Safety Culture and Its Underlying Dimensions: Emergency Services Personnel Perspective

Yasir Gillani [1]   Nasreen Akhtar [2]

Check for updates

Abstract: *Poor workplace safety is causing approximately 2.78 million casualties daily, which leads to a considerable burden of workplace injuries/ diseases costing approximately 4% of the annual GDP of the world (ILO, 2020). To explore the perspective and underlying dimensions of the safety culture of Emergency Services Personnel (Rescue 1122), the present investigation was conducted from 10-5-2023 to 9-5-2024 in the city of Lahore, Punjab. A purposive sample of 12 Participants (9 men and 3 women, including 3 managers, 3 trainers, 3 middle managers, and 3 participants) who had been serving the department for at least 3 years and had a maximum experience of 15 years was obtained. Inductive and deductive approaches were used to discover safety culture and its underlying dimensions based on focus group findings. Semi-structured interviews were conducted for a duration of 45 to 70 minutes, followed by thematic analysis. Major identified themes of safety culture were: safety management, safety environment, safety insights, safety behavior & consequences, and safety participation, along with other sub-dimensions, two new factors (safety behavior & consequences and safety participation) will be a value addition. Management domain comprised of facets like management commitment, leadership, supervision, and organization support. Safety environment domain facets were safety training, equipment availability, safety rules & regulations, communication channels, work schedule, and safety crew. The facets of safety insights and behavior were safety knowledge, safety motivation, safety learning attitude, risk awareness, safety audit, accident reporting, and safety violations reporting mechanism.*

Key Words: Safety Culture, Injuries, Thematic Analysis, Rescue 1122

Introduction

Poor workplace safety is causing approximately 2.78 million casualties daily at the workplace, which leads to a considerable burden of workplace injuries/ diseases as consequences (International Labour Organisation, 2020). Meanwhile, around 374 M terminal injuries, costing approximately 4% of the annual GDP of the world, have been observed worldwide on an annual basis (ILO, 2020). Being a critical issue, crucial steps have been taken to improve the workplace environment but a dire need still exists to decline workplace accidents (Kaplan & Tetrick, 2011; Swuste et al., 2020) causing problems in job performance, health issues, and significant distress while handling the patients and providing required interventions to victims (Momani et al.,2017). Striving for a good safety culture in the workplace is an effective safety management strategy to improve workplace safety.

Initially, the International Atomic Energy Agency (IAEA) introduced the concept of safety culture. The Chornobyl Incident Report (IAEA, 1991) publication attracted researchers from academia and practitioners to deal with the safety culture concept attentively to anticipate the chances of massive manufacturing disasters. That proposal opened up the way for multiple studies to understand the concept of safety culture and its underlying factors related to person, organization, and environment. Now, this safety culture concept has also been adopted by other industries. Despite the variety of studies conducted on safety culture, there are many aspects that require attention to minimize injuries in the workplace. Safety culture

---

[1] PhD Scholar, Department of Psychology, Government College (GC) University, Lahore, Punjab, Pakistan.
✉ yasirgillani325@gmail.com
[2] Assistant Professor, Department of Psychology, Government College (GC) University, Lahore, Punjab, Pakistan.
✉ nasreenakhtar@gcu.edu.pk

empowers the organization's safety measures by spreading employees' safety awareness, especially in an environment where safety breaches may cause considerable harm to public health and environmental safety. As explored by the Institute of Nuclear Power Operations (INPO, 2006), ''Performance is outcome of behavior which can be good or bad'' These are directed by the subconscious mind of an individual and one's awareness regarding safety to achieve desirous behaviors.

In the current era of rapid and profit-oriented industrialization, it has become significant to focus on the health of the employees of an organization. (Goetsch, 2010). Occupational hazards and safety (OHS) measures need to be addressed daily (Alli, 2008), as aside, they may cause irreparable damage to the industry and humans. A standard operating organization must have a strict and well-compliant safety management system for every employee to avoid unwanted situations (Matisoff, 1997). Organizations eager towards goal achievement and profit earning adopt shortcuts and compromise safety culture which puts the overall organization's health in danger (Huang et al., 2012, Baram, 2009). According to Kim et al. (2016), a pleasing decline in accidents happening in developed countries exhibits their keen focus and prioritizing safe practices periodically, which automatically escalates employee satisfaction, job performance, and overall production (Fang et al., 2004).

