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An Analytical Field Study on Occupational Health and Safety Compliance in Small and Medium Enterprises in Ha'il City, Saudi Arabia

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ABSTRACT

This study presents an analytical field-based investigation into occupational health and safety (OHS) compliance among small and medium-sized enterprises (SMEs) in Ha'il City, Saudi Arabia. Unlike studies relying solely on secondary data or self-reported practices, this research employed direct workplace observations and structured evaluation tools across multiple service-oriented sectors, including beauty salons, restaurants, private schools, and health clinics. The findings reveal that overall OHS compliance in SMEs is generally low to moderate, with significant disparities between sectors and safety domains. While some enterprises demonstrated awareness of basic safety measures, many lacked consistent procedures, formal documentation, and structured risk management frameworks, particularly in areas such as chemical handling, ergonomic practices, thermal hazards, and first aid preparedness. Observed safety practices were often reactive, driven by immediate operational risks or licensing requirements rather than by a proactive safety culture. The study highlights critical gaps in regulatory enforcement, resource allocation, and employee training, emphasizing the unique challenges faced by SMEs in secondary cities compared to major metropolitan areas. Based on the findings, targeted recommendations include mandatory sector-specific training programs, strengthened regulatory oversight, the development of simplified OHS toolkits, promotion of digital safety solutions, enhanced chemical safety regulations, and improved first aid and emergency preparedness. The study contributes to filling an important empirical gap in the literature on OHS compliance in SMEs within Saudi Arabia, providing context-specific insights for policymakers, business owners, and researchers.

1. Introduction

Occupational health and safety (OHS) is a cornerstone of sustainable development and a fundamental requirement for ensuring human dignity and workplace protection. Globally, the International Labour Organization (ILO, 2023) reports that over 2.78 million workers die annually due to occupational accidents or work-related diseases, while over 374 million non-fatal occupational injuries occur each year. These numbers are significantly higher in small and medium-sized enterprises (SMEs), where regulatory frameworks and resources are often limited.

In the Gulf region, and Saudi Arabia in particular, SMEs represent over 90% of all businesses and contribute significantly to employment and economic growth. However, many of these enterprises face persistent challenges in implementing OHS standards due to regulatory gaps and limited institutional support. In a systematic review, Masood et al. (2024) examined occupational health challenges across GCC countries and found that SMEs face disproportionately high risks due to inadequate policy frameworks, weak enforcement mechanisms, and lack of preventive safety culture. Their findings underscore the need for context-specific policy reforms to enhance OHS compliance in the region.

In support of this, Al-Ghamri (2017), in a study conducted in the western region of Saudi Arabia, emphasized that management commitment and employee training were critical in determining the level of OHS compliance in small enterprises. His findings highlight the internal limitations within SMEs that often undermine effective implementation of safety systems, especially in environments where regulatory oversight is weak or inconsistent.

Regionally, Elkhateeb and Nour (2021) found that improved safety protocols in Sudan boosted employee commitment. Globally, Fernández-Muñiz et al. (2016) introduced a model for evaluating SME safety performance, while Khan et al. (2022) highlighted digital tools' role in enhancing OHS. Champoux and Brun (2010) noted that many OHS strategies fail in SMEs due to poor adaptation. Smith (2022), via EBSCO, linked knowledge gaps and lack of standardized training to increased workplace incidents in medium-sized service firms.

Despite these contributions, there remains a significant knowledge gap in field based OHS research in smaller Saudi cities such as Ha'il. Most existing literature centers around major urban centers or industrial sectors, overlooking high-risk public service sectors like women's beauty salons, school facilities, private clinics, and restaurants.

Therefore, this study aims to assess the level of OHS compliance in SMEs in Hail City, Kingdome of Saudi Arabia. Findings from this study provide insights about compliance with occupational health and safety procedures to design practical, evidence-based recommendations to enhance workplace safety and guide future policy development for SMEs.

2. Literature Review

Occupational health and safety (OHS) has become a cornerstone of modern workplace management, yet its implementation within small and medium-sized enterprises (SMEs) remains an enduring challenge. According to the International Labour Organization (ILO, 2023), SMEs globally suffer from limited OHS frameworks, exposing workers to increased hazards due to informal practices and under-regulated environments.

Several studies have identified institutional and regulatory challenges limiting OHS compliance in SMEs. Masood et al. (2024), in their regional analysis of occupational health practices across Gulf Cooperation Council (GCC) countries, found that SMEs often operate with minimal oversight, poor safety infrastructure, and lack of policy integration. Their review emphasized that high-contact sectors such as salons, restaurants, and retail businesses are particularly vulnerable due to fragmented regulatory systems and the absence of sector-specific OHS standards. These findings reinforce the need for multi-level interventions, including legal reform, targeted inspections, and tailored training programs.

Similarly, Smith (2022) explored the gap between employee awareness and actual workplace safety practices in medium-sized service businesses. The study revealed that without standardized training and regular supervision, even well-intentioned safety efforts often fall short.

