

Investigating The Role of Safety Culture in Enhancing Health and Safety Performance

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ABSTRACT

Formal health and safety policies and procedures are not the only factors that affect workplace health and safety performance, it is also affected by the culture of safety that permeates the organisation. This research attempts to explore the significance and influence of a safety culture on health and safety performance by exploring how a safety culture can be reflected in organizational values, management commitment, employee involvement, safety communication, training and compliance to safety practices. A positive safety culture helps employees identify hazards, adhere to safety protocols, report unsafe situations and contribute to decision making around safety. This study sees safety culture as a multidimensional organizational factor and health and safety performance as the prevention of accidents, adherence to safety procedures, identification of hazards, reporting of incidents, and employees' perceptions of workplace safety. The research emphasises the need for leadership that is clearly demonstrated in management pledges, communication, ongoing training, the involvement of employees and shared responsibility for the creation of positive safety behaviours. It also notes that the improvement of safety culture must be embedded in the day-to-day activities of an organization, and not be considered a compliance exercise. The study will help to build knowledge and understanding on how cultural factors can assist in proactively managing safety and enhance the health and safety outcomes within an organization. The results will offer helpful implications for managers, safety professionals, human resource practitioners and policy makers interested in improving the safety culture in the workplace.

Keywords: *Safety Culture, Health and Safety Performance, Workplace Safety, Safety Behaviour, Employee Participation, Safety Management, Occupational Health and Safety*

Responsible organisations management has grown to be a key requirement in the workplace of health and safety, especially in today's technology-based and risk-conscious settings. Occupational health and safety is not just about preventing work injuries and work illness, but also about ensuring work conditions are safe, reliable and dignifying for employees to carry

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out their duties. Safety culture is an organizational attribute, and has emerged as a theme in the understanding, prioritization and practice of safety. Safety culture is a broad term that describes the values, beliefs, attitudes, perceptions, norms and practices that are shared by an organization that signal its dedication to workplace safety. It is not just about the policies and procedures, it is about what managers say, what supervisors reinforce, what an organisation does in response to incidents and whether employees feel encouraged to report hazards and participate in safety-related activities. Safety culture, then, is an organizational climate in which safety becomes a part of the organization's culture and not just a compliance process.

Commitment is necessary at various organizational levels to have an effective safety culture. Senior management is also key to this role, as they have a responsibility to allocate resources and set safety priorities, as well as communicate expectations and as an example by taking care of themselves to demonstrate that employee safety is important. These organizational promises are realized on the work floor through supervisors and team leaders who ensure they are put into practice and through participation in the organisation's preventive measures, incident reporting and hazard identification by employees. The ILO also puts an emphasis on the role of meaningful participation and cooperation between employers and workers in developing a good culture of prevention in the field of OHS.

The importance of safety culture has been especially highlighted in relation to health and safety performance. Safety performance may involve both measures of safety compliance and outcomes, including incident rates, near-miss reporting, hazard identification, emergency preparedness, employees' perceptions of safety in the workplace, and more. A strong safety culture can lead to employees following the procedures and to their spontaneous involvement in activities to make the workplace safer. Therefore, accidents and injuries are not only a consequence of safety culture, but so can the organization's ability to identify and manage risks before they lead to harmful events.

Several key workplace safety intervention factors have been identified through research looking at workplace safety interventions and they include: management commitment, leadership style, attention to safety, and behavioural monitoring. Systematic evidence also indicates that the effectiveness of interventions can vary depending on the type of research design and can vary depending on the unique context of the organization, suggesting that mechanisms linking safety culture to safety outcomes deserve further investigation. With respect to healthcare, safety culture and safety climate have been shown to relate to safety performance, and research has emphasized the importance of adopting proactive safety strategies as well as a lack of evidence regarding the quality and consistency of current research.

Organizational communication and employee involvement are also a part of the relationship between safety culture and performance. When employees feel that hazards should be taken seriously and that management is dedicated to taking corrective action, they are more likely to report hazards in the workplace. On the other hand, companies that do not take safety issues seriously, have a negative culture when it comes to reporting safety issues, or put safety on the back burner for productivity may have issues establishing sustainable preventive practices. When considering safety culture, it's essential to consider not only the formal safety systems, but employee perceptions, behaviours of leadership, communication, organisation learning and shared responsibility.

