INTERNATIONAL JOURNAL OF HUMANITIES TECHNOLOGY AND CIVILIZATION
ISSN: 2289-7216 E-ISSN: 2600-8815
VOLUME 10, ISSUE 2, 2025, 246 - 255
DOI: https://doi.org/10.15282/ijhtc.v10i2.13133

RESEARCH ARTICLE

# INSTITUTIONAL PERSPECTIVE ON INVESTMENT IN SAFETY AND HEALTH: AN ETHICAL IMPERATIVE IN LIGHT OF ISLAMIC TEACHINGS ON HUMAN WELFARE AND PROTECTION

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**ABSTRACT** - The *Maqasid al-Shariah* (objectives of Islamic jurisprudence) emphasizes the preservation of five essential elements of human well-being, known as *ad-dharuriyyat al-khams*, including the protection of life (*Hifz al-Nafs*) and property (*Hifz al-Mal*). These principles align directly with the primary objective of occupational safety and health (OSH) management, which is to safeguard individuals and organizational assets from harm. Ensuring workplace safety is vital where risks are elevated. A strong safety culture requires a holistic strategy encompassing organizational, technological, human, and external factors. However, safety initiatives often face budgetary constraints, leading to underinvestment in OSH. This cross-sectional study investigates how organizations approach OSH investment and the interdependencies among influencing factors. Data were gathered through semi-quantitative surveys with Administrative Officers and Technical Heads of one of the public Higher Learning Institutions (HLIs), who are in charge and responsible for budget projection. These data are analyzed using the Decision-Making Trial and Evaluation Laboratory (DEMATEL) method. Findings revealed that management commitment is the most critical factor, significantly impacting communication, procedural compliance, and legal adherence. The study underscores the importance of leadership, adequate funding, and standardized safety practices. Effective management fulfills not only organizational objectives but also the ethical and spiritual imperatives of Islamic law by protecting human life and property.

**ARTICLE HISTORY**
Received : 15th Sept. 2025
Revised : 28th Nov. 2025
Accepted : 11th Dec. 2025
Published : 29th Dec. 2025

**KEYWORDS**
*Higher learning*
*Institution*
*Investment*
*Islamic law*
*Safety and health*

## INTRODUCTION

Keeping employees safe and healthy is a key responsibility for any organization, especially those in technical fields. A strong safety culture, where safety practices are part of daily work, helps reduce risks and improve performance. The organizations must consider how different areas like management, technology, people, and external factors work together (Bautista-Bernal et al., 2024). A good safety culture not only influences how employees act but also helps the organization follow regulations and manage risks better. In Islam, the protection of human life and property as well as lineage is a fundamental principle, as Islam is not only a religion of ritual but also '*Ad-deen*", which is a "code of life". Thus, Islamic teaching also emphasizes safety, responsibility, and the prevention of harm in all aspects of life, including safety and health at the workplace.

The role of occupational safety and health (OSH) has gained significant attention as a critical component of organizational sustainability and performance. In recent years, the financial implications of safety and health investments have become a major focus for organizations. Historically, workplace safety initiatives aimed to ensure compliance with regulations and protect employee well-being. While these remain important goals, there is growing recognition of the economic advantages that safety investments hold. Investing in health could promote positive attitudes and actions that benefit the company and/or workplace (Mearns et al., 2010). As is known to all, investing in safety helps businesses prevent accidents and lower financial costs (Wu et al., 2022). Safety measures such as providing high-quality personal protective equipment (PPE), offering training programs, and implementing adequate safety measures around the workplace contribute to reducing accidents and operational disruptions. This aligns with (Mustard & Yanar, 2023) stating that employers can reduce the incidence of workplace injuries and illnesses by investing in safer technologies, offering personal protective equipment, and training employees and their supervisors. Regarding safety training, Wang et al.

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(2019) found that enhancing miners' safety education and training, creating a safe working environment, and implementing a reasonable management system have positive impact on enhancing workers' safety behaviour. Miller & Haslam (2009) emphasized that organizations benefit financially through lower compensation claims, fewer workplace incidents, and improved employee performance. By viewing safety expenditures as long-term investments rather than short-term costs, organizations can enhance productivity while ensuring the safety of their workplace.

Safety culture as a component of organizational culture represents the shared beliefs, values, and practices that shape attitudes toward workplace safety. It is influenced by several factors, including leadership, employee involvement, and effective communication. Regulators from a variety of industries have begun to pay more attention to safety culture in their audits and discussions with organizations as a result of the rising recognition that it is a critical factor in organizational safety results (Claxton et al., 2022) Bautista-Bernal et al. (2024) highlighted the importance of management commitment, noting that strong leadership is critical for ensuring safety initiatives are well-implemented and widely adopted by employees. As stated in (Arefin et al., 2022), employees exhibit positive attitudes and behaviours in response to social responses, partly from their organizations. According to Isa et al. (2021), a review of early research reveals that management commitment towards safety was the primary factor of effective safety programs. When leaders actively promote safety, it not only improves compliance with regulations and policies but also enhances trust and participation among workers. A strong safety culture is also linked to better risk management, helping organizations identify and address hazards proactively.

