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### Review Article

## Negotiating Risk: Social and Organizational Factors Shaping Industrial Hygiene Practices

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### About Article

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### ABSTRACT

This paper discusses the ways in which societal and organizational forces have influenced the practice of industrial hygiene in the modern working contexts. Its qualitative methodology is meta-synthesis, and the number of articles of the empirical studies relevant to it and included in the databases, that is, *Frontiers in Public Health*, *BMC Nursing*, *Safety*, *Research Society and Development*, and *Buildings*, is fourteen. The analysis is based on the impact of organizational culture, style of leadership, workplace communication climate, and control environment on the performance of hygiene and workplace negotiation of risks. The results have revealed that the workable application of industrial hygiene is not only a technical obligation that demands compliance with regulations but also cultural values concerning security. These leadership behaviors are participatory and transformational, and open two-way communication systems that allow trust and shared responsibility. Conversely, hierarchical, work-based, and compliance-based systems contribute to decreasing hazard reporting, eroding engagement, and hindering the effectiveness of safety programs over time. This paper describes the conceptual framework according to which the social dynamics mediate the results of hygiene and states that the process of risk management is a negotiated and relational phenomenon, but not a technical one. The research proposes the incorporation of collaborative leadership, supportive communication frameworks, and the comprehensive safety values rooted in effective health protection and sustainability of workplaces.

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## 1. INTRODUCTION

Industrial hygiene is the pursuit of the prediction, identification, evaluation, and control of hazards in the workplace that affect the health of the workers. Despite the fact that the discipline has a technical origin, based on engineering and toxicology, the recent literature emphasizes the potential impact of organizational and social systems on hygiene effectiveness (Dasgupta & Islam, 2024). The risk negotiation concept reflects the way the managers, workers, and regulatory actors view and discuss safety concerns in institutional contexts (Sankar *et al.*, 2023). Even though it has regulatory systems and sophisticated engineering measures, there are still occupational illnesses and injuries in different parts of the world (Saik *et al.*, 2025). This persistent problem suggests that risk management is neither a pure technical matter nor a matter facilitated by the leadership behavior, communication style, and workplace ethos. Also, hierarchical power relations, informal social networks, and organizational priorities can intervene in the process of implementing and upholding industrial hygiene standards (Kunodzia *et al.*, 2024).

The disconnect between official safety management plans and those that are practiced at the workplace is the main concern of the paper. There are numerous organizations that use industrial hygiene models that rely on compliance and do not consider cultural and relational elements that impact the engagement of the workers (Naji *et al.*, 2022). This lapse is increasing under-reporting of the hazards, variables, compliance with rules and poor attendance on safety programs. It should be noted that the given paper does not empirically test these relationships. Rather, it suggests a conceptual model explaining the role of organizational culture, leadership style, and climate in communication and institutional context in determining the nature of industrial hygiene practices and risk negotiation.

The research questions that are the leads of this paper are: How do the organizational hierarchies affect the negotiation of risks? How do leadership style, communication, and industrial hygiene outcomes relate to each other? What is the relationship between institutional context and compliance and worker safety behavior? The work contributes to the social sciences on the basis that it correlates industrial hygiene, which is a highly technological field, with wider organizational and sociological theories that describe human and institutional behavior patterns in risky contexts.

## 2. LITERATURE REVIEW

### 2.1. Theoretical Foundations

Industrial hygiene is at the nexus of social and technical systems. This study is based on three theoretical frameworks that give a supplementary view on organizational factors that affect safety outcomes. Modernity has led to socio-political and systemic risk, according to the Risk Society Theory by Beck. In the workplace, industrial hygiene is an institutional measure in reducing such engineered risks. The points fit well in the framework developed by Beck, which suggests that risk perception is also developed depending on social position, institutional trust, and cultural value, instead of calculating and assessing its objective probability. The theory of Organizational Culture assumes that the mutual values and assumptions in

organizations dictate the group behavior, contributing to safety performance and hygienic practice (Harb *et al.*, 2025). According to Schein, there are three levels of culture: observable artifacts, espoused values, and underlying assumptions. In the case of industrial hygiene, this would imply that visible safety action is a mere show on the surface, and there are more fundamental cultural assumptions of production priorities, value of workers, and managerial responsibility that actually define the visible practice.

