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OHSMS Effectiveness in Reducing Workplace Accidents: A Systematic Review

Arum Tri Iswari Purwanti[1*], Andre Pratama Adiwijaya[2]
[1]Informatic System, Gunadarma University, arum_tri@staff.gunadarma.ac.id, Depok, Indonesia
[2]Informatic System, Gunadarma University, andre64@staff.gunadarma.ac.id, Depok, Indonesia

Abstract
This study aims to synthesize and clarify evidence on how Occupational Health and Safety Management Systems (OHSMS)/Safety Management Systems (SMS) influence workplace accidents, injuries, and incidents, given persistent safety challenges and inconsistent findings across sectors. A systematic literature review design was applied using protocol-based database searching, staged screening (title–abstract and full-text eligibility), and structured data extraction from peer-reviewed publications. The evidence was synthesized through thematic analysis and organized into three analytical streams: outcome-oriented effects, maturity/continuous improvement, and culture–climate mechanisms. The review finds that OHSMS/SMS implementation is generally associated with improved safety outcomes, but the magnitude and consistency of effects vary depending on implementation quality and measurement choices. System maturity and continuous improvement (e.g., PDCA-based cycles, performance measurement, management review) repeatedly emerge as key explanations for heterogeneous results among organizations with similar formal systems. Safety culture and safety climate function as critical mechanisms translating formal systems into behavioral change, strengthening training, communication, perceived safety control, and learning processes that support accident prevention. The findings imply that policy and practice should move beyond audit-driven compliance toward maturity-based evaluations, leading indicators, and interventions that institutionalize learning and culture-building. This review offers originality by integrating fragmented research streams into a coherent pathway linking OHSMS/SMS maturity to culture–climate mechanisms and measurable safety outcomes, and by proposing a structured agenda for standardizing indicators and improving comparability across future OSH effectiveness studies.

Keywords : *OHSMS, Safety Management System, Workplace accidents, Safety culture, Safety climate*

INTRODUCTION

The Indonesian workplace landscape in 2025 is marked by a sustained rise in occupational accidents with broad consequences for workers, families, and industrial productivity. Data presented during the National OSH Month indicate an upward trend from 298,137 cases (2022) to 370,747 cases (2023), reaching 356,383 cases by October 2024 (Sandi, 2025). Annual recapitulation further reports that total occupational accidents in 2024 exceeded 462,241 cases, signaling that safety risk remains a cross-sectoral problem rather than an issue confined to individual firms (DataIndonesia.id, 2025). These quantitative figures provide an objective indicator of urgency, as each additional case

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*Corresponding author : arum_tri@staff.gunadarma.ac.id

reflects a heightened likelihood of injury, fatality, lost work time, and social–economic burdens borne by households and the wider business ecosystem (Indonesia Safety Center, 2025).

OSH implementation has not consistently translated into a robust safety culture, leaving compliance at risk of becoming largely documentation driven. Reported cases reached 47,300 by April 2025 (≈12% higher year-on-year), with construction (29%), manufacturing (26%), and transport/logistics (18%) accounting for the largest shares signaling persistent vulnerabilities in high-risk sectors (Sandi, 2025). Labor-side reports recorded 323,652 cases by May 2025 and 4,410 occupational disease cases, while also warning that underreporting may cause official statistics to underestimate actual conditions (FSP FARKES R–KSPI, 2025). These patterns point to the need for a risk-based Safety Management System (SMS) hazard identification, occurrence reporting, risk management, performance measurement, and quality assurance so organizations learn from incidents and prevent recurrence rather than merely "passing audits" (Manawis, 2025).

Prior studies generally indicate that Occupational Health and Safety Management Systems (OHSMS)/SMS are associated with better safety outcomes particularly fewer accidents and injuries although effect sizes vary across sectors and measurement approaches. Construction evidence links sustained safety management to lower site accident rates (Khodeir & Dine, 2019), while large-organization assessments associate stronger system performance with less severe injury outcomes, including lower fatality and permanent disability indicators (Schaal, 2024). Findings from the hotel sector similarly relate OHSMS practices to reduced accidents through improved safety performance supported by knowledge, motivation, and technological innovation (Alsetoohy et al., 2026). In contrast, audit-based monitoring in a beverage company did not show a consistent direct link to accident reduction, suggesting the need to strengthen safety culture and procedural adherence to translate systems into outcomes (Musungwa & Kowe, 2022). Cost-focused evidence further suggests that prevention spending is connected to safety performance and employee satisfaction, which can reduce accident-related costs (Bayram et al., 2017).