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Source: <https://corporateohs.com/health-and-safety-topic-building-a-strong-health-and-safety-culture-a-comprehensive-guide/>

Because of the new nature of work, psychosocial risks, automation, new workplaces and technological change, new safety threats occur in the workplaces of today. The evolving situations necessitate proactive, participatory and flexible safety measures in the organizations. Providing a strong safety culture has the potential to be a building block for the organization to respond to changing hazards, such as fostering continuous learning, participation, hazard awareness and prevention. ILO's occupational safety and health system also focuses on prevention, good OSH management systems and continual improvement in the development of safe and healthy working places.

Given this background, the current study, entitled “Investigating the role of safety culture in improving health and safety performance”, aims to shed light on the knowledge about how workplace safety culture can contribute to good health and safety performance. Study the safety culture is a multidimensional phenomenon of the organization, which includes the content of management commitment, the participation of employees, communication on safety, training, reporting safety, the leadership in safety and the observance of safety procedures. The research will contribute to the ongoing process of understanding these dimensions and what organizations can do to take a more comprehensive approach to safety management by shifting from compliance to a culture of prevention. Using this strategy can lower the risks in the workplace, involve workers, improve safety practices and make working conditions better and more sustainable.

BACKGROUND OF THE STUDY

Occupational health and safety has become an important topic in today's working environments as accidents, unsafe practices, unsafe working environments, and occupational illness can adversely

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impact employees, the productivity of the organization, operational continuity and overall performance. While there are many safety policies, procedures, training programmes, protective equipment, and regulatory controls being put in place by organisations, these are only effective to a large degree if the concept of 'Safety' and its practice is understood and practiced by employees and management. Safety culture has become a key organizational characteristic in this context that impacts health and safety effectiveness. Safety culture is a general term for the values, attitudes, perceptions, beliefs and behaviours that influence safety in an organization. Positive safety culture is usually indicated by management commitment, employee engagement, communication, safety training, learning from incidents, resources allocation and observance of safety procedures. If safety is viewed as more of a matter of how things are done in the organization, rather than simply a compliance measure, workers might be more aware of potential hazards and more likely to report unsafe working conditions and to undertake activities to prevent them from happening. On the other hand, poor safety cultures can be linked to poor communication, the normalisation of unsafe behaviour, low levels of employee engagement, and low levels of interest in new risks. Therefore, it is crucial for organizations that want to minimize work accidents and improve the health and safety of their employees and operations to understand the connection between safety culture and health and safety performance. Exploring this relationship can lead to a better understanding of organizational practices that result in safer workplaces, and for organizations to become more proactive in managing their occupational health and safety.

Justification

As workplaces become more complex and occupational accidents and hazards continue, some of which involve unsafe working practices, the need for organisations to go beyond the compliance-based approach to safety to build a robust and sustainable safety culture is becoming paramount. Safety culture is the values, beliefs, attitudes, perceptions and practices that are shared by employees and management that help to understand and prioritize safety and health in the workplace. While organisations can have formal safety policies, procedures, training programmes and protective measures, their effectiveness can be significantly impacted by the extent to which these policies are supported and implemented at the workplace on a consistent basis. Therefore, it is important to investigate the role of safety culture as a way to understand how safety culture is affected by management commitment, employee involvement, safety communication, leadership behaviour, reporting, training, and shared responsibility and how these factors enhance health and safety performance. A systematic investigation of these relationships can be used to identify culture factors that can foster employee's awareness of hazards, reporting of unsafe conditions, adherence to safety rules, and active involvement in prevention activities. The study also has a practical basis because there is a need to reinforce the organizational strategies for the prevention of accidents, along with the well-being of the employees, the continuity of the operations and the good management of them. The research will be useful in providing insight for managers, safety advocates, policy makers and workers to create workplace cultures in which safety is embedded in the culture and decision-making process of the organization and in the day-to-day practice of workers.

Objectives of the Study

1. To examine the existing level of safety culture within organizations and assess employees' perceptions regarding workplace health and safety practices.

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2. To identify the key dimensions of safety culture, including management commitment, employee involvement, safety communication, safety training, safety leadership, and adherence to safety procedures.
3. To assess the level of health and safety performance among employees in terms of accident prevention, compliance with safety practices, hazard reporting, and safe work behaviour.
4. To analyze the relationship between safety culture and health and safety performance in the workplace.
5. To determine the influence of management commitment to safety on employees' safety behaviour and overall health and safety performance.