Despite the advantages, organizations face significant challenges when investing in safety and health. Budget constraints are a common barrier, often forcing organizations to prioritize operational demand over safety initiatives. Implementing safety measures can be very costly; hence, budgetary restrictions became the most frequent reason why decision makers choose not to invest in safety and health (Lutz et al., 2022). According to several studies that have examined the economic aspect of workplace safety and health, employers do not believe that investing in safety is financially cost-effective (López-Alonso et al., 2013). In other words, the costs of workplace accidents are not thought to be so high that the company needs to invest in safety and health just to avoid these costs. Resistance to change, insufficient training resources, and a lack of safety knowledge further complicate efforts to improve safety practices. Abrahamsen et al. (2021) stressed the importance of addressing these obstacles through strategic planning and resource allocation. This study will explore these challenges through an institutional perspective, emphasizing how organizational structures, norms, and belief systems influence decisions regarding investment in OSH management. Furthermore, from an Islamic viewpoint, the protection of human life and property is a fundamental duty. Islam not only encourages but obliges the proactive safeguarding of lives, which includes the willingness to allocate resources toward effective safety measures as part of fulfilling moral and social responsibilities. Thus, organizations must view safety as a core value and integrate safety initiatives into their operational strategies to ensure long-term success.

**Islamic Principles in Safety and Health Management**

Islam is a comprehensive way of life. Its teachings encompass all aspects of human existence, including guidance for physical, mental, and spiritual well-being. When it comes to safety and health, both elements are deeply embedded within Islamic principles, which emphasize the protection of five essential objectives of human life (al-daruriyyat): the protection of religion, life, intellect, lineage, and property (Ibn 'Ashur, 2011). The Qur'an, Hadith, and Islamic jurisprudence collectively form a holistic approach to ensuring safety and health in both personal and societal contexts. One of the five core objectives of Islamic teachings is the protection of life (hifz al-nafs) (Al-Khadimi, 2003). This principle forms the foundation of many health and safety measures prescribed in Islam. The Qur'an states: "And do not kill the soul which Allah has forbidden, except by right. And whoever is killed unjustly – We have given his heir authority, but let him not exceed limits in (the matter of) taking life. Indeed, he has been supported (by the law)" (Surah Al-Isra', 17:33). This verse not only prohibits unlawful killing but also implies the importance of preserving life through preventive measures, safety planning, and effective health management.

This objective also encourages Muslims to take all necessary precautions to protect their lives and the lives of others. This includes the use of safety measures at home, in transportation, in workplaces, and during emergencies. The Prophet Muhammad (peace be upon him) said: "Do not cause harm or return harm" (al-Qazwini, 2005). The hadith ia a foundational legal maxim in Islamic law that asserts harm must be avoided or eliminated (al-Suyuti, 1998). Any action that causes danger to oneself or others is strictly prohibited. Islam also promotes cleanliness and preventive care as a vital part of protecting life. Cleanliness (taharah) is central to Islamic practice and is directly linked to both physical health and spiritual purity. The Prophet Muhammad (PBUH) said: "Cleanliness is half of faith" (Al- Naysaburi, 2007). Muslims are required to perform ablution (wudu) before prayers, bathe regularly, and maintain a clean environment. These religious practices also have hygienic benefits, minimizing the spread of disease and promoting general well-being. Furthermore, Islam prohibits the consumption of impure or harmful food and drink to prevent poisoning and contamination.

In the context of employment, workplace safety and health are essential aspects of employee welfare, directly affecting productivity, morale, and organizational success. In Islam, ensuring the safety and well-being of workers, facilities, and the environment is not merely a legal requirement but a moral and religious obligation. Employers have a duty to maintain safe working conditions, provide the necessary protective equipment, and avoid exposing workers to undue risks. The Prophet Muhammad (PBUH) emphasized just and compassionate treatment of workers and warned against exploitation. He said:

> "Your employees are your brothers. Allah has placed them under your authority, so whoever has a worker under him should feed him from what he eats and dress him from what he wears. Do not burden them with work that is beyond their capacity." (Al-Bukhari, 2011).

In summary, Islam strongly encourages all actions that help prevent harm and preserve life. This includes various forms of regulation in the workplace, such as the wearing of safety helmets, the use of protective gear, adherence to safety protocols, avoiding hazardous behaviors, and supporting public health initiatives. These principles reflect Islam's holistic view of human welfare and its enduring commitment to safety, health, and dignity for all.