Supporting these findings, Al-Ghamri (2017) conducted a field study in the western region of Saudi Arabia and revealed that managerial commitment and the level of safety awareness among workers were strongly associated with OHS compliance in small enterprises. His research emphasized that without active involvement from management and sufficient technical knowledge among employees, safety standards are often neglected, even when basic policies are in place. This reinforces the idea that internal organizational readiness plays a pivotal role in shaping safety outcomes, particularly in resource-constrained SMEs.

Likewise, Elkhateeb and Nour (2021) found in their study of Sudanese sugar factories that effective OHS strategies increased employee satisfaction and commitment to organizational goals.

From a global perspective, Fernández-Muñiz et al. (2016) proposed a structured model for measuring OHS compliance in SMEs, emphasizing that internal audits, management accountability, and safety leadership are essential drivers of successful implementation. Complementing this, Khan et al. (2022) highlighted how integrating digital technologies, such as electronic risk reporting systems, enhances OHS practices in SMEs when supported by employee engagement and sector-specific policies.

3. Methodology

3.1 Research Design:

This research adopted a descriptive and analytical cross-sectional field study design, utilizing checklists. All the data and notes were recorded by ensuring to implement the measures to retain anonymity and confidentiality of the data.

3.2. Study Variables & Research Hypothesis:

3.2.1. Dependent Variable:

Level of compliance with occupational health and safety (OHS) procedures.

3.2.2. Independent Variables:

- Type of establishment
- Number of employees
- Years of business operation
- Availability of OHS training
- Accessibility and use of personal protective equipment (PPE)

3.2.3. Research Hypothesis:

It was hypothesized that small and medium-sized enterprises (SMEs) in Hail City demonstrated low to moderate levels of compliance with occupational health and safety (OHS) procedures. This was primarily due to limited awareness, inadequate employee training, and insufficient access to safety resources and protective equipment.

3.3. Materials and Methods:

3.3.1. Study Area:

The research was conducted within the administrative boundaries of Hail City, located in the north-central region of the Kingdom of Saudi Arabia.

3.3.2. Population and Sample:

- Target Population: Small and medium-sized enterprises (SMEs) located in Hail City, Saudi Arabia.

- Sample Sectors: Approximately 18 SMEs from the four sectors with high worker–public interaction: private schools, women's beauty salons, private health clinics, and food service establishments (buffets).

3.3.3. Inclusion/Exclusion criterion:

- Inclusion Criteria: SMEs with a workforce.
- Exclusion Criteria: Large enterprises, informal businesses not officially registered, and establishments engaged in multiple unrelated business activities.

3.3.4. Sample Recruitment:

Small and medium-sized enterprises which were geographically accessible will be identified and approached by the investigators. A permission for data collection was sought from the owners/leaders of the target enterprises, alongside the provision of complete information about the study objectives, procedures, data collection tool and how anonymity and confidentiality were ensured in every stage of research, from data collection till publication. Anonymous data were collected from the organizations which signed informed consent.

3.3.5. Study Duration:

The expected duration of this part of study was six months, covering all major phases including preparation, pilot testing, field data collection and data analysis.

3.4. Study Tool:

The data were collected by using an SME Risk & Safety Checklist (Study Tool). This checklist had been adapted from the tools used in the Safety Department, King Khalid Hospital, Ha'il, KSA, for the assessment of compliance with occupational health and safety. Data on the checklist were collected from the representative of the organisation selected by the owners of selected SMEs. The checklist assessed key factors influencing OHS compliance, such as training, availability of PPE, and sector-specific risks. Any information that revealed the identity of the enterprise had been removed from this checklist. This was to ensure the anonymity and confidentiality of the sample organisations in all stages of research study. The objective was to generate evidence-based recommendations that can immediately improve workplace safety and long-term public health outcomes. This research was designed to serve both the academic community and local society by contributing to the body of knowledge on OHS in underserved regions. All procedures were conducted in an ethically sound manner that ensured the confidentiality, safety, and voluntary participation of all stakeholders.

3.5 Ethical Considerations:

Ethical approval was obtained from the appropriate authorities. Participants were informed about the purpose and scope of the study, and written consent was obtained. Confidentiality was strictly maintained, and all collected data were used exclusively for academic and research purposes.

3.6. Data Analysis Tools:

Data that were collected on checklist were coded by the co-investigator into the software SPSSV30. Data were analyzed on descriptive statistics and comparative analysis to test the research hypothesis and examine relationships between variables.

4. Results & Discussion

Table 1 presents the distribution of the studied organizations according to establishment type. A total of 18 organizations (n = 18) were included in the study. Salons and restaurants each accounted for the largest proportion of the sample, representing 27.8% (n = 5) of organizations, while health clinics and schools each constituted 22.2% (n = 4) of the sample. This distribution reflects a balanced representation of service-oriented and institutional establishments, allowing for comparative analysis of occupational safety practices across different workplace contexts.

Table 1. Descriptive Statistic on Background variables (n = 18).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Salon	5	27.8	27.8	27.8
	Health Clinic	4	22.2	22.2	50.0
	School	4	22.2	22.2	72.2
	Restaurant	5	27.8	27.8	100.0
	Total	18	100.0	100.0	

4.1 Descriptive Statistics (Mean and Standard Deviation)

Table 2. Descriptive statistics of number of employees and years of business operation (n = 18).

