construction sites located in the Middle East. This scoping review is conducted in two separate cycles to gather scoping results from two distinct variable relationships: safety culture and safety performance, as well as safety communication and safety performance.

Keyword: Scoping Review, Safety Culture, Safety Communication, Safety Performance

Introduction

The construction sector is a critical industry that significantly contributes to and improves the prosperity of any nation (Alkhard, 2016). Particularly in Middle Eastern countries, construction remains a significant generator of progress and growth in this age of development, as it is a flourishing industry undergoing substantial development and growth. The construction sector is vital to the economies of the GCC countries—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates—due to its contributions to employment creation, innovation promotion, economic expansion, and investment

attraction. Nevertheless, the construction industry has a poor safety record due to the multitude of hazards that exist on construction sites (Mosly, 2015).

Consequently, academics have initiated inquiries into the relationship between construction safety and performance in the GCC regions with the aim of improving building safety records and consequently mitigating construction site accidents and injuries. Safety performance in the construction industry is typically impacted by two fundamental aspects: safety culture and safety communication. Safety culture, encompassing collective values and attitudes, is of paramount importance in reducing fatalities and accidents on construction sites. On the other hand, safety communication cultivates an atmosphere where personnel are at ease invoicing safety concerns, thereby facilitating timely identification of hazards and implementation of preventative measures.

Despite the considerable amount of research that has been conducted to examine the influence of safety culture and safety communication on construction site safety worldwide, there is still a notable dearth of studies that specifically concentrate on countries in the Middle East. The assertion is supported by the findings derived from scoping review investigations conducted on Google Scholar and Scopus databases, which indicate that there is a minimal number of scoping review results examining the interconnections and impacts of safety communication and safety culture on safety performance. Using a scoping review and thematic analysis, this study investigates the influence of safety culture and safety communication on safety performance of employees on Middle Eastern construction sites.

By placing an emphasis on safety communication and safety culture, this study's scoping review framework will assist in filling the knowledge vacuum concerning the safety performance of Middle Eastern construction site employees. Furthermore, this research can provide justification for a limited number of studies, specifically eight, which have examined the correlation or impact of safety culture on safety performance. Plus, only five studies have investigated this relationship or influence from 2013 to the present. In addition, by mapping the extant literature, these scoping review methods aid in the identification of areas that necessitate additional research. This facilitates the identification of precise research deficiencies and domains in which subsequent investigations may enhance the body of knowledge within the field. Thus, this scoping review study aims to examine safe culture influence on safety performance among employees at the construction sites in the Middle East and the influence of safety communication on safety performance among employees at the construction sites in the Middle East.

Literature Review

Conceptualising of Safety Performance

Researchers have developed numerous definitions of safety performance. According to Yuen et al. (2018), safety performance is defined as colleague support and management dedication to organisational safety through direct and indirect job engagement. Occupational engagement improves individual safety performance by capturing human behaviour. Effective safety performance can be accomplished through the use of active, calibrated employee engagement practices. In the meantime, Bunner et al. (2018) described safety performance as the level of work intensification predicted by two types of negative consequence: individual level (work pressure) and environmental condition. Alternately,

Abuashour and Hassan (2019), classified safety performance as an organisation's efforts and practises to continuously reduce accidents, injuries, and fatalities, and to improve employees' safety-related behaviours. Naji et al. (2022) defined safety performance as the safety quality of an occupation in which the organisation's safety performance can be modified to increase its robustness or resistance and decrease accident risk.

Moreover, safety performance is one of the most crucial factors for gaining a competitive advantage in today's rapidly globalising world. Organisations are encouraged to implement effective safety measures in order to reduce occupational accidents. Along with that, Syed-Yahya et al. (2022), examined safety performance as an organisational performance in terms of safety, arguing that inadequate organisational safety performance would result in financial burdens and collateral harm to the organisation and its employees. In this most recent conceptualization of safety performance, it is further defined as the incorporation of appropriate investments in safety strategies, processes, and activities for the advantage of the operator and society (Ofori et al., 2023).