System effectiveness is often attributed to OHSMS maturity and an organization's capacity for continuous improvement, suggesting that system adoption alone does not

explain variations in outcomes. A construction maturity model links PDCA-based continuous improvement and core managerial elements (e.g., commitment, standards, involvement, hazard management, resources, work environment) with stronger safety performance (Goggin et al., 2010). Manufacturing studies similarly frame high-performing OHSMS as an evolving managerial process grounded in Deming principles across strategic to operational levels (Mazur, 2015), while other maturity frameworks support benchmarking to explain heterogeneous performance among comparable firms (Franz et al., 2010). Sector-specific applications reinforce iterative review cycles in healthcare (Pugliese et al., 2011) and systematic risk-control improvement in mining via FMEA–AHP (Bao et al., 2017). Broader outcomes have also been associated with OHSMS maturity, including reduced employee stress and perceived benefits from integrating OSH with lean and environmental management systems (Vulanović et al., 2020; Mullins-Jaime, 2023). Evidence from municipal waste firms indicates uneven maturity profiles strong training and involvement but weaker policy and performance measurement highlighting the role of internal organizational factors (Battaglia et al., 2015), while quantitative tools such as AHP–fuzzy evaluation aid multi-level decision-making to strengthen OHSMS strategy and performance (Fertat & Cherkaoui, 2017).

Safety culture and safety climate are widely framed as the mechanisms that translate OHSMS from formal compliance into effective accident prevention. Safety climate is often used as an indicator of implementation quality because it reflects employees' perceptions of safety policies, procedures, and day-to-day practices (Clarke, 2009; Huang et al., 2006). Empirical evidence associates stronger safety climate with better safety performance and fewer adverse events, including lower accident rates in Thai food manufacturing and reduced near misses and injuries in the marble industry where communication and training are strengthened (Yangok & Choosong, 2018; Gümüş et al., 2023). Mediation models further suggest that safety climate affects injuries through employees' perceived safety control, underscoring the role of management commitment and training (Huang et al., 2006). Safety culture is positioned as a foundational, improvement-oriented capability linked to lower occupational risk and better adherence to safe practices, with evidence from high-risk oil and gas contexts emphasizing policy alignment to keep culture operational rather than symbolic (Saik et al., 2025; Ehiaguina et al., 2024). Governance approaches such as regulatory compliance and occupational risk

management are also reported to shape safety culture, while system dynamics studies indicate that culture- and management-focused interventions can reduce unsafe conditions and accidents (Lefranc et al., 2012; Küçük et al., 2024). Complementary findings highlight that culture and climate may act synergistically, with transformational leadership strengthening their relationship with safety performance and longitudinal evidence linking safety culture to both safety and financial performance (Asad et al., 2022; Bautista-Bernal et al., 2024).

This study aims to develop a Systematic Literature Review (SLR) that synthesizes evidence on the influence of OHSMS/Safety Management Systems on workplace accidents, injuries, and incidents, directly addressing prior inconsistencies, heterogeneous indicators, and fragmented mechanisms across sectors. The review maps and classifies cross-industry empirical evidence linking OHSMS to safety outcomes, identifies consistent versus divergent patterns, integrates maturity/system effectiveness/continuous improvement as explanatory lenses for implementation variability, and clarifies mechanisms involving safety culture and safety climate alongside mediators such as safety control, training, communication, and management commitment. The synthesis is designed to produce a consolidated conceptual framework and a focused research agenda that standardizes key indicators, identifies critical moderators (e.g., sectoral risk context, organizational setting, leadership), and generates actionable recommendations to move OHSMS implementation from administrative compliance toward measurable accident prevention impacts.