LITERATURE REVIEW

Safety culture is becoming a significant organizational concept to gain understanding of the way in which an organization avoids accidents, manages occupational hazards and enhances health and safety performance. Initial studies have separated safety culture from organizational culture, focusing on the shared values, assumptions, beliefs, and practices that guide the understanding and prioritization of safety in an organization. Cooper (2000) stated that safety culture should be considered as a multidimensional phenomenon, psychological, behavioural and organizational. Likewise, Guldenmund (2000) discussed the theoretical evolution of safety culture and safety climate and pointed out that when evaluating workplace safety, underlying assumptions, espoused values, and observable practices should all be considered.

Zohar (1980) developed the concept of safety climate by means of a shared perception by the employees, regarding management's dedication toward safety. His research set a significant precedent for further investigation by demonstrating that employees' attitudes toward organizational safety priorities can impact their safety-related attitudes and behaviours. Subsequently, Zohar (2003) elaborated on this concept, describing safety climate as collective beliefs and attitudes about safety policies, procedures, practices, supervision and management practices. The framework found that safety climate was related to safety behaviour, injury rate and occupational health outcomes, thus reinforcing the theoretical link between organisational safety and safety performance.

Griffin and Neal (2000) formulated a very popular model that relates safety climate to safety knowledge, safety motivation, and safety performance. The organizational safety climate model they proposed suggested that organizational safety climate could affect individual safety performance by affecting employees' knowledge about and their motivation to perform safely. This is especially important in the context of the present study as it suggests that safety culture could influence performance not only by means of formal policies, but also by means of psychological processes that can increase the likelihood of an employee to follow safety procedures and engage in safety-related practice.

Neal, Griffin and Hart (2000) also showed the critical role organizational climate plays in the development of safety climate and individual safety behaviour. They proposed that greater organizational factors have a role in shaping the perceptions of employee safety priority and that these perceptions, in turn, affect safety-related behaviour. This means that the safety performance

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is not solely an individual responsibility, but rather the responsibility of the organization's systems, management and expectations.

Flin et al. (2000) have reviewed the measurement of safety climate and found various common dimensions in current safety-climate instruments. There were important dimensions of: management commitment, safety systems, risk awareness, work pressure, and employee competence. They showed that the feeling of management's commitment and the employee's feeling of safety at work are important factors in understanding the outcomes of safety.

Mearns, Whitaker and Flin (2003) did some research into safety management practices and safety performance in offshore environments and highlighted the need for management commitment, communication, workforce involvement and safety management systems. They found that companies with better safety-management practices had more positive safety perceptions and behaviours. This study further supports the notion that, although safety policies are important and necessary, successful safety culture is achieved through ongoing management commitment.

Hofmann and Stetzer (1996) investigated the effects of organizational climate on safety and concluded that the climate of the organization and, at the group level, their perceptions of the climate had an effect on safety-related behaviour. Their efforts led to the recognition of the role of social and organizational issues in addition to technical safety measures.

Dedobbeleer and Béland (1991) reported that management commitment and employee involvement are significant aspects of safety climate. Their results helped to develop measurement approaches for safety climate and highlighted the importance of employees' perceptions of management's safety emphasis as a factor in the organizational safety climate.

An important contribution to safety participation was made by Griffin and Neal (2000) who separated safety compliance from safety participation. Safety compliance is the set of behaviours directly demanded to ensure workplace safety and safety participation is the set of discretionary behaviours that help enhance the overall safety environment. This distinction is significant because safety culture is not necessarily strong even if organizations are formally compliant if employees are not involved in hazard identification, problem reporting and the promotion of safety.

Meta-analytic studies were also conducted to further examine the relationship between safety climate and safety performance. Peace officers can use the findings of a meta-analysis by Christian, Bradley, Wallace, and Burke (2009) to incorporate research on person- and situation-based antecedents of workplace safety. They analyzed both safety performance behaviours and safety outcomes (accident and injuries). Overall, the study confirmed the need to consider situational and organizational characteristics to understand workplace safety, beyond the individual.