Conceptualising the Safety Culture

In general, safety culture refers to a safety attitude and behaviour within an organisation, with various organisations employing distinct safety methods in accordance with their respective safety strategies. Typically, the safety culture of an organisation will influence its safety performance. Numerous researchers have investigated safety culture using diverse methodologies, resulting in a variety of unique perspectives. In line with this, Hajmohammad and Vachon (2013), proposed a safety culture in which managers prioritise safety, employees adhere to safety standards, and employees participate in the establishment and improvement of safety procedures. Along with that, Curcuruto and Griffin (2023) argued that safety culture consists of underlying assumptions and values that govern organisational behaviour rather than the direct perceptions of individuals.

Moreover, according to Ali et al. (2017), safety culture is an action that directs workers to comprehend the significance of a safe working environment by fostering belongingness, trust, and participation through cohesiveness and membership. Kartikawati and Djunaidi (2018) asserted that safety culture could be regarded not only as productivity performance but also as a business competition. In other contexts, safety culture has been described as a crucial factor in establishing a healthy and safe working environment, in addition to playing a crucial role in supplying and enhancing company business. In the subsequent three years, Naji et al. (2022) conceptualised safety culture as a common setting for determining the underlying and fundamental causes of incidents. Following that, in recent years, safety culture has been conceptualised as a combination of committed supervisors and employees, implementation of training, and mature communication.

Conceptualising the Safety Communication

Generally, safety communication is the process of communicating something related to hazards and risks that is commonly discussed in the workplace with the purpose of controlling and reducing accidents. There are a variety of perceptions of safety communication described by the researchers. According to Liao et al. (2014) safety communication is defined as a grasp of the relationship between group communication and individual cognitive issues regarding hazardous workplace behaviours. Meanwhile, Johari et al. (2017) described safety

communication as employees' perceptions towards supervisors' and safety officers' ability to convey safety information as well as respond to safety complaints.

Furthermore, in other views, safety communication is defined as the workplace characteristics that encourage open and frequent safety information exchange for significant benefits (Pandit et al., 2019). In 2022, Naji et al. suggested that safety communication methods not only enhance working conditions but also have a positive impact on employee's behaviours and attitudes toward safety leading toward reduced incidents in the workplace environment. Following that, Curcuruto and Griffin (2023) came up with the safety communication perspective as multiple independent behaviours with distinct supervisory effects that are influenced by different supervisory actions.

Method

Scoping reviews are conducted when the literature has not been exhaustively examined, or when it is so vast, heterogeneous, or complex that a systematic review is not feasible. In contrast to a systematic review, a scoping review offers a comprehensive synopsis of the current state of the research endeavour without assessing its quality. The scoping review method is appropriate for this study as it aims to investigate the correlation between safety performance and safety communication and safety culture on construction sites in the Middle East.

The research was conducted by identifying research questions, identifying pertinent studies, selecting studies, charting data, and accumulating, summarising, and reporting findings are the five phases of this methodology. The data are then categorised and analysed using thematic analysis in the subsequent phase. The research question formulated in this study, as follows, served as guidance to the scoping review: Does safety culture and safety communication give an influence on safety performance among employees at construction sites in the middle east.

Search Strategy

The systematic searching strategies comprised three distinct phases: identification, filtering, and eligibility. The researcher conducted a comprehensive scoping review via emphasizing exclusion and inclusion criteria. Basically, inclusion and exclusion criteria are predefined criteria that researchers use to determine which studies or sources will be included in or excluded from the review.

The inclusion criteria include articles published between 2013 and 2023. It was conducted using two primary indexing databases; Scopus and Google Scholar, in addition to a number of journal databases, including ProQuest, STARS, and ScienceDirect. The search involved only full text peer-reviewed articles and theses, as well as restricted to English language articles.

Identification

The initial stage was executed to enhance the keyword set utilized during the search procedure. In order to mitigate retrieval bias, it was critical to employ a variety of databases and keywords at this juncture (Durach et al., 2017). A comprehensive review of the articles was conducted using two primary indexing databases, Scopus and Google Scholar, in addition

to a number of journal databases, including ProQuest, STARS, and ScienceDirect. The investigation spanned from July to December of 2023. The search was conducted using construction sites and safety performance, safety culture, or safety communication as its primary keywords. Phrasal-level search and the fundamental operations of the Boolean operators OR and AND were utilised whenever feasible.