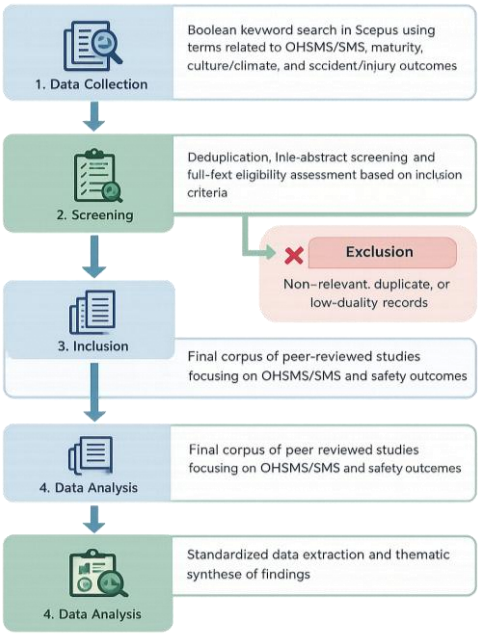
The central argument advanced in this SLR is that OHSMS/SMS implementation tends to reduce workplace accidents, injuries, and incidents, but the magnitude of effect depends on system maturity and the strength of continuous improvement practices (Goggin et al., 2010; Mazur, 2015; Battaglia et al., 2015). The relationship is expected to operate primarily through behavioral and cultural mechanisms, namely safety culture and safety climate, which increase employee safety control, procedural compliance, and safety participation, thereby lowering accident occurrence (Huang et al., 2006; Kim et al., 2019; Saik et al., 2025). Accordingly, the review advances three working hypotheses to be examined through evidence synthesis: effective OHSMS implementation is associated with lower accident outcomes across sectors (Khodeir & Dine, 2019; Schaal, 2024; Alsetoohy et al., 2026); the effect is strengthened by maturity and continuous

improvement (Franz et al., 2010; Pugliese et al., 2011); and safety culture/safety climate mediate the relationship, explaining variations in implementation effectiveness across organizations (Yangok & Choosong, 2018; Gümüş et al., 2023; Küçük et al., 2024).

METHODS

The present study adopts a systematic literature review (SLR) to examine how Occupational Health and Safety Management Systems (OHSMS)/Safety Management Systems (SMS) influence workplace accidents, injuries, and incidents across organizational and industry contexts. The unit of analysis is peer-reviewed scholarly publications that explicitly address OHSMS/SMS implementation and report safety-related outcomes (e.g., accident frequency, injury outcomes, incident rates, or severity indicators), including studies that operationalize system maturity, continuous improvement, and/or safety culture and safety climate as explanatory mechanisms or contextual factors.

An SLR design was selected because existing evidence on the OHSMS–accident relationship is dispersed across sectors and varies in terms of indicators and analytical approaches, making narrative synthesis without a systematic protocol vulnerable to selection bias. A structured review enables transparent and replicable identification, screening, and synthesis of studies, while allowing the literature to be organized into coherent analytical themes that reflect both outcome-focused effects (accident/injury reduction) and process-oriented explanations (maturity/continuous improvement and culture/climate mechanisms). This design is therefore appropriate for consolidating what is known, clarifying inconsistencies, and deriving a research agenda grounded in the cumulative evidence.



The data consist of secondary sources drawn from reputable bibliographic databases, with Scopus used as the primary indexing source to capture interdisciplinary OSH research spanning engineering, management, and occupational health. The review prioritizes journal articles and conference proceedings that provide sufficient methodological and results detail for extraction and synthesis. Records were limited to publications that include abstracts and key metadata needed to evaluate relevance and quality, and the final corpus was restricted to studies meeting the predefined inclusion criteria regarding topic fit, outcome reporting, and methodological clarity.

Data collection followed a protocol-based search and screening process. Boolean keyword strategies were constructed around three focal streams: (i) OHSMS/SMS and accident/injury/incident outcomes, (ii) maturity, system effectiveness, and continuous improvement, and (iii) safety culture/safety climate as mechanisms linked to occupational accident outcomes. Search outputs were exported for deduplication and screened in successive stages using title–abstract review followed by full-text eligibility assessment. Inclusion–exclusion decisions were guided by explicit criteria, such as the presence of OHSMS/SMS as a focal construct, reporting of safety outcomes, and sufficient description of methods and measures. The selection pathway was documented to maintain auditability and facilitate reproducibility (e.g., via a PRISMA-style flow description).