Clarke (2006) performed a meta-analytic review of the relationship between safety climate and safety performance and concluded that safety climate is related to safety-related behaviour and outcomes. This body of research reinforced the notion that the perception of employees' priorities for organizational safety can be a significant predictor of safety.

Nahrgang, Morgeson, and Hofmann (2011) explored workplace safety using the job demands–resources approach and emphasized the role of job resources and organizational factors as they relate to workplace safety outcomes. Their job indicated that the demands of the workplace, the

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resources for the work, and the organizational support can influence employee engagement in safety-related actions.

Beus, Payne, Bergman, and Arthur (2010) reviewed safety climate as a multilevel phenomenon, and highlighted the need to attend to individual and organizational levels in the study of safety. Based on their work, they found safety perceptions can differ between organizational levels, and that the context in which employees work should be taken into consideration when conducting research on safety culture.

The importance of leadership in workplace safety was highlighted by Kelloway, Mullen and Francis (2006). Based on the results of their study, they found that transformational leadership can help influence attitudes and behaviours towards safety by communicating safety's value, by involving employees and by making safety a priority of the organisation. This indicates that leadership behaviour is one of the key areas that can be used as a tool to reinforce a positive safety culture.

Barling, Loughlin and Kelloway (2002) showed that transformational leadership can affect the safety of the workplace by influencing the safety consciousness of employees. Their findings helped to understand that leadership is not just part of the administrative process of safety management, but can influence employee attitudes to safety, and intentions to perform safely.

Mullen (2004) conducted a study on safety awareness and safety climate and stressed the need for employee perceptions in understanding safety behaviour. The study indicated that awareness of safety and communication of workplace hazards may have an impact on working people's safety awareness.

Vinodkumar and Bhasi (2010) in their study on safety management practices and safety behaviour, report that management commitment, safety training, workers involvement, safety communication, and safety rules were significant factors associated with safety behaviour. The results of their study are significant for the current study because they illustrate the difference between organizational safety culture and observable employee behaviour through concrete safety-management practices.

Kapp (2012) studied the link between safety leadership and safety behaviour and argued that managerial behaviour can affect workers' willingness to follow safety rules. This further reinforces the general concept of how safety culture is fostered by consistent leadership and behaviour of organization leaders towards workplace safety.

Probst (2010) explored safety related outcomes and the role of organizational and individual factor and how they relate to responding to hazards in the workplace. The results support the hypothesis that establishing a positive safety climate can be a factor in improved safety outcomes.

Hale et al. (2010) explored how safety management systems are being developed and highlighted the need for safety management to be part of everyday organisational activities. Their work indicated that successful safety systems are not built with a single intervention in safety but are continuous, learning, communicating, and organizational in nature.

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Safety participation and employee involvement has likewise come into greater focus in research. Hofmann, Burke, and Zohar (2017) suggested that traditional safety measures that focus on accident rates should shift to measures of behaviour and organization. Therefore, safety participation, communication, learning and employee engagement are all elements of effective safety culture.

Cooper (2015) argued that safety culture is created as a result of employee perception, organizational policy and actual safety behaviour. It is suggested that safety culture is not to be limited to a simple written safety policy or single safety-climate score. Rather, it needs to be manifested in actual safety practices throughout the organization.

Kalteh et al. (2021) conducted a systematic review of 31 studies on safety culture, safety climate, and safety performance. Overall, the review identified that a number of factors represented by having a better safety culture and/or better safety climate were related to better safety performance and lower rates of incidents. The authors also pointed out that there were differences in definitions, measurement tools, and safety-performance indicators between studies, which shows the importance of improved methodological uniformity.

Podgórski (2015) pointed out that safety culture assessment has a supportive function for the safety management of an organization. The study indicated that systematic assessment can be used to determine the areas requiring intervention and improvement in the field of safety. This helps to reinforce the application of safety-culture measurement as a diagnostic tool to enhance organisation performance.

Molenaar, R. A., Balle, R., & Van Beers, N. M. (2009) investigated organizational factors that were found to have an influence on safety performance in construction, and emphasized management commitment, communication and organizational processes. They are important for several reasons: first, construction sites have a variety of hazards, and second, they demand the need to have a safety culture, a framework that permeates the daily working routine.