The keywords that have been implemented for this string search are ("safety culture" AND "safety performance" AND "construction" AND "workers" OR "employees" AND "middle east"). This effort had retrieved 833 potential articles. However, there were 16 duplicate articles found resulting in only 817 potential articles left to screen.

Other keywords that have been implemented for this string search are ("safety communication" AND "safety performance" AND "construction" AND "workers" OR "employees" AND "middle east"). This effort had retrieved 192 potential articles. However, there were 16 duplicate articles found resulting in only 176 potential articles left to screen.

Article Screening

Screening was the second process of the systematic search strategies, which distinguished suitable articles from unsuitable ones for the review. Budgen et al. (2007) emphasised that any criteria can be selected by the authors as long as the criteria can address the research question. The articles for the both parts were specifically selected amongst those construction sites in the Middle East as well as published from the previous 10 years, 2013 to 2023, and only peer-reviewed and thesis articles/documents were selected to assure the quality of articles. As prescribed by Linares-Espinos et al., (2018), only articles published in the English language were reviewed to avoid confusion, minimise cost, and reduce time consumption.

In addressing research question 1, after discarding 421 articles that had failed to meet the criteria, only 396 articles were retained for the next stage of selection. From the screening, 188 articles were detected not from the range year 2013 to 2023. 228 articles were scanned, not peer-reviewed and thesis articles. 5 articles missing. In addressing research question 2, 105 articles were retained for the next stage of selection as 71 articles had been discarded due to having failed to meet the criteria. 33 articles were cancelled as not from the range year 2013 to 2023. 36 articles were scanned, not peer-reviewed and thesis articles. 2 articles missing.

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Besides that, 105 articles were retained for the next stage of selection as 71 articles had been discarded due to having failed to meet the criteria. 33 articles were cancelled as not from the range year 2013 to 2023. 36 articles were scanned, not peer-reviewed and thesis articles. 2 articles missing.

At this stage, the abstracts were read to determine the suitability of the articles. The full article was skimmed if the article suitability was not clearly conveyed in the title. In the third process, which refers to eligibility, the selected 501 articles from both parts were re-examined to ascertain adherence to the selection criteria. As a result, in part A, 388 articles were excluded as they deviated from safety culture and safety performance at construction sites in the Middle East resulting only 8 articles were finally selected for the delve review. In part B, 100 articles were excluded resulting only 8 articles were finally considered as the eligible articles.

Results

Safety Culture and Safety Performance of Construction Sites in Middle East Countries

The study included papers on safety culture and safety performance. An initial search found 833 articles, and finally, 8 articles that met the inclusion criteria were analysed. Through the results of the scoping review and a thematic analysis, we classified the relationship between safety culture and safety performance into five themes: the significance of positive relationships, unified research objectives, uniform research methodological, specific level of employees, and country thematic focus.

The significance of positive relationship

There is a consistent positive association among the articles, indicating a recurrent acknowledgment of the positive relationship between safety performance and safety culture on construction sites. Chan et al. (2023) acknowledged a strong relationship between safety culture and performance in the Iranian urban construction sector, stating that cultivating a good safety culture is critical for enhanced safety performance. Furthermore, Alrehaili (2023) highlights the relevance of safety culture in organisational culture as well as its considerable influence on enhancing safety motivation and construction performance.

Unified Study Objectives

The majority of articles that have been analysed have the same goal of enhancing construction site safety performance. For example, Alrehaili (2016) states that the study's objective was to enhance safety performance and practices in the Saudi construction sector by utilising quantitative data gathering to analyse various elements that impact safety. Maliha et.al (2021) conducts this research to determine and categorise the obstacles to safety implementation in projects and strategies for enhancing safety performance. Additionally, Moosa (2018) investigates how safety culture affects safety performance in order to enhance safety performance and procedures in the Saudi construction sector. This is done by analysing various safety-influencing elements through the collection of quantitative data and the development of a systems-based model. In order to enhance the management of health and safety in Saudi Arabian oil and gas construction projects, Alamri (2019) conducts a critical investigation into health and safety-related concerns in construction projects.