Data analysis combined structured extraction with thematic synthesis. Each eligible study was coded using a standardized extraction template capturing sector/context, study design, OHSMS/SMS definition and components, maturity/continuous improvement indicators, safety culture/safety climate variables (where applicable), outcome metrics (accident/injury/incident), and key findings. The extracted evidence was then synthesized thematically to identify convergent and divergent patterns across sectors, clarify how maturity and improvement cycles relate to effectiveness, and assess the extent to which culture/climate mechanisms mediate observed outcomes. The synthesized results were used to develop an integrative conceptual framework and to propose research and practice implications, including recommendations for more standardized indicators and clearer reporting of implementation quality in future OHSMS/SMS studies.

RESULTS AND DISCUSSION

OHSMS/SMS and measurable safety outcomes

The reviewed studies consistently examined OHSMS/SMS as an organizational intervention and linked it to safety outcomes such as accident frequency, injury outcomes, incident rates, severity indicators, and accident-related costs. Evidence from construction suggests that sustained safety management introduced early in the project lifecycle is associated with lower site accident rates (Khodeir & Dine, 2019). In large organizational contexts, stronger safety system performance assessed through inspections and formal evaluations is associated with less severe injury outcomes, including reduced fatality and permanent disability indicators (Schaal, 2024). Service settings such as hotels similarly report reduced workplace accidents through improved safety performance supported by safety knowledge, motivation, and technological innovation (Alsetoohy et al., 2026). Mixed results remain evident where audit-based monitoring of OHSMS implementation did not consistently show a direct relationship with accident reduction in the beverage industry, indicating that culture strengthening and procedural adherence may be required to translate systems into outcomes (Musungwa & Kowe, 2022). Cost-focused evidence complements these findings by showing that prevention expenditures relate to safety performance and employee satisfaction, which are associated with lower accident costs (Bayram et al., 2017).

Table 1. Outcome-oriented evidence linking OHSMS/SMS to accidents, injuries, and incidents

Study	Sector/Context	Outcome focus	Main finding
Khodeir & Dine (2019)	Construction	Site accidents	OHSMS-related strategies associated with fewer accidents
Schaal (2024)	Large organization / safety assessment	Injury rates and severity	Higher system performance associated with less severe outcomes
Alsetoohy et al. (2026)	Hotels	Workplace accidents / safety outcomes	OHSMS practices associated with improved safety outcomes
Musungwa & Kowe (2022)	Beverage manufacturing	Accident prevention	Audit-based monitoring not consistently linked to accident reduction
Bayram et al. (2017)	General / cost-performance model	Accident costs	Prevention costs link to performance/satisfaction and lower accident costs

Across these studies, the dominant pattern indicates positive associations between OHSMS/SMS and improved safety outcomes, while the inconsistencies point to implementation quality and measurement differences as likely sources of variation in reported effects.

OHSMS maturity, system effectiveness, and continuous improvement

A second body of evidence explains effectiveness through system maturity and the organization's capacity for continuous improvement, indicating that adoption alone is insufficient to account for differences in outcomes. A construction-sector maturity model links PDCA-based continuous improvement and core managerial elements (management commitment, standards, worker involvement, hazard management, resources, and work environment) to stronger safety performance (Goggin et al., 2010). Manufacturing studies similarly frame high-performing OHSMS as an evolving managerial process grounded in Deming principles across strategic, tactical, and operational levels (Mazur, 2015). Other maturity frameworks emphasize benchmarking to explain heterogeneous performance among firms that appear comparable in structure or sector (Franz et al., 2010). Sector

applications reinforce iterative review cycles in healthcare systems (Pugliese et al., 2011) and systematic risk-control improvement in mining through integrated risk assessment approaches such as FMEA–AHP (Bao et al., 2017). Broader organizational outcomes have also been associated with maturity, including reduced employee stress linked to improved organizational performance and perceived benefits from integrating OSH with lean and environmental management systems (Vulanović et al., 2020; Mullins-Jaime, 2023). Evidence from municipal waste firms further indicates uneven maturity profiles strong training and involvement but weaker policy and performance measurement highlighting the role of internal organizational factors (Battaglia et al., 2015). Quantitative maturity tools (e.g., AHP–fuzzy evaluation) are also used to support managerial decisions for prioritizing system improvements (Fertat & Cherkaoui, 2017).