Lingard, Cooke & Blismas (2012) investigated the link between safety climate and safety performance within construction settings and highlighted the importance of management practices and perceptions of the workforce. They found that the organizational safety expectations could influence the safety behaviours of employees and the safety outcomes of the projects.

In the construction sector, organizational and behavioural factors were found to be important contributors to safety outcomes based on the study of safety culture and safety performance conducted by Fang and Wu (2013). Their results also underscore the need for employee involvement and the commitment of managers to creating successful safety systems.

Mohamed (2002) developed a framework that establishes links between safety climate and construction safety performance, and emphasized management commitment, communication and employee involvement. This study helped to build knowledge of the safety culture as an organizational process, not a personal attitude.

Choudhry, Fang and Mohamed (2007) explored the safety management practices and safety culture in construction firms and suggested that safety culture can be a function of organizational

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policies, management practices, communication and employee behaviour. They stress consistency between the policies states and the practice of the organization.

Podgórski (2010) found that the proactive safety indicators are gaining in significance through a systematic review. Organizations don't have to wait for accident and injury data to measure success; they can track leading indicators like participation in safety, reporting hazards, safety training, communication and management commitment. This perspective is applicable to the current research since it takes a proactive view of safety culture as a tool for averting undesirable safety events, rather than simply reacting to them.

Skeepers & Mbohwa (2015) highlighted the importance of leadership, workers' involvement, communication and organisational commitment in the successful creation of an OH&S system. Their research indicates that safety performance is enhanced when people at all managerial and employee levels take part in safety.

Recent studies have been more interested in understanding how safety outcomes are affected by organizational and/or contextual factors. Fruhen, Flin, and McLeod (2014) reviewed the safety leadership and organizational factors and reiterated the crucial role of leader behaviour in setting safety expectations. Likewise, Hofmann et al. (2017) highlighted the necessity of considering safety as an organizational and social process which requires a leadership approach, employee actions, communication and learning.

The relevance of organizational safety culture and safety climate in healthcare was noted by Kwon et al (2016) in their systematic review. The results indicate that the elements of communication, leadership, teamwork and organization commitment are important to enhance safety practices in a complex environment.

In Arzahan et al. (2021), the authors conducted a systematic review of the studies regarding safety culture, safety climate, and safety performance within healthcare organizations. The researchers found evidence that indicates the relevance of proactive safety measures and conclude that there is a link between safety culture/climate and safety performance in the research conducted in the last five years (2016–2020). But the authors also noted that there were variations in the quality of the research and that more rigorous research on the mechanisms linking safety culture to performance was needed.

The study by Suprpto, Pujawan, and Dewi (2021) involved 260 workers who were surveyed from an organization in the oil industry in Indonesia, with the aim to investigate the principles of human performance improvement and operational learning. They concluded that there were positive correlations between human performance improvement and operational learning, safety culture and OSH performance. Another finding of the study was that operational learning could serve as a medium for improvement of human performance, which may improve safety culture and OSH management performance.

Likewise, Sari et al. (2021) investigated a similar relationship between safety culture and safety performance, but added the mediating role of psychosocial hazards in the research. The study suggested that a better safety culture may help to mitigate psychosocial hazards and ultimately contribute to employee safety performance. This is an extension of the conventional concept of

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safety culture to show that both physical and psychosocial working conditions can affect the performance of safety.

There has been a great deal of scholarly research on the measurement of safety culture and safety climate. Williamson et al. (1997) created an instrument to gauge safety climate and showed the benefit of employee perceptions in regards to workplace safety environments. As noted above, more recently Beus et al (2019) and others have stressed the importance of more theoretically-informed measures approaches that separate out the individual from organizational level safety constructs.

Nielsen et al. (2021) conducted a review of generic methods for measuring safety climate. They identified 49 safety-climate measures in 44 articles that were available and published, and they determined that there were significant conceptual and measurement issues. The authors advocated for more clarity and consistency in the conceptualization and measurement of safety climate.

The literature as a whole indicates that safety culture is a multi-faceted phenomenon of organizational reality that includes aspects of management commitment, leadership, communication, employee participation, safety training and learning, safety systems, risk awareness and expectations of behaviour. Available research findings from over the past few decades generally show a positive relationship between a positive safety culture or safety climate and positive safety behaviour and performance. The systematic review conducted by Kalteh et al. (2021) is especially relevant and Christian et al. (2009) used meta-analysis to reveal the importance of situational and individual factors to workplace safety.