Uniform Research Methodological

Based on thematic analysis, there are various types of methods that have been implemented by the researchers in studying the relationship between safety culture and safety performance, including quantitative analysis, mixed-method analysis, and a heavy review. However, most of them are approaching the same research design, which is a quantitative survey method. As an example, according to Alkhard (2016), a survey method was conducted among construction workers and managers at seven large construction sites across different cities to gather data on demographic characteristics and perceptions of safety culture dimensions. Other than that, according to the Alrehaili (2016) study, a quantitative survey was used to collect demographic and safety culture data from over 400 construction personnel who are currently working as middle managers in government mega construction projects in Saudi Arabia. The same goes for Khawam (2017), which conducted a quantitative correlational survey and collected demographic data from 109 engineers and first-line supervisors who worked on 23 construction projects. Moosa (2018) also conducted the same method, where a 276-question survey was distributed among various construction industry groups in Saudi Arabia, including online workers in Jeddah city and over 100 organisations. Lastly, Chan et al. conducted a Delphi survey (questionnaires) with 17 experts engaged in construction site safety management.

Specific Level of Employees

Most of the study from the eight articles studied among managers and workers. It can be proven by this clarification. Alrehaili's study (2016), which was conducted among 400 construction personnel who are currently working as middle managers in government mega construction projects in Saudi Arabia. Along with that, Moosa (2018) study was conducted among various construction industry groups in Saudi Arabia, including online workers in Jeddah city and over 100 organisations. Next, Kashwani (2017) conducted a study among 42 managers, and 313 labourers in UAE oil and gas construction projects.

Country Thematic Focus

From the thematic analysis, it can be concluded the relationship of safety culture on safety performance among workers at construction sites in the Middle East has commonly been studied in Saudi Arabia. From the eight articles, there are 5 articles that have been conducted in Saudi Arabia while one article conducted in Iran, one article in UAE and the other one is general.

Safety Communication and Safety Performance

Papers related to safety communication and safety performance were included in the study. Accordingly, an initial search of articles was found and finally 5 articles met the inclusion criteria and were analysed. Based on the results of the scoping review and a thematic analysis, the relationship of safety communication and safety performance can be classified in five themes: the significance of positive relationships, uniform research methodological, persistent author, specific level of employees, and country thematic focus.

The Significance of Positive Relationship

The articles are united by the underlying theme of a constant positive relationship, which indicates the repeated recognition of a positive relationship between safety communication and safety performance in the construction sites. As example, according to Alfayez (2017), it

reveals that The relationship between safety communication and safety performance is generally positive in Saudi Arabia, but contextual factors may influence the relationship in some cases. Other than that, Umar (2019) in his study in Oman has indicated that there is a strong relationship between safety communication and safety performance, with open and rich communication being crucial for fostering a positive safety culture and improving safety performance. In another study in Oman, Umar (2020) suggests that there is a positive relationship between effective safety communication and improved safety performance within an organisation. Following that Umar strengthened his previous study on the relationship of safety communication and safety performance in 2021, by emphasising the significance of effective safety communication in enhancing safety performance by fostering learning, trust, and a robust safety culture within an organisation at construction sites in Oman. Last but not least, Alfayez (2021), reveals that effective safety communication and feedback between employees and management are crucial for ensuring safety compliance and participation among foreign construction workers in Saudi Arabia, highlighting the importance of positive perceptions of safety communication and feedback in improving workplace safety performance.

Uniform Research Methodological

Based on the thematic analysis, the design of the study that has been conducted by the researchers was various including quantitative analysis, qualitative analysis, mixed method analysis as well as a systematic review. However, the frequent method that has been utilised by the researchers is quantitative analysis. As example, Alfayez (2017) utilises quantitative research in his study towards 282 foreign construction workers, including electricians, iron workers, drillers, plumbers, painters, equipment operators, and other relevant onsite workers in the construction sector in Jeddah, Saudi Arabia. Other than that, Alfayez (2021), employed a survey approach in his study with a sample size of 282 foreign construction workers from one company in Saudi Arabia.

Persistent Author

Across the five publications, two writers consistently examine the correlation between safety communication and safety performance at construction sites in the Middle East. The two people in question are Bassem Abdullah Alfayez and Tariq Umar. Alfayez examined two papers in 2017 and 2021, while Umar conducted three articles from 2019 to 2021. Alfayez pursued his studies in Saudi Arabia, whilst Umar performed his academic research in Oman.