## RESEARCH METHODOLOGY

Guided by the Research Onion Model, this study employed a semi-quantitative research approach to determine the organizational perspectives on workplace safety and health investments. The research focused on key factors influencing safety investments, including legal compliance, management commitment towards safety, availability of safety rules and procedures, safety communication and feedback, and acquisition of safety knowledge. The study was conducted at one of the academic institutions in the East Coast region of Peninsular Malaysia, involving the Administrative Officer and the Head of Technical as the targeted expert respondents. This group of personnel is the officers who are in charge in budgetary projection. The target population consisted of Administrative Officers and Heads of Technical across various faculties and centers within the campus. A total of 14 participants were selected as expert respondents due to their decision-making roles related to workplace safety and health. These individuals help provide valuable insights into the organization's safety practices and investment priorities from an organizational perspective.

Data were collected using a structured questionnaire, which consisted mostly of them are Likert-scale questions and a few open-ended questions. The questionnaire was designed to look at the respondents' perceptions of safety investments as well as the factors that influence safety and health investments. The questionnaire was validated by two experts in human resource management and finance to ensure that it is relevant. The validated questionnaire was then distributed to the selected expert respondents for data collection.

Table 1. Experts for content validation

| Experts | Expertise |
|---|---|
| Expert 1 | Have a very high expertise in managerial finance specifically financial management, internal auditing (social audit, forensic audit, environmental audit), lean six sigma, and management accounting (including cost management and performance management). |
| Expert 2 | Have a high expertise in organizational behaviour (behavioural studies, resource management, knowledge management), and human resource management and leadership (human resource management). |

For data analysis, the expert respondents' view on safety and health investment was discussed, and the interdependency among factors influencing such investments were analyzed using Decision-Making Trial and Evaluation Laboratory (DEMATEL) method. DEMATEL Software of OnlineOutput was used as the software to generate the causal diagram of interdependency among factors influencing organizational investment in safety and health.

### Decision-Making Trial and Evaluation Laboratory (DEMATEL)

Decision-Making Trial and Evaluation Laboratory (DEMATEL) is regarded as a useful technique for determining the causal chain elements within a complicated system. It examines how different aspects are related to one another and identifies the most important ones using a visual structural model (M. Pizzarelli, 2018). In other words, DEMATEL evaluates the interdependent relationship among factors in the study and finds the critical ones through a visual structural model.

### Generating the Direct-Relation Matrix

Building a fundamental matrix to represent the perceived direct-influence relationship between the identified elements in the study is the first step in DEMATEL method. This matrix, also known as direct-relation matrix, is created using a systematic assessment procedure. The experts assess how much of a direct impact one component (row of the table) has on another (column) in the system. A predetermined scoring system is used to quantify this evaluation, giving a certain degree of objectivity and consistency in the assessment procedure. Generally, the scoring system goes from zero (0), which indicates no direct impact, to a higher number, like five (5), which indicates a very strong direct influence. In the corresponding cell of the direct-relation matrix, experts would provide a score indicating the assessed strength of this direct influence. This DEMATEL technique creates a quantitative basis for additional research of the various cause-and-effect interactions inside the system under study by methodically performing this assessment for each pair of components.

Breakdown of Direct-Relation matrix

i. Preparation: Establish a scoring indicate (0-5) in which a score of 0 denotes no influence and a higher number indicates a greater influence.
ii. Matrix building: Make a square matrix with the factors that have been identified listed in the rows and columns.
iii. Expert assessment: Using a scoring system, experts evaluate the direct impact of the row factor on the column factor for each cell (except for the diagonal, where a factor affects itself).

**Normalizing the Direct-Relation Matrix**

Normalization, the second step in the DEMATEL method, is essential to ensure the comparability of expert opinions in the direct-relation matrix. In the first step, the experts rated how much they thought certain pairings of factors in the study had a direct influence on one another. However, as the experts might interpret the scoring system differently, these scores may not be directly comparable. This problem can be solved by normalization, where we convert the raw score of the direct-relation matrix into a range from 0 to 1. The influence relationship between many components can be more objectively analysed through normalizing the direct-relation matrix. Each matrix element is normalized by dividing it by the total of all the values in the column. The overall perceived influence it receives from all other elements is reflected in the sum of the scores in that column. The percentage of the total influence that particular factor receives from the factor in the corresponding row can be determined by dividing each score in the column by the sum earlier. Every column in the matrix goes through this step once more, producing a normalized direct-relation matrix with values that are all between 0 and 1. This normalization sets the stage for further calculations in later stages of the DEMATEL method by ensuring that the influence relationships recorded in the matrix are examined on a uniform and comparable scale.

where:

$Ni,j$: Represent the normalized value in the i-th row and j-th column of the matrix

$Ai,j$: Represent the original score assigned by experts for the direct influence of factor i on factor j in the direct-relation matrix

$\Sigma Ai,j$: Represent the sum of all the values in the j-th column of the original direct-relation matrix. Essentially calculates the total direct influence received by factor j from all other factors in the system.

**Calculate the Total-Relation Matrix**

The third step of DEMATEL method explores total impact, going beyond direct influences. Note that the direct-relation matrix needed to be normalized before in order to make sure that all initial values representing direct influence were in a similar range of 0 to 1. This normalized matrix is used in this step to compute a new matrix called the total-relation matrix. The indirect influence that a component has on another, which is communicated through other factors in the study, is also captured by this total-relation matrix.