In contrast, unsafe behaviors may lead to a significant loss of the organization (Ali et al., 2009). Various studies have revealed that employees perform at their best in a safer environment and vice versa, the more they find themselves emotionally attached to their organizations, the more they take it as their moral responsibility to give their maximum (Hald, 2018). This multi-dimensional approach to maintaining such a healthy, supportive, and caring environment makes employees more confident and secure (Vilkman, 2000).

Safety culture is a concept that is comprehensively defined as "a set of standard operating procedures about safety measures which are imparted to employees through proper training to ensure the safest work environment from an incident or its effects (Amponsah-Tawiah and Mensah, 2016). It also reveals employees' safety attitude. Baron and Byrne (1987) defined attitude as a belief, emotion, or specific behavior towards any object, which subsequently develops an attitude about that object. Perception leads to any belief towards a good or bad attitude, while simultaneously focusing on translating experiences into perceptions and monitoring and predicting employees' behavior (Ajzen, 1987).

Safety Culture and Safety Climate

Safety culture and safety climate are conventional parallel themes. However, a clear difference exists between the two concepts. Safety culture primarily focuses on safety management at the organizational level, while safety climate entirely entails employees' perception of workplace safety (Mohamed, 2003). These two concepts have been explored in different scientific papers through two approaches. Mearns and Flin (1999) defined a clear distinction between culture and climate in the first approach. In a study conducted on the precursor context, the researchers considered safety climate as a byproduct of safety culture, and these two concepts should not be mixed (Choudhry, Fang, & Mohamed, 2007). In another approach, no specific difference has been made between both safety culture and safety climate, despite the lack of significant studies having been done in this regard. By viewing the crux of both approaches, it is summarized that both safety climate and safety culture can be chosen as management's commitment factor to utilize recurrently for examining their compliance in an organization. Fang and Wu (2013) argued about selecting safety climate and safety culture survey tools, which remain contentious as no proper method has been adopted to select these tools.

Emergency Services in Punjab

The largest province of Pakistan (Punjab) has an approx-100 million population and 205,344 km² area which is a challenge to compete with (13), existing emergency medical services of the province have limited capacity to respond the emergencies due to the non-availability of permanent physician staff and lack of pre-hospital care (Razzak et al., 2008). The subject of emergency medicine was not part of the curriculum of any major public or private medical institutions. In the same manner, undergraduate medical education goes beyond interning students in emergency departments as a mandatory rotation.

To fill this hilarious gap in emergency care provision and to provide professional pre-hospital emergency services in all urban areas of the province, in 2004, the Punjab government launched the Rescue

1122 scheme in the Punjab province. This service is availed by dialing 112, an emergency toll-free number accessed through any landline or cell number. By spreading its perks through the Rescue 1122 project, this service has been extended to all of Punjab and is now being spread all over Pakistan. Without compromising on standards and maintaining an average response time of 7 min, the service has provided emergency care to approximately 9M people as per records.

Literature Review

In the present progressive era, safety management is of paramount importance to pave the ground for the success of the workforce. Therefore, safety management contributes to organizational success by saving the workforce from fatalities that reduce productivity. Various previous studies indicate unsafe behavior as the primary cause of accidents in the workplace. To analyze the employee's behavior, a study has been conducted; The analyses have shown that the safety of employees as well as supervisors is equally important as they both contribute to the success of an organization. Another interesting aspect of the analysis was that all the components of WSS have shown positive indicators, which shows the continuation of all the previous related occupational hazards and safety studies (Singh & Misra, 2020).

Another study has been done in Sri Lanka (2019) to analyze and enhance the safety culture and education in the field of chemical laboratories. This study has shown the safety awareness among the employees, as 83% believed that the laboratory required improvement in safety measures. Also, some employees need a change in their behavior as the author recommends annual training sessions (Samaranayake et al., 2021). Another study was conducted and came to the surface that management plays a vital role and the intensified inspection and change of employment in the coal industry (Xu et al., 2021).