Country Thematic Focus

From the thematic analysis, it can be concluded the relationship of safety communication on safety performance among employees at construction sites in the Middle East has commonly been studied in Oman. From the five articles, there are 3 articles that have been conducted in Oman while the rest have been conducted in Saudi Arabia.

Specific Level of Employees

From the five articles, most of the studies, study among workers. According to Alfayez (2017), his study is focused among 282 foreign construction workers, including electricians, iron workers, drillers, plumbers, painters, equipment operators, and other relevant onsite workers in the construction sector in Jeddah. As well as the study by Alfayez (2021), where his study is focused among 282 foreign construction workers from one company in Saudi Arabia.

Discussion

The utilisation of the scoping review and thematic analysis approach yielded a restricted quantity of research investigating the correlation between safety culture or safety communication and safety performance among construction site employees in the Middle East. The quantity of research incorporated in a scoping review can have a substantial influence on the findings and, consequently, the inferences derived from the study. A limited number of included studies may compromise the comprehensiveness, generalizability, and depth of the scoping review results.

Another factor that influences safety performance on construction sites is communication, which provides a safe working environment for every employee involved. Effective communication facilitates the dissemination of critical safety information, enforces safety practices, and creates a culture of knowledge and responsibility. According to the scoping study, safety communication has a considerable impact on safety performance at construction sites, as evidenced by the consistent positive and significant pattern across all cited papers. Umar (2019) found a strong association between safety communication and safety performance, with open and rich communication being critical for building a positive safety culture and boosting safety performance. In another research, Alfayez (2021) emphasises the relevance of favourable views of safety communication and feedback in boosting workplace safety performance.

Aside from that, according to the scoping review, repeated research is being conducted by the same authors, Tariq Umar and Bassem Abdullah Alfayez. This is due to the fact that they both have a personal interest or passion for a specific variable or topic, which allows them to conduct continuity and longitudinal studies to track changes and trends over time, allowing them to better understand the dynamics of safety communication and safety performance at construction sites. Furthermore, thematic analysis reveals that most researchers prefer to conduct quantitative surveys to investigate the relationship between safety culture and safety performance, as quantitative surveys require less time, money, and energy to conduct than other research methods.

Furthermore, the research is centred in Oman. This might be due to building activity dumping in Oman, which has resulted in tremendous expansion and development in the country's construction and oil and gas industries in recent years. According to Ltd. (n.d.), Oman's construction sector is expected to rise by 3.4% in real terms in 2022. Furthermore, most research involves polls of managers and construction workers. This is because general managers and employees are directly involved in day-to-day operations and are the most vulnerable to possible safety dangers. Their experiences might provide light on the effectiveness of safety measures and the broader safety culture inside the organisation.

Study Limitations

Several limitations have been identified for this study. Although we searched for literature in five credible relevant databases, we cannot exclude there are empirical studies published in other scientific indexes, not included in any index or not accessible through university library subscriptions. In addition to that, this study is only limited to literature that covers Middle Eastern countries and is written in the English language. This searching restriction criteria leads to a lesser number of scoping results, which may affect the scoping review study.

Another limitation includes screening errors. The accuracy of the search string's results further restricts the scope because there are hundreds of pieces of literature to review and filter, which frequently produces inaccurate results.

Despite the fact that this study focuses on the correlations between safety culture and safety communication on safety performance at construction sites, there may be boundaries. As an illustration, the study will only consider and concentrate on the construction sites in the Middle East countries. It is undeniable that several other regions, such as Southeast Asia and North Africa, are enduring the same problem. It is suggested that, in the future, the scoping review should be studied generally in order to get a wide outlook of literature, which can lead to a strong scoping review results as well as produce a more comprehensive body of work on this topic. Finally, papers published after the completion of the scoping review process are not included.

Conclusion

In conclusion, this scoping review contributes to the growing body of knowledge on safety culture, safety communication and safety performance in the construction sites specifically in the Middle east. The synthesis of evidence emphasises the crucial role of safety culture and communication in shaping safety performance outcomes. By recognizing the context-specific nature of these relationships, organisations can implement targeted strategies that promote a positive safety culture and enhance overall safety performance in construction settings. The practical implications derived from this review have the potential to guide interventions, policies, and practices, ultimately fostering safer and healthier construction environments.

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