Total-relation matrix usually consists of elevating the normalized direct-relation matrix to a certain power (usually 4 or 5). In simple terms, this iterative method determines the total effect of every component on every other element, taking into account both direct and indirect influences that are passed through the network of interconnected factors. The generated total-relation matrix offers a more thorough view of the dynamics of the study by disclosing not only the causes that directly affect the elements but also how these influences ripple through the system and eventually impact other elements. Informed decision-making and intervention strategies are made possible by a more nuanced understanding of the cause-and-effect interactions within the study, which is possible when the total-relation matrix analysis is combined with other elements of the DEMATEL methodology.

$$Total - Relation\ Matrix\ (T) = D\text{^}n \quad (2)$$

where:

T: Represents the total-relation matrix, which captures both direct and indirect influences.

D: Represents the normalized direct-relation matrix obtained in Step 2 (containing the scores after normalization.

n: Represents a power to which the normalized matrix is raised. This value is typically chosen to be 4 or 5, but the optimal power can be determined through specific criteria within the DEMATEL methodology.

The cascading effects of indirect influences would not be adequately captures by simply multiplying the matrix. Hence, a more thorough calculation is ensured by raising the matrix to a power, which takes into account the possibility that a factor's influence may be enhanced or diminished as it passes through the system.

**Producing a Causal Diagram**

The fourth step in the DEMATEL method is producing a causal diagram, an appealing graphic depiction of the extensive cause-and-effect connections found in the earlier steps. The total-relation matrix that was acquired in Step 3 serves as the causal diagram's data source. This matrix includes both direct and indirect influences, capturing the whole effect of each component on all others. In order to produce the diagram, two more crucial calculations are made:

i. Driving Force (D): The total-relation matrix's values in each row are added up to determine this parameter. A high D-value indicates a factor as a possible cause of change since it indicates that the factor has a significant overall impact on other elements.

ii. Dependence (R): An elevated R-value suggests that a factor is highly dependent on outside effects and may be indicative of a system in which other elements have a significance influence. This metric is calculated by adding the values in each column of the total-relation matrix.

These D and R values can be plotted on a graph to show the dependency and influence of the components, which in this case is the factors influencing the organization to invest in safety and health, with R on the vertical axis and D on the horizontal.

**Interpret and Draw Conclusions**

The last step of the DEMATEL methodology goes deeper into the conclusions drawn from the causal diagram and focuses on ranking the factors of interest in order of importance. While the fifth step uses further computations to statistically evaluate the relative relevance and influence of each factor, the causal diagram still offers a useful summary of the driving forces, dependent factors, and interaction factors. The calculation involved summarising the causal diagram, including:

i. Prominence (D+R): The driving force (D-value) and dependence (R- value) for each factor are added up to get the value of prominence. A high prominence value denotes a major role that a factor plays, meaning that it both strongly influences and is influenced by other factors.

$$Prominence = D + R$$

ii. Relation (D-R): The D-value for each factor is subtracted from the R-value to get the value of relation. A positive connection value indicates that the factor is working as a net driver, meaning that its influence on other factors is greater than the influence those other factors have on it. On the other hand, a negative relation value means that the component acts as a net receiver, meaning that it is influenced by others more than it impacts them.

$$Relation = D - R$$

In conclusion, Decision-Making Trial and Evaluation Laboratory can be used to identify the interdependency among the factors that influencing organization investment in safety and health. In contrast to conventional methods that concentrate on separating the causes and effects, DEMATEL recognises the interdependency of the factors influencing organizational investment in safety and health.

## RESEARCH FINDING

This chapter outlines the results from the analysis of the study. The first objective was to identify the factors influencing organizational investment in safety and health. A total of 2 experts had validated the factors that had been identified. A combination of Likert-scale and open-ended questionnaire was conducted for the second and third objectives: to determine the perception of the organization on investing in safety and health, and to generate the interdependent relationship among factors influencing organizational investment in safety and health.

The same experts validated the construction of the set of questionnaires. The validation was conducted by Google Meet as well as email for both experts. From the validation process, a total of 37 questions were generated. It consists of 4 sections, where Section 1 consists of four questions for demographic information, Section 2 consists of six questions for current practices of safety and health, Section 3 consists of seven questions for perceptions on safety and health investments, and the last section, Section 4 consists of twenty questions for factors influencing investment decisions. The questions in the survey were revised and validated by the experts, with both accepting the questionnaire. A total of 14 expert respondents had participated in the survey, providing various perceptions on investing in safety and health. This section will discuss the view of the organization on investing in safety and health as well as the interdependent relationship among factors influencing such investments.