China has imposed too many strict regulations on work safety in recent years. It is the responsibility of the employer to comply with all the safety regulations. However, the biggest challenge for enterprises and authorities is the lack of a systematic safety audit methodology. Accordingly, a safety measurement tool could be developed, which is required for a safer workplace (Zhang et al., 2019). A study shows that the critical context in safety assessment includes common and specific safety factor items for a specific community or industry, which provides smooth grounds for a safety assessment tool that may identify important aspects of the gas refinery industry, i.e. work schedule, cultural environment, and work away from home (Kalteh et al., 2020).

Rationale of the Study

Most research about safety culture and its underlying dimensions is quantitative and focused on the causes and effects in the chemical or construction industries (Al-Bayati, A. J., et al., 2017). The present study will fill the gap by using a qualitative research approach to explore the emergency services personnel's perspective on safety culture, including identifying the affecting factors of safety compliance, the origins of non-compliance, and compliance-related measures.

Research Question

The research question of the present study was:
What is the perspective of emergency services personnel on safety culture, including identifying the factors affecting safety compliance, the origins of non-compliance, and compliance-related improvement measures?

Method
Participants

A purposive sample of 12 Participants (9 men and 3 women, including 3 managers, 3 trainers, 3 middle managers, and 3 participants) who had been serving the department for at least 3 years and had a maximum experience of 20 years were recruited. Semi-structured interviews were conducted separately regarding safety culture and facets/leads for 45 to 70 minutes. Participants with different positions, experiences, ages, and trades were recruited, and pseudonyms were used to quote the participants' experiences.

Table 1
Demographic Characteristics of Participants (N=12)

S. No	Participants Pesudonyms	Ages	Gender	Experience Years	Position
1.	P1	50	Male	18	Manager
2.	P2	52	Male	20	Manager
3.	P3	45	Female	15	Manager
4.	P4	40	Male	12	Trainer
5.	P5	38	Female	13	Trainer
6.	P6	35	Male	14	Trainer
7.	P7	37	Male	10	Mid-Manager
8.	P8	35	Male	8	Mid-Manager
9.	P9	30	Female	7	Mid-Manager
10.	P10	25	Male	5	Operational Staff
11.	P11	27	Male	7	Operational Staff
12.	P12	24	Male	4	Operational Staff

Semi-Structured Guide

A semi-structured interview of focus group participants was conducted to explore participants' understanding of the safety culture and its underlying factors for emergency services personnel. The protocol for the semi-structured interview was developed; the following are some sample questions.

1. How do you describe safety culture?
2. How do you describe the safety culture at the workplace?
3. What are the underlying factors of safety culture at the workplace?
4. Why is safety culture important for Emergency Services Personnel?
5. What are the reasons for the poor safety culture of an organization?
6. What are the major measures to be taken for safety compliance within the organization?
7. What is the role of management in developing a safety compliance culture among emergency services personnel?
8. What is the impact of a good safety compliance culture on employees' behavior?

Procedure

Initially, permission to start this study was obtained from the departmental ethical committee of Government College University, Lahore, Pakistan. After seeking permission for data collection, the focus group participants from Rescue headquarters were recruited through the coordination officer; they were contacted, and a time was fixed. Upon getting the participants' consent, the objectives and instructions of the study were apprised and it was ensured that their confidentiality regarding their identities would be maintained. After that, participants were interviewed face to face, and this was recorded and transcribed by the researcher, followed by thematic analysis for coding and defining themes (Braun & Clarke, 2006). The interviews were then verbatim transcribed and analyzed using thematic analysis.

Results & Discussion

Codes, subthemes, and central themes were identified through thematic data analysis.
Central and Sub Themes of Safety Culture for Emergency Services Personnel (N=12) *Behavior*