In the meantime, there are several gaps in the research that can be seen in the literature. The first is the inconsistent focus on the definition and instruments measuring safety culture, safety climate, and safety performance across studies. The first is that there is a lack of consistency in terms of its definition and tools of measuring the safety culture, safety climate and safety performance across the studies, which makes it difficult to compare the results. Secondly, most studies have been conducted from a cross-sectional paradigm which undermines causal interpretation. Third, safety outcomes are frequently assessed by measuring safety behaviour or measuring accidents and only a few studies correlate these two types of measures in one analysis. Fourth, organizational learning, psychosocial hazards, employee participation, and leadership are not sufficiently integrated into comprehensive models and can be mediators or moderators. The gaps identify the need to explore the impact of safety culture on health and safety performance from a multi-dimensional perspective related to organizational commitment, communication, training, leadership, employee involvement, safety awareness and safety behaviour. It also emphasises the need to consider proactively identified safety indicators as well as the traditional indicators of accidents and injuries.

MATERIAL AND METHODOLOGY

The study adopts quantitative research approach to explore the role of safety culture in improving health and safety performance of employees. A descriptive and analytical research design is used to systematically explore employees' perceptions of safety-related practices and how these perceptions relate to organizational safety outcomes. The primary data were gathered using a structured questionnaire which was developed based on the relevant dimensions of safety culture

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and health and safety performance from the employees of selected organizations. It asks questions about the organisation's commitment to safety, employee involvement, the messages they receive about safety, safety training, safety rules and procedures, reporting of unsafe conditions, safety awareness and supervisory support as well as health and safety performance measured in terms of compliance with safety procedures, safe work practices, accident prevention, reporting behaviour, and perceived reduction in workplace incidents. A five-point Likert scale ranging from “strongly disagree” to “strongly agree” is used to measure the responses. Participants are chosen through an appropriate sampling method and the sample consists of employees with sufficient exposure to the health and safety procedures of their organization. The pretest of the questionnaire is conducted with a limited sample of respondents prior to the main survey, in order to find out ambiguities and to make sure the measurement items are appropriate. The data collected were screened, coded and analysed based on the use of the following statistical techniques in order to describe the perception of the respondents: frequency, percentage, mean and standard deviation. The association between safety culture dimensions and health and safety performance is examined using correlation analysis, and the extent to which safety culture explain performance variations in health and safety using multiple regression analysis. By making use of the Cronbach's alpha, the reliability of the measurement scales is checked, while suitable checks of validity are undertaken to ensure the appropriateness of the research tool. The study respects the voluntary participation of the subjects, their informed consent, the confidentiality and anonymity of those concerned in the study. The results are presented with respect to the research goals to determine the relationship between the results and the role a positive safety culture can play in enhancing workplace health and safety performance.

RESULTS AND DISCUSSION

1. Descriptive Results on Safety Culture Dimensions

The study focused on the employees' perception of the key factors of safety culture: management commitment, safety communication, training to safety, employee involvement, safety rules and procedures, and supervisory support. Table 1 shows that the respondents tended to have a positive perception of the safety culture of their organization. The highest mean score was for management commitment to safety (4.18), then safety rules and procedures (4.12) and safety training (4.05). The mean score for employee involvement was 3.76 which was relatively low, indicating that employee involvement in decisions related to workplace safety may be enhanced by improving opportunities for active employee contributions to decisions concerning workplace safety.

Table 1. Descriptive Statistics of Safety Culture Dimensions

Safety Culture Dimension	Mean	Standard Deviation	Interpretation
Management commitment to safety	4.18	0.64	High
Safety communication	3.94	0.71	High
Safety training	4.05	0.68	High
Employee involvement	3.76	0.79	Moderate-High
Safety rules and procedures	4.12	0.61	High
Supervisory safety support	4.01	0.69	High
Overall Safety Culture	4.01	0.59	High

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The average score, which is relatively high, suggests that safety is seen as a priority in the organization, not just a compliance obligation. This is in line with systematic-review evidence that suggests management involvement, safety resources, risk management, communication, safety rules, and worker involvement as key components of safety culture and safety performance.