**Perceptions on Investing in Safety and Health and Current Practices**

The analysis of survey responses provided insights into organizational perceptions of safety and health investments. A total of 86% of respondents agreed that investments in safety and health initiatives significantly improved the university's working and learning environment, while the remaining 14% strongly agreed on the statement. This shows that all of the expert respondents are aware of the positive impact of investing in safety and health on the learning environment in the university. Besides, 93% of the expert respondents agreed that it is important to invest in safety and health for the university's success. This aligns with a previous study conducted by Miller & Haslam (2009), stating that safety investments improve employee well-being and lead to financial benefits through cost savings and increased efficiency.

Investing in safety and health is not only beneficial for the employees but also beneficial for the employers and the organization. It has been shown that making adequate investments in safety can both help the company create a safer workplace and reduce the direct costs of future incidents (Roy & Gupta, 2020). Figure 4.2 below shows the responses of

the experts regarding the benefits of investing in safety and health. Based on the findings, all of the expert respondents uniformly agreed that safety and health investment helps reduce accidents and injuries. Followed by accident reduction, improved students' and staff morale was agreed by 12 expert respondents to be one of the benefits of the investment made in safety and health. These benefits can be seen when there is a safety and health investment made by the organization. The implementation of safety and health measures by the organization can help in reducing accidents and injuries as a study conducted by Mullen et al. (2017) states that employees are likely to respond with positive safety behaviours or comply with their own perceived employee safety obligations when they believe that their employers are fulfilling their safety commitments. This shows that not only does investing in safety and health help the university to comply with regulations, but it also helps in creating a better safety culture within the university, reflecting a positive perception of safety as a good investment.

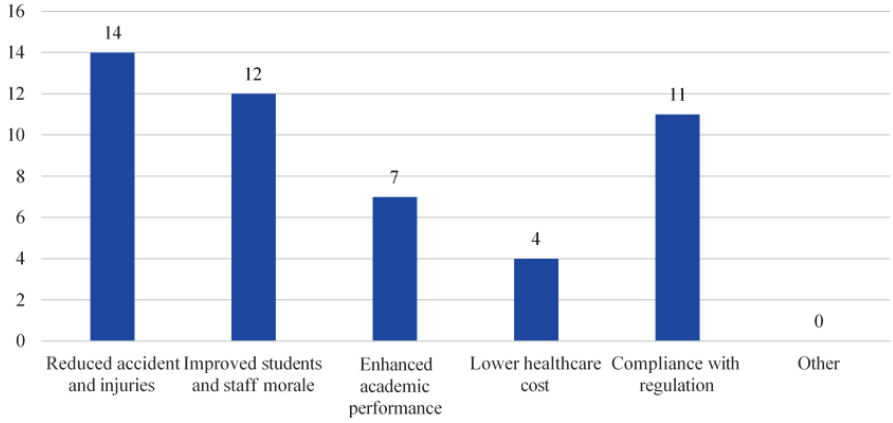


Figure 1. Benefits of investing in safety and health

Even though investing in safety and health comes with great benefits, there are also some challenges faced by the organization when trying to make such investments. The findings from the survey show that 12 experts shared the same opinion, where they agreed that one of the main obstacles to investment is budget constraints. Similar challenges have been highlighted in previous studies, such as Bautista-Bernal et al. (2024), which discovered that organizations frequently had to reduce the priority of safety programs in favour of short-term operational goals due to inadequate financial resources. The lack of consistent funding could also increase the indirect costs associated with accidents, such as higher insurance costs. According to Shalini (2009), these hidden costs are frequently higher than the initial investment necessary for a good safety measure.

**Calculating the Interdependency Among Factors Using DEMATEL**

The interdependency among factors influencing the investment were calculated using DEMATEL. The data collected were analysed using DEMATEL software, where each step of DEMATEL was shown with a causal diagram as the final output. This section will specifically explains the steps involved in calculating the level of interdependency among factors influencing the organization investment in safety and health.

**Generate the Direct-Relation Matrix**

To identify the model of relations among the five factors influencing organizational investment in safety and health, a direct-relation matrix was generated. As this study involves multiple expert respondents, the mean of all of the experts' opinions is used, and then a direct-relation matrix is generated. In this study, a total of 14 opinions were gathered, where seven of them are the opinions of Administrative Officers and another seven of them are the opinions of the Heads of Technical. Table 2 below shows the direct-relation matrix.

Table 2. Direct-relation matrix

| | Legal compliance | Management commitment towards safety | Availability of safety rules and procedures | Safety communication and feedback | Acquisition of safety knowledge |
|---|---|---|---|---|---|
| Legal compliance | 0 | 4.429 | 4.071 | 3.571 | 4.357 |
| Management commitment towards safety | 4.429 | 0 | 4.214 | 3.929 | 4.285 |
| Availability of safety rules and procedures | 4.071 | 4.071 | 0 | 3.357 | 4.214 |
| Safety communication and feedback | 3.857 | 3.571 | 3.5 | 0 | 3.929 |
| Acquisition of safety knowledge | 4.571 | 4.071 | 4.285 | 3.714 | 0 |

**Normalized Direct-Relation Matrix**

To normalize, the sum of all rows and columns of the matrix is calculated directly. This normalization sets the stage for further calculations in later stages of DEMATEL by ensuring that the influence relationships recorded in the matrix are examined on a uniform and comparable scale. The normalized value can be calculated by dividing the original value in the previous table by the sum of the column. Table 3 below shows the normalized direct-relation matrix.