According to Social Constructionism, risk is not objective, but socially constructed through social interaction and through institutional discourse. This theoretical perspective emphasizes the process by which risk in the workplace is identified, labeled, and responded to using communication between various stakeholders. In combination, these theories support the idea that risk management and hygiene compliance are inbuilt in the cultural norms, leadership models, and systems of meaning. They undermine entirely technical solutions by showing that even the same engineering controls can have varying results depending on the social conditions to which they are applied.

### 2.2. Variables and Hypotheses

According to these theoretical orientations, the paper determined three main independent variables, which are organizational culture, leadership style, and communication climate, and one dependent variable, namely, industrial hygiene effectiveness.

H1: A positive organizational culture that is safety-oriented is related to better industrial hygiene practices. This is a speculation that states that the organizations that are explicitly prioritizing the health and safety of workers will have a higher adherence to hygiene practices and also a higher extent to which workers will take part in safety programs (Harb *et al.*, 2025).

H2: Transformational leadership strategies have a positive impact on worker engagement in hygiene compliance. This hypothesis implies that inspirational leaders who pay individual attention to employees will produce greater commitments to safety practices than leaders who use rules and penalties as their key policies (Sankar *et al.*, 2023).

H3: There is a moderating effect of hierarchical and risk perception by Transparent and two-way communication. This is a hypothesis that leads to the assumption that the negative impact of hierarchical structure on safety outcomes can be partially compensated by open communication channels (Saik *et al.*, 2025).

### 2.3. Organizational Culture and Industrial Hygiene

Organizational culture explains how things are done in a workplace, and it forms unwritten rules that dictate how one should behave, even in a workplace where there is no written policy about this. Another culture that focuses on safety as a fundamental value contributes to the strategy of actively neglecting risks (Harb *et al.*, 2025). On the other hand, cultures that are production-oriented tend to minimize the risk and therefore lead to underreporting, risky behaviors (Saik *et al.*, 2025). The findings of Harb *et al.* (2025) revealed that the institutional culture is significantly associated with compliance



with the practices of standard precautions among the nurses. Collaborative hospitals in which safety issues could be openly deliberated demonstrated significantly greater compliance rates as compared to hierarchical hospitals in which efficiency was the primary priority as compared to caution. Similarly, Saik *et al.* (2025) have shown that well-developed safety cultures also lessen the levels of occupational risk in manufacturing facilities by defining behavioral rules that put hazard control over manufacturing at least temporarily.

The action of cultural influence is based on the normative pressure of peers, the close coordination of the personal and organizational values, and internalization of the safety goals as an aspect of professional identity. Workers feel that hygiene practices are not onerous backaches but inherent manifestations of organizational values that they believe in when safety culture is high (Harb *et al.*, 2025). The role, gender, or tenure-based organizational subcultures can give rise to different interpretations of acceptable risk. Leaders are the leading culture creators, as Schein (2010) notes; hence, cultural revamping to safety should be grounded at the top but nurtured in the middle.