Emergency Services Personal Safety Culture
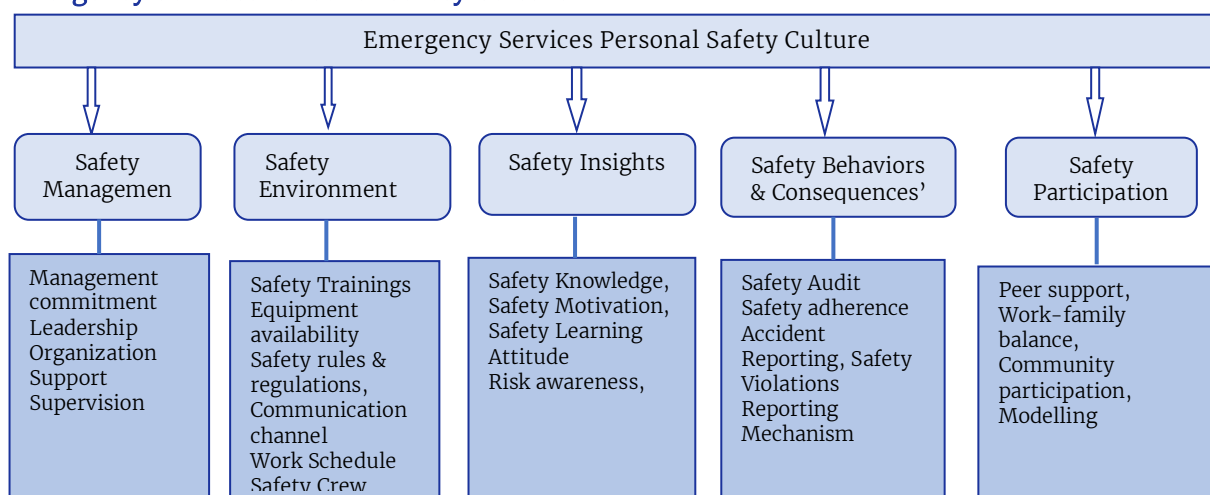
Safety Management

Safety management reflects the role of the organization's management in promoting safety within the organization through active supervision, safety audit, enforcement of safety rules, monitoring, reward system, and compliance reporting mechanism. The presence of all these parameters reflects how actively the management is committed to the safety of the organization. The lack of management commitment, active monitoring, reporting mechanism, reward & punishment system, and even consistency of the policies are leading contributors to compromising the safety of the staff and challenges to perform the duties within the organization as per the job description. This lack of management commitment to safety in the workplace creates an increased risk of injuries and affects the organization's productivity.

One of the Participants said:

"I think we emphasize more on others organizations safety, educate others but need to work more on employees safety by the management. Commitment towards the safety of the employees is compromised due to many factors which may be overcome by the administration which may lead to low commitment and overall performance of the Service."

Results are in line with the previous studies that highlight employee behavior. The analyses have shown that the safety of employees and supervisors is equally important as they contribute to an organization's success (Singh & Misra, 2020).

A Participant during the interview was of the view:

"Leadership is very important in terms of the safety culture of the station, the supervisor of the station plays an important role in emphasizing, monitoring, and implementing safety culture at the workplace."

The results also show that organizations with specific safety cultures may develop more positive safety climates. Also, employee safety compliance is associated with supervisor safety leadership about safety culture dimensions and an organization's safety climate (Petitta et al., 2017). The provided data shows that the active involvement of lab supervisors has a positive impact on academic institutions (Schröder et al., 2016).

He further revealed that:

"We have a hectic routine and have to work for extra duty hours. The job is demanding and there is always a shortage of staff to what actually is the requirement, due to which they are overburdened with work and ultimately pressure of completing tasks increases and they feel stressed-out. He also stated that their performance and safety are also compromised and not up to the mark because of being overburdened due to workload."

This is also by previous research, in which safety assessment tools have identified important aspects of the gas refinery industry, i.e., work schedule, cultural environment, and work away from home (Kalteh et al., 2020). Previous studies have also revealed that extra workload not only causes stress among employees, but they also think of leaving the job when they feel overburdened by workload (Qureshi et al., 2013).

Safety Insights

Safety insights represent the safety knowledge/ skills, motivation & behavior, learning attitude, personal involvement, risk perception, and mindfulness of individuals within the organization. The personal insights of the individuals also play an important role in adhering to safety rules and policies to foster a resilient and safer workplace. This is a very important factor as feelings and thoughts result in action.

Another participant said:

" In my organization, supervisors do not bother whether we wear personal protective equipment or not, nor do we have any proper reporting mechanism, which leads to employee dissatisfaction, resulting in poor service delivery. As wearing PPEs is not a regular practice, we often forget or even intentionally don't use PPEs during emergencies. Improper use of PPEs causes health risks and injuries at the workplace. Although standard operation principles are available and documented, the supervisor does not guide subordinates about following standardized protocols; this situation varies from manager to manager.