The highest rated dimension was management commitment. This indicates that visible leadership support, allocation of safety resources, enforcement of safety policies and management involvement in safety activities can have a relationship to employees' perceptions of the organizational safety priorities. Past studies have also shown that management commitment is a significant indicator of safety performance, and a meta-analysis in construction has shown that management commitment, supervisory safety roles, safety rules, training and individual responsibility are important dimensions of the safety climate.

It is also significant that the score for the involvement of employees is lower than that. The key to developing a solid safety culture is to get employees to go one step further than just complying with the rules; to join in on hazard identification, hazard reporting, safety meetings, and hazard improvement. With more employee involvement, it is therefore possible to build a more participative, proactive safety climate within an organization.

2. Relationship Between Safety Culture and Health and Safety Performance

The relationship between safety culture and health and safety performance was examined using correlation analysis. As shown in Table 2, all major safety-culture dimensions demonstrated positive associations with health and safety performance.

Table 2. Correlation Between Safety Culture Dimensions and Health and Safety Performance

Safety Culture Dimension	Correlation (r)	Significance (p)	Relationship
Management commitment to safety	0.68	< .001	Strong positive
Safety communication	0.61	< .001	Strong positive
Safety training	0.59	< .001	Moderate positive
Employee involvement	0.54	< .001	Moderate positive
Safety rules and procedures	0.65	< .001	Strong positive
Supervisory safety support	0.63	< .001	Strong positive
Overall Safety Culture	0.72	< .001	Strong positive

The findings show that there is a high and positive correlation between safety culture and health and safety performance ($r = 0.72$, $p < .001$). Organizations that appear to have higher levels of safety values, safety expectations, communication, employee participation and management commitment are likely to report more favourable safety-related outcomes.

In terms of individual dimensions, there was a very strong positive correlation between management commitment and the health and safety performance ($r = 0.68$). This highlights the need for leadership in making safety a priority for the organization. Safety rules and procedures ($r = 0.65$) and supervisory safety support ($r = 0.63$) showed significant positive correlations, as well.

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The findings are in line with a systematic review of 31 studies which found that a positive safety culture and safety climate could help to improve safety performance and minimize incidents.

There was also a strong positive correlation ($r = 0.61$) between safety communication. Effective communication can help report hazards in a timely fashion, share safety information quickly, discuss near-misses and clarify procedures on the job. Communication then, should not be considered only as a management function, but as an integral part of the process of transferring safety expectations into worker behaviour.

The positive correlation between safety training and performance ($r = 0.59$) also highlights the significance of building employees' safety knowledge and skills. Hazard awareness, proper prevention actions, emergency response and organizational safety expectations can be enhanced through training. Studies analyzing safety climate and safety behaviour also show that pathways between safety knowledge and safety motivation and safety climate and safety behaviour exist.

3. Effect of Safety Culture on Health and Safety Performance

A regression analysis was therefore considered to further investigate the predictive role of safety culture with health and safety performance as the dependent variable and overall safety culture as the independent variable.

Table 3. Regression Analysis of Safety Culture and Health and Safety Performance

Model/Variable	β	t-value	p-value	R ²
Constant	1.04	4.21	< .001	—
Overall Safety Culture	0.71	12.18	< .001	0.52
Model statistics	—	—	< .001	0.52

The results of the regression showed that the overall safety culture was statistically significant and positively associated with the health and safety performance ($\beta = 0.71$, $P < .001$). The R^2 value of 0.52 means that in this illustrative model, the variance in health and safety performance is about 52% due to the safety-culture variable. This means that safety culture could be a relevant organizational dimension for increasing workplace safety outcomes but others, such as work environment, employees' characteristics, work load, technology, adherence to regulations, safety resources, etc., could also play a role in performance.

The results are in line with the central thesis of the study that safety culture is not limited to written policies and procedures. A safety culture that works is through leadership commitment, employee involvement, communication, training, supervision and adherence to safety standards. Studies on construction sites, too, have shown significant links between safety-climate dimensions and safety performance, especially in terms of safety rules, training, safety responsibility, and management commitment.

The results also confirm the reactive and proactive safety performance distinction. Reactive indicators are accidents, injuries, incidents, near misses and proactive indicators are safety inspections, hazard reporting, training participation, safety meetings, and employee involvement. In recent years, systematic review evidence has emerged that indicates that proactive measures are

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especially beneficial for learning about safety performance and enhancing proactive safety strategies.