#### 2.4. Leadership, Power, and Risk Perception

The Leadership style determines the perception and approach to risk in organizations fundamentally. Transformational leaders inspire the staff based on vision and trust, and encourage intrinsic drive towards organizational aims such as safety objectives (Sankar *et al.*, 2023). Contrarily, transactional leaders depend on regulations, surveillance, and punishment and produce conformity by extrinsic motivation (Dasgupta & Islam, 2024). The study by Sankar *et al.* (2023) relied on the correlations between leadership styles and the dimensions of the safety climate, which showed that transformational leadership approaches had a significant predictive value on the perceptions of management commitment, supervisor support, and empowerment among workers. These impressions moderated the connection between leadership and real safety actions. Naji *et al.* (2022) associated that good leadership and communication are associated with fewer psychosocial hazards in the oil and gas industries, showing that employee well-being and hazard awareness are mediated by leadership behavior. The leaders who were open with their employees regarding stressors offered them the necessary resources to work safely and recognized the safety contributions established, creating continued environments in which employees felt empowered to decline unsafe tasks (Loubser & Harris, 2025).

According to dos Santos *et al.* (2022), participatory training methods can improve the performance of workers in industries because employees are involved as active participants, not as passive members of the information society on safety. Leadership not only dictates the implementation of policies but also influences the manner in which the workers perceive and respond to hygiene processes. Hierarchical organizations could also limit workers from opposing the unsafe practices due to power, resulting in organizational silence where employees withhold information that can be important to their safety (Ellis *et al.*, 2023).

#### 2.5. Communication and Trust

Risk negotiation involves communication, which is the primary system through which members of the organization exchange information concerning the hazards and arrange protective measures. When the mutual trust is established through open dialogue and the lack of it through one-way communication, it leads to its disengagement (Naji *et al.*, 2022). Effective communication in the context of industrial hygiene suggests that the management is not only to spread safety data, but also to be able to hear the complaints of employees (Kunodzia *et al.*, 2024). According to Saik *et al.* (2025), safety culture and communication are therefore interrelated; clear reporting channels form a feedback loop, and the risk level is lowered in this case, as the dangerous conditions can be identified and corrected early. As reported by Ellis *et al.* (2023), communication failures are members of the safety culture failures in the healthcare setting, and some aspects of the industrial sector may also include a situation where the coordination among departments and shifts is necessary to support a protective system.

The quality of communication includes precision, promptness, availability, and responsiveness. It is necessary that information should be precise enough to make an informed decision, timely enough to it would allow taking preventive measures, and made available to all parties interested (Naji *et al.*, 2022). Trust is a mediating variable that is essential to difficulties between communication patterns and safety outcomes. Employees who trust management believe that organizational messages are true and hence increase compliance as well as decrease resistance (Earle, 2010). Building trust is based on regular displays of the fact that management is concerned about the welfare of workers and upholds safety promises (dos Santos *et al.*, 2022).

#### 2.6. Institutional and Regulatory Context

Regulatory frameworks provide minimum standards of management of hygiene and safety below which organizations are prohibited from legitimately performing. Nevertheless, excessive focus on compliance may cause bureaucratic inflexibility, when, instead of actual interaction, documentation is used (Jogie *et al.*, 2025). Kunodzia *et al.* (2024) also note that managerial commitment and worker participation are often part of the barriers to the implementation of occupational health and safety systems. These impediments become even more problematic when regulatory strategies focus on formality rather than reform.