One rescue worker reported:

"We don't receive any safety protocols adherence feedback from our supervisor because of lack of reporting and debriefing."

Another rescue worker stated:

"God forbids if we are injured or got vehicle damage, the management will hold a lot of inquires. We know that safety is our responsibility and we take necessary steps as well but we also have to respond to an emergency in limited time."

Another participant added:

"Due to the increasing number of daily emergencies and our obligations to respond in a stipulated time, the risk of accidents also increases.

Various studies also reveal that human behavior contributes to construction accidents. A positive safety behavior leads to positive safety compliance. All the safety issues will remain unsolved unless the interference of the employers with a swift behavior compliance pattern is the only requirement for changing the employee's behavior. Therefore, the core aim of this study is to highlight employers' behavioral safety compliance factors that might boost the employees to adopt behavioral safety compliance (Zin & Ismail, 2012). Compared to the hotel and construction/manufacturing industry, workplace accidents are lower in the hotel industry.

Safety Environment

The Safety Environment is the workplace environment where employees can safely perform their duties. The more the organization provides a favorable atmosphere at the workplace, keeping in view the needs of the employees, the fewer the chances of safety violations. The safety environment also refers to how conducive the workplace is to performing operations safely.

A participant stated,

" There are fewer opportunities to express the safety-related issues openly at the workplace. The supervisors pay the least important to safety issues; their concerns are performing duties in a non-compliant way. At our station, every participant has their safety-related equipment; however, sometimes participants themselves don't bother to respond to emergencies by wearing proper personal protective equipment.

He further articulated:

" The department has provided all safety-related documents and issued necessary directions for safe operations. The likelihood of being caught on safety violations during the operations increases the safe operations by the safe, but unfortunately, there is no active monitoring to ensure adherence to slandered operating procedures. "

Another participant shared:

"Although safety gadgets are provided for every vehicle and person, due to extensive use and even equipment misplacement, we have to arrange these equipment at our workplace. At our workplace, the required equipment always remains in ready condition as we don't compromise safety.

These statements align with previous studies. A study is to understand the position between safety climate and the safety culture of board ships and seafarers. Factor analysis of safety climate identified seven underlying factors – Resource Availability, Job Demands, Support on Safety, Work Environment, Safety Compliance, Organizational Support, and 'Just' Culture. Awareness about seafarers' safety seems low due to the massive difference between the actual safety climate and safety culture values. (Bhattacharya, 2015). In another study, Mozola (2017) reported that a poor working environment negatively impacts employees' well-being, resulting in turnover and loss of efficiency. This brain drain may cause a shortage of skilled workers in the field.

A participant said:

"It is very important that the basic training acquired from Emergency Services Academy align with field requirements and continuity of such training activities at respective stations is vital. This is only possible when the

supervisor takes a special interest in training activities and monitors adherence to safety policies. He further added that there procedure available to review the safety-related policies to update the available procedure. "

A study aligned with a previous study done in Sri Lanka (2019) stated that safety awareness and education are important to enhance safety culture (Samaranayake et al., 2021). Another study supports the importance of safety training, which revealed that organizations having routine OSH training have good safety culture perceptions in comparison to those who do not have regular OSH training sessions (Ahadzi et al., 2021).

Safety Behavior & Consequences

Safety behavior represents individual and organizational behaviors regarding safety practice, following an organization's rules, training utilization, communication with supervisors and subordinates and actively reporting potential threats to safety.

A participant revealed,

Although our organization pays attention to designing and formulating safety-related policies from time to time, honestly speaking, we sometimes do not pay much attention or understand the importance of these rules. These are other obligations to follow and practice. Any of us who are even ready to follow these policies feel peer pressure to think that this is another challenging task, and as a result, we are not fully aware of the safety policies. "

Another participant said:

Although standard operating procedures (SOPS) are defined for safer operations, they need to be reviewed and revised periodically, and thorough feedback should be sought from field formations to align with real-time operations.