Table 3. Normalized direct-relation matrix

| | Legal compliance | Management commitment towards safety | Availability of safety rules and procedures | Safety communication and feedback | Acquisition of safety knowledge |
|---|---|---|---|---|---|
| Legal compliance | 0 | 0.262 | 0.241 | 0.211 | 0.257 |
| Management commitment towards safety | 0.262 | 0 | 0.249 | 0.232 | 0.253 |
| Availability of safety rules and procedures | 0.241 | 0.241 | 0 | 0.198 | 0.249 |
| Safety communication and feedback | 0.228 | 0.211 | 0.207 | 0 | 0.232 |
| Acquisition of safety knowledge | 0.270 | 0.241 | 0.253 | 0.219 | 0 |

**Calculate the Total-Relation Matrix**

The total-relation matrix provides a comprehensive view of how all of the factors influencing the investments make by the organization on safety and health. Table 4 below shows the total-relation matrix.

Table 4. Total-relation matrix

| | Legal compliance | Management commitment towards safety | Availability of safety rules and procedures | Safety communication and feedback | Acquisition of safety knowledge |
|---|---|---|---|---|---|
| Legal compliance | 4.095 | 4.152 | 4.124 | 3.793 | 4.269 |
| Management commitment towards safety | 4.382 | 4.021 | 4.205 | 3.877 | 5.346 |
| Availability of safety rules and procedures | 4.145 | 3.999 | 3.792 | 3.657 | 4.121 |
| Safety communication and feedback | 3.951 | 3.801 | 3.785 | 3.327 | 3.962 |
| Acquisition of safety knowledge | 4.346 | 4.175 | 4.169 | 3.832 | 4.103 |

**Final Output and Causal Diagram**

The final step of producing a causal diagram is calculating the sum of each row and each column of the total-relation matrix. The sum of rows is D and the sum of columns is R. The D and R value is used to derive the values of D+R, which indicates how important the factor is to the system as a whole, and D-R indicates the net effects that factor has on the system. Table 5 below shows the final output of DEMATEL.

Table 5. Normalized direct-relation matrix

| | D | R | D+R | D-R |
|---|---|---|---|---|
| Legal compliance | 20.918 | 20.433 | 41.351 | -0.485 |
| Management commitment towards safety | 20.148 | 20.830 | 40.978 | 0.683 |
| Availability of safety rules and procedures | 20.075 | 19.713 | 39.788 | -0.362 |
| Safety communication and feedback | 18.486 | 18.790 | 37.276 | 0.303 |
| Acquisition of safety knowledge | 20.764 | 20.624 | 41.388 | -0.140 |

**Interdependency Among Factors Influencing Organizational Investment in Safety and Health**

The interdependency among factors affecting investment in safety and health was demonstrated in Figure 2 below, where analysis using the DEMATEL revealed its nature. Among those factors, management commitment towards safety is revealed as a key driver, influencing other factors, which are legal compliance, availability of safety rules and procedures, safety communication and feedback, and acquisition of safety knowledge. Based on the causal diagram, management commitment towards safety was identified as the most influential factor, with the highest D-R value among all at 0.683, indicating its significant impact on other variables, such as communication and procedural implementation. As previous studies suggest, leadership commitment directly influences how effectively safety programs are implemented and adopted within an organization Bautista-Bernal et al., 2024). According to several studies, the involvement of safety experts enhanced occupational safety and health (OSH) outcomes, including injury rates and safety climate. However, management's commitment and motivation to implement OSH principles determine how effective safety professionals are, and the majority of safety professionals explicitly credit their success to the organizational support they receive (Bunner et al., 2021). Leaders who actively support safety initiatives not only enhance compliance but also build trust among employees, encouraging greater participation and obedience to safety protocols.

Safety communication and feedback emerged as another critical factor, reinforcing the importance of clear, consistent, and open channels of communication. By ensuring that workers are aware of their roles and responsibilities in maintaining a safe workplace, effective communication helps close the gap between the establishment of policies and how they are executed. This supports the claim made by Miller & Haslam (2009) that communication is essential in enhancing safety results. The limited impact of legal compliance as a standalone factor highlights the need for an integrated approach to safety culture. While compliance with regulations is essential, its effectiveness depends on proactive leadership and good communication. Organizations that rely solely on compliance risk neglect the broader cultural and behavioural changes required for sustainable safety improvements.