Table 2. Evidence on OHSMS maturity and continuous improvement

Study	Sector/Context	Maturity/CI approach	Key implication
Goggin et al. (2010)	Construction	PDCA-based maturity model	Higher maturity aligns with better safety performance
Mazur (2015)	Manufacturing	Deming-based "excellent" OHSMS model	OHSMS effectiveness depends on multi-level improvement
Franz et al. (2010)	General / benchmarking	Maturity evaluation framework	Explains heterogeneous performance among similar firms
Pugliese et al. (2011)	Healthcare	Roadmap from review to management review	Effectiveness built through iterative cycles
Bao et al. (2017)	Mining	FMEA–AHP for occupational risk	Supports systematic improvement in risk control
Battaglia et al. (2015)	Municipal waste	Maturity profiling	Internal factors drive uneven maturity components
Fertat & Cherkaoui (2017)	General	AHP–fuzzy evaluation	Decision support for maturity prioritization

Collectively, these findings suggest that continuous improvement structures, performance measurement, and internal organizational capabilities are central to understanding why OHSMS is effective in some contexts but less impactful in others.

Safety culture and safety climate as mechanisms linking OHSMS to accident reduction

Safety culture and safety climate emerge as the mechanisms that translate OHSMS from formal systems into effective accident prevention. Safety climate is often treated as an indicator of implementation quality because it reflects employees' perceptions of safety policies, procedures, and day-to-day practices (Clarke, 2009; Huang et al., 2006). Empirical evidence associates stronger safety climate with better safety performance and fewer adverse events, including lower accident rates in Thai food manufacturing and reduced near misses and injuries in the marble industry where communication and training are strengthened (Yangok & Choosong, 2018; Gümüş et al., 2023). Mediation models further suggest that safety climate affects injuries through employees' perceived safety control, underscoring the role of management commitment and training (Huang et al., 2006).

Safety culture is positioned as a foundational, improvement-oriented capability linked to lower occupational risk and better adherence to safe practices, with evidence from high-risk oil and gas contexts emphasizing policy alignment to keep culture operational rather than symbolic (Saik et al., 2025; Ehiaguina et al., 2024). Governance approaches such as regulatory compliance and occupational risk management are also reported to shape safety culture, while system dynamics studies indicate that culture- and management-focused interventions can reduce unsafe conditions and accidents (Lefranc et al., 2012; Küçük et al., 2024). Complementary findings highlight that culture and climate may act synergistically, with transformational leadership strengthening their relationship with safety performance and longitudinal evidence linking safety culture to both safety and financial performance (Asad et al., 2022; Bautista-Bernal et al., 2024).

Table 3. Evidence on culture/climate mechanisms and accident outcomes

Study	Context	Mechanism tested	Outcome linkage	Main takeaway
Huang et al. (2006)	General	Climate → safety control (mediation)	Injuries	Perceived control explains climate–injury link
Yangok &	Food manufacturing	Safety climate dimensions	Accidents	Higher climate associated

Chooson g (2018)				with fewer accidents
Gümüş et al. (2023)	Marble industry	Communication/traini ng	Near misses, injuries	Stronger climate relates to fewer events
Saik et al. (2025)	General	Safety culture and risk level	Occupational risk	Stronger culture linked to lower risk
Ehiaguin a et al. (2024)	Oil & gas	Culture–behavior alignment	Safety performance	Policy alignment needed for operative culture
Lefranc et al. (2012)	Governance	Compliance/risk management shaping culture	Culture	Governance can shape safety culture
Küçük et al. (2024)	System dynamics	Culture & management interventions	Accidents/unsaf e conditions	Scenarios reduce unsafe situations and accidents
Asad et al. (2022)	SMEs	Leadership moderation	Safety performance	Leadership strengthens culture/climat e effects
Bautista-Bernal et al. (2024)	Longitudinal	Culture–performance linkage	Safety + financial	Culture relates to safety and financial outcomes

Overall, the mechanism-focused evidence indicates that OHSMS/SMS effects on accident reduction are more likely to be realized when systems actively strengthen safety climate and culture through communication, training, perceived safety control, and aligned governance and leadership.