A participant revealed:

"The expansion of the service is rapidly underway due to its remarkable achievements in terms of the quality emergency management system and there is a severe shortage of emergency services personnel at some stations. The recommended crew for the emergency response is important for safer operations, this shortage of staff causes extra work hours for the existing staff which may compromise the performance of the staff and risk of injuries or accidents. "

Another participant stated:

"It is also true; that we participants feel that the personal protective equipment is heavy to wear and an extra burden while responding to emergencies, we even look more beautiful without all this stuff. To wear this PPE in such tough weather conditions is quite challenging."

Previous studies also reveal that positive safety behavior leads to positive safety compliance. All safety issues will remain unsolved unless employers interfere with swift behavior compliance patterns as the only requirement for changing the employee's behavior (Zin & Ismail, 2012). It was further explored that the positive change in employees' attitudes affects the overall safety architecture of the organization (Cox and Cox, 1991).

Another participant stated:

" Extra duty hours negatively affect our household duties, personal health, and behavioral complications ."

Research also supports the argument that work-related stresses cause many physiological and behavioral complications in people (Sabbarwal et al., 2017).

Safety Participation

Safety participation refers to how actively employees pay attention to their actions or those of colleagues if they are likely to be hazardous or violate safety rules.

A participant reported:

"The rescue department has made effective policies for safe operations but these policies/SOPs are nor Thoroughly monitored which leads to poor safety practices. Active monitoring is not carried out to ensure that safety-related policies are followed. In this regard, peer support is important as we learn each other. "

Another participant stated:

"*Social support from administration, supervisors, or coworkers is a booster for us. When supervisors praise our professional attitude, we tend to repeat it, ultimately enhancing workplace productivity and motivation.*

Previous studies have revealed that social support from coworkers or seniors / departmental heads at work not only decreased workload but also enhanced motivation to follow the organization's designed policies. This support could be emotional, informational, or instrumental. The role of support in the workplace is vital in performing tasks, for example, dividing workload or responsibility, which makes it easier for individuals to carry out tasks and reduces workload (Bowling et al., 2015).

A participant reported:

Safety violations are not reported or recorded correctly. Managers must maintain a log of such violations and communicate them when writing performance reports. The mechanism of reporting and recording safety violations and safety compliance needs to be designed for safe workplace operations.

These statements align with the previous studies, which emphasize the existence of a reward and punishment system within an organization and the need to refrain from non-compliant behavior, respectively. (Kobayashi & Kerbo, 2012).

Implications

This qualitative research will provide in-depth insights into safety culture and its underlying factors for emergency services personnel, helping to improve workplace safety within organizations and avoid injuries. It will also help develop programs to enhance safety culture.

Limitations and Suggestions

Due to time constraints, the study was conducted on a sample of participants from the province of Punjab only, with varying disciplines, positions, and experiences. Therefore, the findings cannot be generalized. In future studies, safety culture and emerging factors may be further validated through mixed-method research for a better understanding.

Conclusion

It can be concluded that the underlying factors of the safety culture of emergency services personnel are safety management, safety insights, safety environment, safety behavior, consequences, and safety participation. These factors are vital for safety compliance within organizations. Future studies can confidently use them to measure the safety culture not only in emergency services but also in industries to avoid future injuries and accidents.

References

Ahadzi, D. F., Afitiri, A., & Ahadzi, E. (2021). Organizational safety culture perceptions of healthcare workers in Ghana: A cross-sectional interview study. *International Journal of Nursing Studies Advances*, *3*, 100020. https://doi.org/10.1016/j.ijnsa.2021.100020

Ajzen, I. (1987). Attitudes, Traits, and Actions: Dispositional Prediction of Behavior in Personality and Social Psychology. *Advances in Experimental Social Psychology*, 1–63. https://doi.org/10.1016/s0065-2601(08)60411-6

Al-Bayati, A. J., et al. (2017). Impact of construction safety culture and construction safety climate on safety behavior and safety motivation. *Journal of Construction Engineering and Management*, 143(3). https://doi.org/10.1061/(ASCE)CO.1943-7862.0001245

Ali, H., Abdullah, N. A. C., & Subramaniam, C. (2009). Management practice in safety culture and its influence on workplace injury: An industrial study in Malaysia. *Disaster Prevention and Management: An International Journal*, *18*(5), 470-477. https://doi.org/10.1108/09653560911003660

Alli, B. O., & International Labour Office. (2008). *Fundamental principles of occupational health and safety.* International Labour Office.