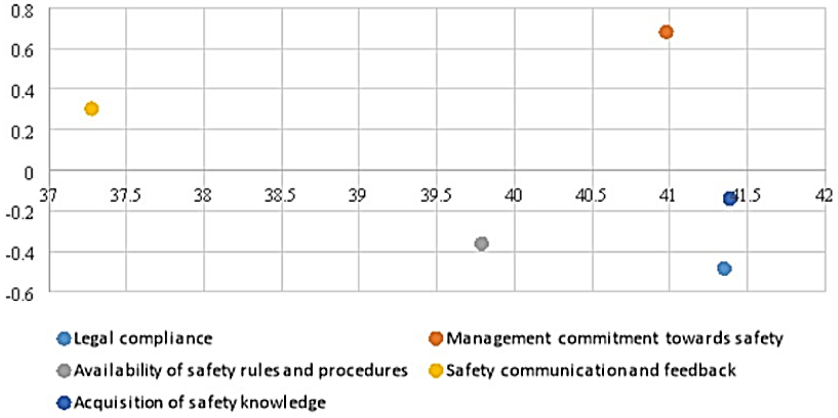


Figure 2. Causal diagram of factors influencing safety and health investments

Budget constraints were identified as a significant challenge in implementing safety initiatives. Respondents indicated that limited resources often affect the frequency and quality of safety programs. These findings align with Abrahamsen et al. (2021) recommendation to view safety expenditures as long-term investments rather than costs. By aligning safety budgets with organizational priorities, organizations can address resource limitations and achieve better safety outcomes. Overall, the results highlight the interconnectedness of management commitment, communication, compliance, and resource allocation in shaping a strong and healthy safety culture. Addressing these factors comprehensively can help organizations overcome challenges and create a safer, more productive workplace.

## CONCLUSION

The findings highlight the important role of management commitment towards safety in influencing other factors, including legal compliance, availability of safety rules and procedures, safety communication and feedback, and acquisition of safety knowledge. This indicates that leadership is essential in promoting safety and health within an organization. According to the results from the survey, Administrative Officer and Head of Technical generally agree that safety and health investments are important, but some areas require improvement, like budget allocation, consistency in conducting training, and procedural enforcement. For instance, there were differences in the frequency of safety training sessions, even though most of the respondents agreed that safety topics are always included in staff meetings. These findings show the need for a more systematic and uniform approach in the implementation of safety and health initiatives across all faculties and departments. The DEMATEL analysis further highlighted the interdependencies among the studied factors of this study. Management commitment towards safety appeared as the primary factor that directly influences the organization's goal to achieve legal compliance, enhance safety communication, and increase safety knowledge. The other factors, such as legal compliance and the availability of safety rules and procedures, were found to improve when management prioritizes safety and health. This shows that the factors influencing organizational investment in safety and health had indeed influenced other factors. This study also revealed that organizational

investments in safety and health pose a lot of benefits to the university. The respondents show strong agreement that investing in safety and health helps create a safer learning environment, reduces accidents and injuries, improves students' and staff morale, and also helps the university comply with regulations.

In conclusion, the findings demonstrate that investing in safety and health benefits the organization by creating a safer environment, reducing accidents, improving morale, and supporting regulatory compliance (Miller & Haslam, 2009). Management commitment towards safety emerged as the most critical factor, driving other elements such as legal compliance, safety communication, and the acquisition of safety knowledge. Strong leadership was shown to be essential in fostering a strong and healthy safety culture and ensuring the consistent implementation of safety initiatives.

From Islamic point of view, creating a safer environment and thereby reducing accidents and enhancing workplace morale is an essential embodiment of the Maqasid al-Shariah. These efforts align with the higher objectives of protecting life (hifz al-nafs) and safeguarding property (hifz al-mal). Ensuring safety, preventing harm, and promoting wellbeing are not merely administrative responsibilities but moral obligations grounded in the principles of maslahah (public interest) and dar' al-mafasid (prevention of harm). Thus, fostering a safe and positive environment reflects the ethical commitment to uphold human dignity, preserve valuable resources, and fulfill the trust (amanah) placed upon leaders and institutions. This study has some limitations, including a small sample size, which it might not fully represent the diverse perspectives within the organization. The focus of this study was also limited to one university campus, potentially restricting the generalizability of the findings to other organizations. Future research should address these limitations by including larger and more diverse samples and exploring multiple organizational contexts.

## ACKNOWLEDGEMENT

The authors would like to thank Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA) for supporting this work. The authors would also like to thank the collaborators from Universitas Darussalam Gontor (UNIDA Gontor) and Universitas Airlangga (UNAIR), Indonesia, for their support in this research. This study was not supported by any grants from funding bodies in the public, private, or not-for-profit sectors.

This manuscript has utilized an AI-assisted tool solely for grammar refinement and language improvement. All content, including the primary data, interpretations, and analyses, is entirely based on the authors' own work and academic judgement.

## NO FUNDING

This study was not supported by any grants from funding bodies in the public, private, or not-for-profit sectors.