DISCUSSION

This systematic literature review synthesized empirical evidence on how Occupational Health and Safety Management Systems (OHSMS)/Safety Management Systems (SMS) influence workplace accidents, injuries, and incidents, with particular attention to system maturity/continuous improvement and the mediating role of safety

culture and safety climate. Three core findings emerged. First, OHSMS/SMS implementation is generally associated with improved safety outcomes, including fewer accidents and less severe injury consequences, although results vary by sector and by how implementation and outcomes are measured (Khodeir & Dine, 2019; Schaal, 2024; Alsetoohy et al., 2026). Second, the literature indicates that system maturity and continuous improvement capabilities explain much of this variability; organizations with PDCA-oriented improvement cycles, stronger performance measurement, and robust internal governance tend to report better safety performance than those relying on compliance-driven routines (Goggin et al., 2010; Mazur, 2015; Battaglia et al., 2015). Third, safety culture and safety climate operate as key mechanisms that convert formal systems into real prevention effects, linking OHSMS quality to safety behaviors and, ultimately, to reduced accidents and injuries (Huang et al., 2006; Yangok & Choosong, 2018; Gümüş et al., 2023).

The pattern of results can be explained by the fact that OHSMS/SMS functions as a socio-technical control system rather than a purely administrative framework. When implementation quality is high, OHSMS creates reliable routines for hazard identification, risk control, learning from incidents, and corrective actions; these routines reshape employee perceptions (safety climate), reinforce norms (safety culture), and increase perceived safety control, compliance, and participation, which together reduce exposure to unsafe conditions and prevent incidents (Huang et al., 2006; Küçük et al., 2024). Conversely, when implementation is driven primarily by documentation and audit compliance, the system may improve formal readiness without changing frontline behavior, explaining why audit-based approaches sometimes fail to show consistent direct links to accident reduction (Musungwa & Kowe, 2022). The maturity literature further clarifies this mechanism: continuous improvement cycles, multi-level managerial involvement, and measurement systems are the operational “engine” that keeps controls effective over time and across changing conditions, thereby sustaining prevention impact (Goggin et al., 2010; Franz et al., 2010; Pugliese et al., 2011).

Comparison with prior studies indicates strong alignment with earlier arguments that safety outcomes are shaped not only by rules and procedures, but also by organizational culture and climate. Evidence linking safety climate to accident outcomes and to mediators such as safety control is consistent with established models of climate–

behavior–injury pathways (Huang et al., 2006), and the sector-based findings in manufacturing contexts support the broader proposition that communication and training are practical levers for improving climate and reducing adverse events (Yangok & Choosong, 2018; Gümüş et al., 2023). This review extends prior work by integrating these mechanism studies with maturity-focused evidence, showing that maturity and continuous improvement provide a plausible explanation for why nominally similar OHSMS implementations yield heterogeneous results across organizations (Franz et al., 2010; Battaglia et al., 2015). In addition, the synthesis draws attention to the limited explanatory power of audit-only proxies for "implementation," positioning measurement choice as a major reason for inconsistent findings in parts of the literature (Musungwa & Kowe, 2022).

The results carry broader implications for understanding OSH challenges as both a safety and governance issue. At a societal level, persistent accident burdens imply that safety systems cannot be treated solely as compliance artifacts; they require institutional learning, credible measurement, and a culture of reporting and improvement to be effective. Evidence that safety culture is associated with occupational risk reduction and that policy alignment matters in high-risk industries highlights the ideological tension between compliance symbolism and operational protection (Ehiaguina et al., 2024; Saik et al., 2025). The linkage between safety culture, safety performance, and financial performance also suggests that safety is not merely a cost center but can function as an organizational capability supporting sustainability and competitiveness (Bautista-Bernal et al., 2024). From an economic perspective, the relationship between prevention costs, satisfaction, and accident costs implies that investments in system quality and workforce engagement may yield measurable returns through reduced losses and improved productivity (Bayram et al., 2017).