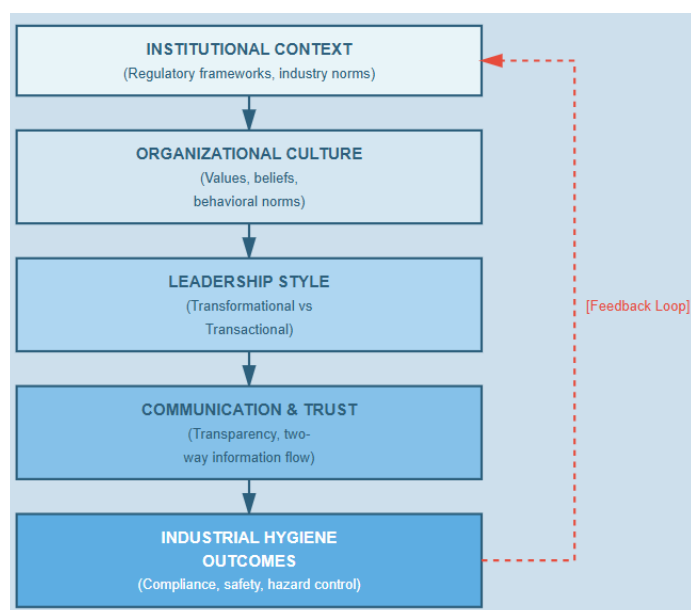
Jogie *et al.* (2025) determined the obstacles to the implementation of the hierarchy of controls in terms of financial factors and managerial reluctance to systemic changes that need large-scale investments. Hierarchy of controls principles focus on eliminating and substituting, whereas the prevalent low-cost control implemented by organizations is personal protective equipment. Dasgupta and Islam (2024) have posed the argument that engineering management should leave compliance with regulations and enter the culture of constant improvement, whereby the organizations actively aim to eradicate hazards. Sustainability of hygiene programs is also entailed by the institutional trust that exists between the organizational and the regulatory aspects. The amount of compliance in countries



using participatory models of inspection is higher than that of countries using a punitive approach (Saik *et al.*, 2025). Whenever organizations perceive inspectors as collaborators in ensuring they can do better, as opposed to opponents who want to penalize violations, they will have more chances of integrating recommendations.

## 2.7. Conceptual Framework

Based on the above literature review, a conceptual model of negotiated risk in industrial hygiene is offered. The framework incorporates all the significant variables in this review and indicates how they are supposed to be related.



**Figure 1.** Conceptual Model of Negotiated Risk in Industrial Hygiene.

Source: Author synthesis based on (Harb *et al.*, 2025; Saik *et al.*, 2025; Sankar *et al.*, 2023).

This model works on the following logic. Boundary conditions and structure of incentives are institutional contexts that influence organizational decisions. Amid these limitations, organizational culture emerges and incorporates the aspects of leadership impact, past experiences, and labor profile. The effective utilization of leadership is influenced by culture in that a particular leadership approach is perceived as valid or invalid. The style of leadership then shapes the patterns of communication by setting standards within conditions of information sharing and feedback responsiveness (Loubser & Harris, 2025). The mediation between leadership and outcomes takes place through communication and trust, which identifies the flow of safety information within the organization. Lastly, hygiene outcomes provide periodic feedback into the culture through organizational learning.

This theoretical model focuses on the mutual relation, as opposed to the causal effect on a linear basis. Companies that encounter severe events tend to change their cultural aspects since experienced members reevaluate past presuppositions

regarding the level of risk that can be tolerated (Ellis *et al.*, 2023). Equally, effective safety programs can reinforce the cultural compliance to safety by showing that protection and productivity do not have to be competitive (Saik *et al.*, 2025).

## 3. METHODOLOGY

### 3.1. Research Design

The qualitative meta-synthesis design adopted in this paper has been interpreted and combined using empirical evidence that is available based on the organizational and social factors that affect industrial hygiene practices. It is not on numerical data but rather on interpretative work, where the underlying conceptual patterns and relationships in studies published between 2022 and 2025 will be determined.

### 3.2. Search Strategy and Data Sources

The systematic search of literature was carried out in the following academic databases: Frontiers in Public Health, BMC Nursing, Safety, Research Society and Development, and Buildings. The search was done between January and November 2025.

The search strings used included Boolean combinations of keywords, such as:

- “industrial hygiene” AND “organizational culture”
- “occupational safety” AND “leadership”
- “risk communication” AND “workplace”
- “safety climate” AND “hierarchy”
- “risk negotiation” AND “industry”

In the first search, 143 articles were found. Following a screening of duplicates ( $n = 27$ ), 116 articles were left to undergo title and abstract screening. Among these, 84 of them were eliminated because they failed to test the social or organizational factors. The entire content of 32 articles was carefully examined. Out of the 16 identified studies, fourteen studies were incorporated into the final synthesis as they are considered to be relevant, methodologically sound, and consistent with the objective of the study.