## CONFLICT OF INTEREST

The authors declare no conflicts of interest

## AUTHOR CONTRIBUTIONS

A. Ramli is a corresponding author: Conceptualization, Writing – review & editing.

M. S. Nur Ain is the main author: Methodology, Visualization, and Writing – review & editing.

T. M. Tuan Sidek, M.S. Sisca, and D. Ratih: review & editing

## AVAILABILITY OF DATA AND MATERIALS

The data supporting this study's findings are available on request from the corresponding author

## ETHICS STATEMENT

'Not applicable'

## REFERENCES

Abrahamsen, E. B., Selvik, J. T., Milazzo, M. F., Langdalen, H., Dahl, R. E., Bansal, S., & Abrahamsen, H. B. (2021). On the use of the 'Return Of Safety Investments' (ROSI) measure for decision-making in the chemical processing industry. *Reliability Engineering & System Safety*, *210*, 107537.

Al- Naysaburi, Muslim bin al-Hajaj (2007). *Sahih Muslim.* Kaherah: Dar al-Ghad al-Jadid.

Al-Bukhari, Muhammad bin Isma'il (2011). *Sahih al-Bukhari.* Kaherah: Dar al-Ghad al-Jadid.

Al-Khadimi, Nur al-Din Mukhtar (2003). *Al-Maqasid al-Shar'iyyah Ta'rifuha Amthilatuha Hujiyyatuha.* Riyad: Kunuz Eshbelia.

Al-Qazwini, Muhammad bin Zayd (2005). *Sunan Ibn Majah.* Kaherah: Dar Ibn al-Haitham.

Al-Suyuti, ‘Abd al-Rahman bin Abu Bakr (1998). *Al-Ashbah wa al-Naza’ir.* Beirut: Dar al-Kutub al-‘Ilmiyyah.

Arefin, M. S., Roy, I., Chowdhury, S., & Alam, M. S. (2022). Employer safety obligations, safety climate, and safety behaviors in the ready-made garment context in Bangladesh. *Journal of Safety Research*, *83*, 238–247.

Bautista-Bernal, I., Quintana-García, C., & Marchante-Lara, M. (2024). Safety culture, safety performance and financial performance. A longitudinal study. *Safety science*, *172*, 106409.

Bunner, J., Prem, R., & Korunka, C. (2021). Perceived organizational support and perceived safety climate from the perspective of safety professionals: Testing reciprocal causality using a cross-lagged panel design. *Journal of Safety Research*, *78*, 1–8.

Claxton, G., Hosie, P., & Sharma, P. (2022). Toward an effective occupational health and safety culture: A multiple stakeholder perspective. *Journal of Safety Research*, *82*, 57–67.

Ibn ‘Ashur, Muhammad al-Tahir (2011). *Maqasid al-Shari‘ah al-Islamiyyah.* Jordan: Dar al-Nafa’is.

Isa, A. A. M., Wahab, W. A., Omar, R. C., Nordin, M. Z. M., Taha, H., & Roslan, R. (2021). Factors influencing the compliance of workplace safety culture in the government linked company (GLC). In *E3S Web of Conferences* (Vol. 325, p. 06005). EDP Sciences.

López-Alonso, M., Ibarrondo-Dávila, M. P., Rubio-Gámez, M. C., & Munoz, T. G. (2013). The impact of health and safety investment on construction company costs. Safety Science, *60*, 151–159.

Lutz, N., Dalle Grave, L., Richter, D., Deliens, T., Verhaeghe, N., Taeymans, J., & Clarys, P. (2022). What are the economic dimensions of occupational health and how should they be measured? A qualitative study. *BMC Public Health*, *22*(1), 1362.

Mearns, K., Hope, L., Ford, M. T., & Tetrick, L. E. (2010). Investment in workforce health: Exploring the implications for workforce safety climate and commitment. *Accident Analysis and Prevention*, *42*(5), 1445–1454.

Miller, P., & Haslam, C. (2009). Why employers spend money on employee health: Interviews with occupational health and safety professionals from British Industry. *Safety Science*, *47*(2), 163–169.

Mullen, J., Kelloway, E. K., & Teed, M. (2017). Employer safety obligations, transformational leadership and their interactive effects on employee safety performance. *Safety Science*, *91*, 405–412.

Mustard, C. A., & Yanar, B. (2023). Estimating the financial benefits of employers’ occupational health and safety expenditures. *Safety science*, *159*, 106008.

Roy, S., & Gupta, A. (2020). Safety investment optimization in process industry: A risk-based approach. *Journal of loss prevention in the process industries*, *63*, 104022.

Shalini, R. T. (2009). Economic cost of occupational accidents: Evidence from a small island economy. *Safety Science*, *47*(7), 973–979.

Wang, C., Wang, J., Wang, X., Yu, H., Bai, L., & Sun, Q. (2019). Exploring the impacts of factors contributing to unsafe behavior of coal miners. *Safety Science*, *115*, 339–348.

Wu, J., Zhang, L., Bai, Y., & Reniers, G. (2022). A safety investment optimization model for power grid enterprises based on System Dynamics and Bayesian network theory. *Reliability Engineering & System Safety*, *221*, 108331.