Reflection on potential functions and dysfunctions reinforces that OHSMS/SMS can generate both benefits and risks depending on how it is enacted. A functional system strengthens prevention, clarifies accountability, improves reporting and learning, and supports long-term risk governance; it may also improve employee well-being and reduce stress-related performance impacts (Vulanović et al., 2020). A dysfunctional system, however, can institutionalize "paper compliance," diverting attention to audit readiness rather than hazard control, producing false assurance and masking underreporting or weak

learning loops (Musungwa & Kowe, 2022). Over-reliance on formal indicators without strong measurement and feedback can also concentrate efforts on easily auditable activities (e.g., documentation, training attendance) while neglecting harder-to-measure domains such as quality of supervision, informal norms, and actual control effectiveness (Battaglia et al., 2015). These trade-offs underscore the importance of maturity-oriented implementation that prioritizes operational controls and learning outcomes rather than certification as an endpoint.

Actionable implications point to policies and organizational practices that align with the evidence synthesized in this review. Organizations should prioritize maturity-building actions: visible management commitment, worker involvement mechanisms, systematic hazard management, and PDCA-based continuous improvement supported by performance measurement and management review (Goggin et al., 2010; Mazur, 2015; Pugliese et al., 2011). Regulatory and industry stakeholders should complement compliance auditing with capability-oriented assessments that evaluate learning processes, reporting quality, corrective action closure, and leading indicators of safety culture and climate (Clarke, 2009; Lefranc et al., 2012). Training and communication should be treated as ongoing operational levers rather than one-off interventions, particularly because they strengthen safety climate and perceived safety control, which are repeatedly associated with improved outcomes (Huang et al., 2006; Gümüş et al., 2023). In high-risk sectors, governance should emphasize policy alignment and credible enforcement to prevent safety culture from becoming symbolic, while leadership development especially transformational leadership can be leveraged to amplify culture/climate effects in SMEs and resource-constrained settings (Ehiaguina et al., 2024; Asad et al., 2022). Finally, given evidence linking safety and financial performance, decision-makers can frame OHSMS investments as strategic risk governance that protects workers while supporting operational resilience and organizational sustainability (Bautista-Bernal et al., 2024; Bayram et al., 2017).

CONCLUSIONS

This systematic literature review underscores a central insight: OHSMS/Safety Management Systems are generally linked to improved safety outcomes, yet sustained reductions in workplace accidents, injuries, and incidents depend more on

implementation quality than on formal system adoption alone. The evidence indicates that prevention benefits are most credible when organizations operate mature systems with continuous improvement routines and when the system actively strengthens safety culture and safety climate through effective training, communication, reporting, learning, and corrective actions so that risks are controlled before they escalate into harm.

The study contributes to the scholarly discussion by integrating three previously fragmented streams of evidence into a single explanatory account. First, it consolidates outcome-focused findings on accident and injury reduction. Second, it elevates maturity and continuous improvement as key lenses for explaining why similar systems can produce different results across organizations. Third, it positions safety culture and safety climate as mechanisms that translate formal management systems into safer behaviors and measurable outcomes. Through this synthesis, the review offers a coherent conceptual pathway and a structured agenda for future research, emphasizing the need for clearer operationalization of implementation quality, more comparable outcome indicators, and explicit testing of mediators and moderators across contexts.

Several limitations should be acknowledged. The review is constrained by the scope of the selected database(s), variation in study quality, and differences in reporting practices across industries and countries. Heterogeneity in outcome measures (e.g., accident counts, severity indicators, self-reported injuries, or cost measures) and in definitions of maturity and culture/climate limits direct comparability and prevents firm conclusions about effect sizes. In addition, many studies are context-specific, which may reduce generalizability. Future research should prioritize multi-sector and multi-country comparative designs, more consistent use of leading and lagging safety indicators, and stronger causal approaches particularly longitudinal and quasi-experimental studies that explicitly test maturity and culture/climate as mediators and moderators of OHSMS effectiveness.

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