### 3.3. Inclusion and Exclusion Criteria

Inclusion criteria:

- Empirical qualitative or mixed-methods studies
- Focus on cultural, leadership, communication, or institutional influences on industrial hygiene or occupational safety
- Published between 2022–2025
- Peer-reviewed and written in English

Exclusion criteria:

- Purely technical or engineering-only hygiene studies
- Opinion papers, editorials, or conference abstracts
- Studies not examining organizational or social dimensions

### 3.4. PRISMA Flow Summary

- Records identified through database searching: 143
- Records after duplicates removed: 116
- Records screened (title/abstract): 116
- Full-text articles assessed: 32
- Studies included in synthesis: 14





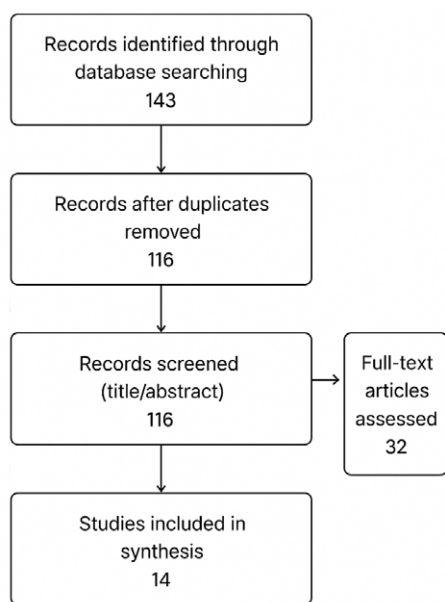


Figure 2. PRISMA Flow.

### 3.5. Analytical Approach

The method of thematic synthesis was utilized. All the studies were coded according to such concepts as organizational culture, leadership, communication, and regulatory structures. Codes were then challenged and clustered into larger themes to determine the similarity of patterns and regard these as dynamics in situations.

### 3.6. Validity and Reliability

The triangulation within the industry sectors was used to increase the credibility, as the education on healthcare, construction, manufacturing, and oil and gas settings was examined. Only literature that had used transparent methodology and believable qualitative standards was allowed. Consistency of patterns was established through cross-comparing the results across contexts to differentiate between consistent and context-specific insights.

## 4. RESULTS AND DISCUSSION

### 4.1. Overview of Key Findings

A review of the chosen articles found that there were stable patterns of interaction between organizational culture, leadership, communication, and institutional context to

influence industrial hygiene outcomes. Instead of these variables being independent variables, they make a system of variables that depend on each other in such a way that the cultural values are influenced by leadership behaviors, the communication norms can maintain mutual trust, and the institutional pressures can outline the limits of these interactions. It has been identified that the transformational and participatory leadership styles result in open communication climates, which strengthen the safety-focused cultural norms. Hierarchical leadership and compliance-based communication, on the other hand, undermined group engagement and compromised transparency to be able to administer hygiene practices.

In all the studies analyzed, a robust safety culture was not an eventual development but rather a result of a series of interactions between enabling leadership and open communicative processes (Handayani, 2025). In addition, the institutional and regulatory arrangements also contributed to the realization of the relationships as they either facilitated collaborative learning or limited it with strict compliance mechanisms. In such a way, the effectiveness of industrial hygiene could be most adequately described by the fact that the negotiation between cultural, communicative, and institutional processes, determining organizational behavior, occurs regularly (Harb *et al.*, 2025; Saik *et al.*, 2025; Sankar *et al.*, 2023).