Amponsah-Tawiah, K., & Mensah, J. (2016). Occupational Health and Safety and Organizational Commitment: Evidence from the Ghanaian Mining Industry. *Safety and Health at Work*, 7(3), 225–230. https://doi.org/10.1016/j.shaw.2016.01.002

Baram, M. (2009). Biotechnological research on the most dangerous pathogens: Challenges for risk governance and safety management. *Safety Science*, *47*(6), 890–898. https://doi.org/10.1016/j.ssci.2008.10.010

Bhattacharya, Y. (2015). Measuring Safety Culture on Ships Using Safety Climate: A Study among Indian Officers. International Journal of e-Navigation and Maritime Economy, 3, 51–70. https://doi.org/10.1016/j.enavi.2015.12.006

Bowling, N. A., Alarcon, G. M., Bragg, C. B., & Hartman, M. J. (2015). A meta-analytic examination of the potential correlates and consequences of workload. *Work & Stress*, *29*(2), 95–113. https://doi.org/10.1080/02678373.2015.1033037

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Choudhry, R. M., Fang, D., & Mohamed, S. (2007). Developing a model of construction safety culture. *Journal of management in engineering*, *23*(4), 207-212. https://doi.org/10.1061/(ASCE)0742-597X(2007)23:4(207)

Cox, S., & Cox, T. (1991). The structure of employee attitudes to safety: A European example. *Work & stress*, *5*(2), 93-106. https://doi.org/10.1080/02678379108257007

Fang, D., & Wu, H. (2013). Development of a Safety Culture Interaction (SCI) model for construction projects. *Safety Science*, *57*, 138–149. https://doi.org/10.1016/j.ssci.2013.02.003

Goetsch, D.L., (2010). *Occupational Safety and Health.* Pearson India

Hald, K. S. (2018). Social influence and safe behavior in manufacturing. *Safety science*, *109*, 1-11. https://doi.org/10.1016/j.ssci.2018.05.008

Huang, Y. H., Verma, S. K., Chang, W. R., Courtney, T. K., Lombardi, D. A., Brennan, M. J., & Perry, M. J. (2012). Supervisor vs. employee safety perceptions and association with future injury in US limited-service restaurant workers. *Accident Analysis & Prevention*, *47*, 45–51. https://doi.org/10.1016/j.aap.2011.11.023

International Labour Organization. (2020). *International Labour Organization.* Ilo.org. https://www.ilo.org/global/lang--en/index.htm

Kalteh, H. O., Salesi, M., Cousins, R., &Mokarami, H. (2020). Assessing safety culture in a gas refinery complex: Development of a tool using a sociotechnical work systems and macroergonomics approach. *Safety Science*, *132*, 104969. https://doi.org/10.1016/j.ssci.2020.104969

Kaplan, S., & Tetrick, L. E. (2011). Workplace safety and accidents: An industrial and organizational psychology perspective. *APA handbook of industrial and organizational psychology, Vol 1: Building and developing the organization*, 455-472. https://doi.org/10.1037/12169-014

Kim, Y., Park, J., & Park, M. (2016). Creating a Culture of Prevention in Occupational Safety and Health Practice. *Safety and Health at Work*, 7(2), 89–96. https://doi.org/10.1016/j.shaw.2016.02.002

Kobayashi, E., & Kerbo, H. R. (2012). Differences in Perceived Levels of Informal Punishments for Non-compliance and Rewards for Compliance: A Comparison of Japanese and American Workers. *Deviant Behavior*, *33*(1), 40–57. https://doi.org/10.1080/01639625.2010.538363

Matisoff, B. (1997). Occupational Safety and Health Programs. *Handbook of Electronics Manufacturing Engineering*, 478–506. https://doi.org/10.1007/978-1-4615-6047-0_16

Mearns, K. J., & Flin, R. (1999). Assessing the state of organizational safety—culture or climate? *Current Psychology*, *18*(1), 5-17. https://doi.org/10.1007/s12144-999-1013-3

Mohamed, S. (2003). Scorecard approach to benchmarking organizational safety culture in construction. *Journal of Construction Engineering and Management*, *129*(1), 80-88. https://doi.org/10.1061/(asce)0733-9364(2003)129:1(80)