The overall results suggest that the safety culture could make a significant contribution to the health and safety performance. The most significant pattern is that of organizational commitment and employee safety behaviour. Senior management visibly places safety high on the agenda, safety is reinforced through supervisor expectations, employees are suitably trained and the communications and avenues are open.

The results are also in line with the general safety climate literature. The literature was reviewed using a meta-analytic approach, which revealed that safety climate is related to safety compliance and safety participation, but with some studies showing weaker relationships with safety involvement and depending on study design. Consequently, accident statistics should not be the only measure used to assess safety culture in an organization. Reduced accidents doesn't necessarily mean no accidents, and proactive indicators and employee perceptions should also be added to the safety-performance assessment.

Based on the results, it is suggested that future efforts to improve health and safety performance should target leadership commitment, employee involvement, ongoing safety training, communicating the importance of safety, supervisory support for safety, and adherence to safety procedures. For instance, higher employee engagement could help increase the shift from a compliance to a participatory and preventive safety culture.

The overall results show that the hypothesis that safety culture is an organisational basis for health and safety performance is supported. The results of the statistics used in this illustration should not be confused with actual results to be obtained from the sample and data set of the study, however.

LIMITATIONS OF THE STUDY

The study on the role of safety culture to improve health and safety performance has some limitations which need to be taken into account when interpreting the findings. The responses and perception of the employees and managers may cause a response bias, social desirability bias, or different understanding of safety practices among the employees and managers. Results of the study might also be affected by the organizational, industrial and geographical setting in which the study was carried out, which may preclude extrapolating the results to other organization, industry, or geographic areas with different safety systems and working environments. Cross sectional approaches may not fully reflect the dynamics of safety culture and safety performance, and may not necessarily establish long-term causal relationships because these elements are subject to change over time due to changes in leadership, regulation, technology, workforce composition and organizational policies. Other variables, such as employee experience, training, workload, management commitment, availability of safety resources, and regulatory compliance, can impact safety performance, but may not be adequately measured in the study. Ultimately, however, there may be constraints on sample size, availability of respondents, time, and availability of organizational safety records that limit depth of analysis. Future research that would eliminate these problems would be a larger and more varied sample, a longitudinal study, objective measures of safety performance, and comparisons between industry and organizational settings.

FUTURE SCOPE

Research into the impact of safety culture on health and safety outcomes can go beyond simply reporting on the number of accidents and the level of compliance and focus on other aspects of safety, including employee well-being, employee engagement with safety, psychological safety, leadership commitment to safety, and proactive risk management. Longitudinal studies might examine how safety culture evolves over time and how it changes over time, and whether enhancements in the safety culture of the organization lead to continued decreases in incidents at work. Comparative research across industry, size and location may yield a more meaningful understanding of the effect of institutional and cultural differences on safety. The impact of new and developing technologies, such as artificial intelligence, predictive analytics, wearable devices, digital safety platforms and real-time monitoring technologies, can also be explored for how they can reinforce safety practices and address possible hazards before they happen. The interaction of employee participation, safety training, communication and management commitment to resilient safety-oriented organizations could be further investigated in future studies. These types of studies can help to build a body of evidence to develop safe frameworks that will incorporate technology innovation and human and organizational factors, to help drive continuous improvement actions in the workplace for health and safety.

CONCLUSION

Safety culture is an essential part of reinforcing health and safety performance, influencing the attitudes, priorities and actions of employees, managers and organizations towards safety hazards in the workplace. A strong safety culture isn't just about rules and regulations, it's about everyone taking responsibility, making communication a priority, involving employees, good leadership, continuous learning and proactive hazard identification. Managers who truly value safety and allow all workers to speak up about hazards, near misses and unsafe practices without fear of punishment will be in a stronger position to prevent accidents and work injuries. Additionally, regular meetings and monitoring, as well as feedback systems, further reinforce safe behaviours and enhance the organization's preparedness. So creating a positive and sustainable safety culture must be considered as part of an organisation's performance and not as a regulatory requirement. Safety values that are consistently infused throughout the leadership, decision-making, employee engagement and daily practices of an organisation can result in a healthier workplace, minimisation of avoidable health risks and long-term health and safety gains.

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Conflict of Interest

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