### 4.2. Hierarchical Influence and Communication Gaps

Hierarchical organizations are noted to have bottlenecks in communication where frontline feedbacks are usually filtered through a number of layers before it reaches the decision-makers. As Kunodzia *et al.* (2024) noted, this problem was present in construction companies in South Africa, as the highest-level management restricted the participation of workers in deciding on safety measures. The workers had specific awareness of application hazards but no avenue to transmit the knowledge to the highest authority. According to Ellis *et al.* (2023), the complexity of communication in healthcare institutions interferes with the evaluation of safety culture. There were several reporting systems, professional Leviathan, and departmental silos that maintained the division of information streams and did not allow a holistic perception of risks at the level of the whole system. Employees were either afraid of being blamed or the systems established to report unsafe conditions were complicated, making workers evade them (Naji *et al.*, 2022).

Table 1. Relationship Between Hierarchical Structure and Hygiene Compliance

Organizational Level	Communication Pattern	Observed Effect on Hygiene Practices	Key Source
Top Management	One-way policy directives	Emphasis on compliance over engagement	Kunodzia <i>et al.</i> , 2024
Middle Management	Selective information flow	Inconsistent enforcement	Ellis <i>et al.</i> , 2023
Frontline Workers	Limited feedback channels	Underreporting of hazards	Naji <i>et al.</i> , 2022
Participatory Structures	Two-way communication	Improved trust and compliance	Saik <i>et al.</i> , 2025

The table demonstrates the differences in communication patterns along the organizational level and the impact of these

differences on the hygiene outcomes. Top management is the category that usually uses formal channels of communication



that focus on compliance. Middle managers are selective in transferring information according to conflicting demands. Frontline workers have in-depth operational knowledge, and in most cases, they have ineffective upward communication channels (Kunodzia *et al.*, 2024).

4.3. Organizational Culture and Safety Behavior

In all the reviewed studies, organizational culture was found as an overriding yet inseparable factor influencing hygiene behavior, which operates in reciprocal interaction with leadership style and specific communication practices. Culture was not found to be a solitary phenomenon but instead existed among the daily interactions between the leaders and employees, as communication norms led to heightened or vitiated safety-oriented values based on the behaviour of the leader. Harb *et al.* (2025) proved that in those hospitals where the collaborative leadership style and openness were developed, the culture of shared safety responsibility was formed, which led to high rates of compliance with the hygiene standards (Naji *et al.*, 2022). However, in hierarchical or political based organizations, the lack of involvement was caused by narrow communication avenues, which undermined cultural alignment towards safety objectives.

The research by Saik *et al.* (2025) affirmed that shared responsibility in the participatory cultures also reduced occupational risk, but it became strongest when the leaders set a positive example of safety behavior and had transparent communication structures in place. Leadership was therefore a culture driver, one that would turn abstraction values into the practices that would be seen through recognition, trust-building, and inclusion. Conversely, transactional or compliance-based leadership impeded communication, stimulating adherence to the regulations instead of involvement and creating a disincentive to act safely (Dasgupta & Islam, 2024). The results link organizational culture as an outcome and force of the communicative and leadership processes. In the case where communication brings about psychological safety and the leaders are open and show empathy, it is the cultural norms that shift to become learning and collaborative. Nevertheless, the culture shifts towards the output instead of protection when another aspect of managerial communication is that of production speed or control. In order to change the bad cultures, transformational and collaborative leaders should incorporate the concept of safety within the communication practices, decision-making manner, and reward systems that compensate a proactive hygiene behavior (Sankar *et al.*, 2023).

Table 2. Relationship Between Leadership Style, Organizational Culture, and Hygiene Outcomes

Leadership Style	Cultural Orientation	Hygiene Outcome	Empirical Source
Transformational	Learning and participatory	High compliance and reporting	Sankar <i>et al.</i> , 2023
Transactional	Rule-based and hierarchical	Moderate compliance, low engagement	Dasgupta & Islam, 2024
Laissez-faire	Weak cultural alignment	Poor hygiene performance	Naji <i>et al.</i> , 2022
Collaborative	Trust-based and inclusive	Sustained compliance	Harb <i>et al.</i> , 2025

This integration illustrates the fact that a safety-oriented culture is guided by leadership and communication to form and maintain. A communicative, learning culture is not an accidental thing that appears, but rather it is created by the regular application of participatory leadership, which would transform safety into a communal and experiential organizational value.