Momani, A., Hirzallah, M., & Mumani, A. (2017). Improving employees' safety awareness in healthcare organizations using the DMAIC quality improvement approach. *Journal for Healthcare Quality*, *39*(1), 54-63. https://doi.org/10.1097/jhq.0000000000000049

Mozola, J., Gadas, P., Hrazdil, V., & Radková, P. (2017). Anatase, brookite and rutile from pegmatite near Bobrůvka, Strážek Moldanubicum (Bohemian Massif, Czech Republic). *Bulletin Mineralogie Petrologie*, *25*(1), 3-11. https://www.bullmineral.cz/paper/70

Petitta, L., Probst, T. M., Barbaranelli, C., & Ghezzi, V. (2017). Disentangling the roles of safety climate and safety culture: Multi-level effects on the relationship between supervisor enforcement and safety compliance. *Accident Analysis & Prevention*, *99*, 77-89. https://doi.org/10.1016/j.aap.2016.11.012

Qureshi, M. I., Iftikhar, M., Abbas, S. G., Hassan, U., Khan, K., & Zaman, K. (2013). Relationship between job stress, workload, environment and employees turnover intentions: What we know, what should we know. *World Applied Sciences Journal*, *23*(6), 764-770. https://doi.org/10.5829/idosi.wasj.2013.23.06.313

Razzak, J. A., Hyder, A. A., Akhtar, T., Khan, M., & Khan, U. R. (2008). Assessing emergency medical care in low-income countries: A pilot study from Pakistan. *BMC Emergency Medicine*, *8*(1). https://doi.org/10.1186/1471-227x-8-8

Sabbarwal, S., Singh, M. M., & Amiri, M. (2017, July 1). Occupational stress on employees in information technology organizations. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4886274

Saenko, V., Ivanov, V., Tsyb, A., Bogdanova, T., Tronko, M., Demidchik, Y., & Yamashita, S. (2011). The Chernobyl accident and its consequences. *Clinical Oncology*, *23*(4), 234-243. https://doi.org/10.1016/j.clon.2011.01.502

Samaranayake, A. I., Nishadya, S., & Jayasundara, U. K. (2022). Analyzing Safety Culture in Sri Lankan Industrial Chemical Laboratories. *Safety and Health at Work*, *13*(1), 86–92. https://doi.org/10.1016/j.shaw.2021.11.001

Schröder, I., Huang, D. Y. Q., Ellis, O., Gibson, J. H., & Wayne, N. L. (2016). Laboratory safety attitudes and practices: A comparison of academic, government, and industry researchers. *Journal of Chemical Health &Amp; Safety*, *23*(1), 12–23. https://doi.org/10.1016/j.jchas.2015.03.001

Singh, A., & Misra, S. C. (2020). A Dominance based Rough Set analysis for investigating employee perception of safety at workplace and safety compliance. *Safety Science*, *127*, 104702. https://doi.org/10.1016/j.ssci.2020.104702

Swuste, P., Groeneweg, J., Van Gulijk, C., Zwaard, W., Lemkowitz, S., & Oostendorp, Y. (2020). The future of safety science. *Safety science*, *125*, 104593. https://doi.org/10.1016/j.ssci.2019.104593

Vilkman, E. (1999). Voice Problems at work: a challenge for occupational safety and health arrangement. Folia Phoniatrica Et Logopaedica, 52(1–3), 120–125. https://doi.org/10.1159/000021519

Xu, G., Wang, X., Wang, R., Yano, G., & Zou, R. (2021). Anti-corruption, safety compliance and coal mine deaths: Evidence from China. *Journal of Economic Behavior & Organization*, *188*, 458–488. https://doi.org/10.1016/j.jebo.2021.05.013

Zhang, B., Chu, Z., Cheng, L., & Zou, N. (2019). A quantitative safety regulation compliance level evaluation method. *Safety Science*, *112*, 81–89. https://doi.org/10.1016/j.ssci.2018.10.016

Zin, S. M., & Ismail, F. (2012). Employers' Behavioral Safety Compliance Factors toward Occupational, Safety and Health Improvement in the Construction Industry. *Procedia - Social and Behavioral Sciences*, *36*, 742–751. https://doi.org/10.1016/j.sbspro.2012.03.081