4.4. Trust and Communication as Mediators

Trust and communication were found to play a central mediating role between leadership, organizational culture and hygiene behavior. The concept of effective communication, as with the studies discussed, was not just a part of information but a process of connections between the norms of safety, expectations and meanings. Open communication between leaders and fostering a conversation generated trust, which further enhanced internalization of safety values by employees and also an organisational culture of participation. Meanwhile, hierarchical communication, one-way communication, and punitive communication weakened trust, and the willingness of the employees to report the possibilities of hazards or to take up collective safety action was restricted (Naji *et al.*, 2022; Ellis *et al.*, 2023). The quality and tone of communication were influenced directly by the leadership style. The trust was cultivated

through modeling openness, responsiveness, and caring by transformational and collaborative leaders in their interactions, which then helped in translating the cultural values into consistent behavior regardless of the organizational levels (dos Santos *et al.*, 2022). Such communicative practices enabled employees to feel that safety was their collective responsibility, and not a command by the managers. High compliance-based communication and low relational bond required in the long-term engagement were strengthened by transactional leadership or authoritarian leadership and deteriorated (Dasgupta & Islam, 2024). Trust was also the adhesive glue between culture and communication. High trust in safety, new cultures allowed the establishment of open-loop feedback where employees expressed their issues without the threat of punishment, and, in turn, organizational learning and adaptability (Ellis *et al.*, 2023). These participatory communication practices enabled vibrant feedback systems- in which incident and near-miss lessons constantly transformed the leadership priority and cultural benchmarks. This loop resulted in what Saik *et al.* (2025) termed a learning safety system, which, in turn, could change depending on the emergence of new risks. Institutional forces also affected the level to which communication and trust could succeed at the institutional level. Stiff adherence models tended to inhibit discussion, in favor of

drawing lines and strictness. On the contrary, the participatory inspection and collaborative governance frameworks promoted openness between regulators and organizations, subsequently strengthening internal trust networks.

#### 4.5. Institutional Context and Regulatory Pressures

Mutual Organizational leadership, culture, and communication systems are moderating variables whose impact is determined by institutional and regulatory contexts. Although regulations are aimed at leveling the performance of safety and hygienic aspects, the analysed literature also indicates that the stringency of compliance regime may inevitably hamper the very social and organizational processes, namely trust, open communication and adaptive leadership, that bring performances of such systems to fruition. According to Jogie *et al.* (2025), a lack of finance and managers unwilling to alter the system on a larger scale were more likely to lead to superficial integration into the hierarchy of the controls, in which antidotes to the issue in the form of personal protective equipment were more preferable than abolition or substitution. This trend is the remarriage of priorities of leadership regarding the issue of empowerment and conducting conversations to the paperwork and process control. This is a high regulation or hierarchal industry where defensive communication patterns are widespread, this is because leaders are enticed to exhibit formal obedience instead of enhancing learning or teamwork. Kunodzia *et al.* (2024) claimed that the excessive number of documentation requirements on the construction firms served to introduce what they termed the complacency fatigue, wherein their respective organizations were focused on making sure that the paperwork was signed rather than having the employees discuss the safety in a positive way. These environments strengthen transactional leadership behavior and bureaucratic culture, which risks dialogue and participatory participation in risk management (Al-Mekhlafi *et al.*, 2025).

On the other hand, in institutional systems that promote flexibility, joint responsibility and involvement in supervision, the synergy between leadership, culture, and communication will be enhanced. Dasgupta and Islam (2024) underline that the combination of regulatory systems with a culture of constant improvement would allow the leaders to implement compliance as a growth mechanism instead of a punitive one. The communication leadership in such situations is active, focusing more on learning, trust, and feedback loops, and less on the compliance levels. Sustainability of industrial hygiene practices in the long term is reliant on institutional trust, which refers to the idea that regulatory systems are founded on supporting improvement and not punishment. The research study conducted by Saik *et al.* (2025) proved that the participatory model of inspection, which assumed open interaction between the organizations and regulators, resulted in openness and innovativeness. These forms of cooperation gave a case in which the leaders could reconcile the regulatory requirements with the cultural requirements within the organization and remove bureaucracy, and convert compliance into a source of safety through learning.

#### 4.6. Integrative Discussion

The synthesis of its reviewed studies shows that the effectiveness

of industrial hygiene is the result of an interactive and two-sided relationship between organizational culture, leadership, communication, and institutional context. These variables are an interlocked socio-technical system where any interaction in any of the dimensions causes feedback on others. They are not independent predictors, but they do work off of reinforcing cycles of influence that dictate the ways organizations interpret and respond to workplace risks. The transformational and collaborative leadership thrive with the establishment of a set environment where the culture of participation and safety is going to breed (Bano *et al.*, 2025). The accepted practices of such cultures are open discussion, trust and shared responsibility, where the issues can be discussed through open discussion and leaders can discuss the practice of relating employees as stakeholders in the safety practice as opposed to being rule followers. Transformational leaders, in their turn, articulate and pitch these cultural values with the help of the repetitive patterns of communicating: aping the transparency and listening to the feedback, establishing the safety in the day-to-day decision-making, etc. As a manifestation of an organizational culture, such a two-way process demonstrates that leadership is recreated as a culture-directed and culture-adaptive learning and continuous process (Harb *et al.*, 2025; Sankar *et al.*, 2023).

The linking mechanisms through which the intentions of leadership and cultural norms are transformed into tangible safety behaviors are communication and trust. Open communication promotes shared knowledge of risk, and transparency decreases inhibitors to hazard or mistake reporting. As time passes, all of these processes contribute to the formation of the cultural expectation that safety discourses are acceptable and desirable, which creates a self-reinforcing feedback loop between leadership practices, communicative climate, and cultural development (Naji *et al.*, 2022; Ellis *et al.*, 2023). These dynamics are again influenced by the institutional and regulatory context, either aggravating or limiting them. Organizational cultures that have participants who are regulators as opposed to enforcers of stringent governance practices are more likely to incorporate compliance processes into overall cultural learning. This makes leaders utilize communication as a developmental process to build internal trust and accountability (Saik *et al.*, 2025; Dasgupta & Islam, 2024). Nevertheless, when regulation is very strict, leadership may be defensive and may be transactional in such a way that it will result in bureaucratic compliance and not engagement.

#### 5. CONCLUSION

The study concludes that social and organizational dynamics, not technical processes, are the key predictors of industrial hygiene. Good interaction between work culture, leadership, and communication is fruitful as it leads to healthy hygiene behaviors promoting safety as an organizational value. Trust is considered in good leadership where one is perceived to be an exemplary role model regarding safety, trust, participating, and non-communicating free-flowing information within the organization, as regards risks at all levels. When an organizational culture is established where teamwork and learning become the most important and obedience is eliminated,





the hygiene behavior will be owned and contributions provided by the employees towards making a culture of continuous improvement. Being as crucial as accountability, the systems of regulations must remain flexible in providing opportunities and contributions towards working in the various industrial circumstances. The paper points out that sustainable risk management relies on the combination of technical knowledge and social responsibility. Any future endeavor to enhance industrial hygiene must engage in building the capacity of the workers, building a transparent communication bridge, and developing leadership that is receptive to productivity and well-being. Finally, the purpose of industrial hygiene to ensure the good health of the working community can be obtained only in a situation where the organizations accept safety as a shared, negotiated process, inherent in their daily culture and decision-making paradigms.

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