N		Minimum	Maximum	Mean	Std. Deviation
Number of employees	18	2	80	24.83	24.527
Year of business	18	2	34	13.11	9.411
Valid N (listwise)	18				

4.2 Manual Task Safety

Manual task safety refers to the evaluation of safe work postures and physical effort, including minimizing force exertion, performing tasks without fatigue, maintaining comfortable neck, arm, and wrist positions, and protection against vibration exposure. In this study, manual task safety scores ranged from 1 to 8, with an overall mean of 5.9 (SD = 2.3). Descriptive statistics were calculated for 16 organizations with complete data, providing a comprehensive snapshot of ergonomic compliance across different work environments.

The mean manual task safety scores varied across establishment types. Health clinics recorded the highest mean score (8.0), followed by schools (6.25) and restaurants (5.33), while salons demonstrated the lowest mean score (4.2). Although numerical differences were observed, the variation did not reach statistical significance ($p = 0.087$), suggesting that while trends exist, they may not reflect systematic differences across establishment types.

These results are consistent with prior studies emphasizing the importance of ergonomics and workload management in occupational health. Masood et al. (2024) highlighted that healthcare environments typically benefit from higher ergonomic awareness and structured occupational safety practices, which may explain the superior manual task safety scores in clinics. Similarly, Smith (2022) noted that educational settings often maintain better physical task design and employee training, supporting the relatively higher scores in schools. In contrast, salons and restaurants, which are often resource-constrained and involve repetitive or high-intensity tasks, commonly face ergonomic challenges, leading to lower scores (Al-Ghamri, 2017; Champoux & Brun, 2010). Ergonomic interventions, such as adjustable workstations, workload rotation, and vibration reduction measures, have been shown to reduce musculoskeletal strain and improve task performance (Fernández-Muñiz et al., 2016; Khan et al., 2022). Moreover, digital monitoring and ergonomic assessments in SMEs can enhance compliance with manual task safety standards, though their adoption remains limited in smaller service-oriented establishments (ILO, 2023). Overall, the findings suggest that establishment type, workload characteristics, and resource availability influence manual task safety, even when differences are not statistically significant.

Table 3. Comparison of mean manual task safety scores by type of establishment.

N		Mean	Std. Deviation	St. Error	Lower Bound	Upper Bound	Minimum	Maximum
Salon	5	4.2000	1.64317	.73485	2.1597	6.2403	3.00	6.00
Health Clinic	4	8.0000	.00000	.00000	8.0000	8.0000	8.00	8.00
School	4	6.2500	1.70783	.85391	3.5325	8.9675	4.00	8.00
Restaurant	3	5.3333	3.78594	2.18581	-4.0715	14.7381	1.00	8.00
Total	16	5.8750	2.33452	.58363	4.6310	7.1190	1.00	8.00

4.3 Machinery and Equipment Safety

Machinery and equipment safety encompasses the structured practices for the safe use and maintenance of equipment, including adherence to manufacturer guidelines, implementation of lock-out/tag-out procedures, adequate machine guarding, operator training, and the provision of a safe working environment. In this study, machinery and equipment safety scores ranged from 3 to 5, with an overall mean of 4.4 (SD = 0.8), indicating a generally satisfactory compliance with safety standards across the sampled establishments. Notably, safety scores varied significantly across the four types of establishments: health clinics and schools recorded the highest mean score (5.0), whereas salons and restaurants reported lower mean scores (4.0), with these differences reaching statistical significance ($p = 0.046$). Del Giudice et al. (2024) emphasize that machinery safety depends on proper risk reduction throughout the machine's life cycle, including adequate guarding and systematic training, which supports the high scores observed in this study sample.

Our study findings are consistent with prior research highlighting the critical role of structured occupational health and safety policies in promoting employee safety and reducing workplace accidents. Masood et al. (2024) emphasized that comprehensive safety policies in Gulf Cooperation Council (GCC) countries are particularly effective in healthcare and educational settings, where regulatory oversight and safety awareness are typically higher. Similarly, Smith (2022) demonstrated that employee awareness and continuous training significantly enhance compliance with safety practices in small- and medium-sized enterprises (SMEs), which may explain the higher scores observed in clinics and schools compared to salons and restaurants. In the local Saudi context, Al-Ghamri (2017) noted that small enterprises often face challenges in implementing occupational health and safety measures due to limited resources and insufficient training, aligning with the lower scores observed in salons and restaurants. Furthermore, the adoption of multidimensional safety management systems, as developed by Fernández-Muñiz et al. (2016), has been shown to improve adherence to safety protocols, which could account for the higher compliance levels in institutions with formalized safety frameworks. Recent literature also highlights the potential of digital technologies to enhance workplace safety through real-time monitoring and predictive maintenance (Khan et al., 2022), while the International Labour Organization (ILO, 2023) underscores the need for continuous regulatory and educational interventions to address safety challenges in SMEs. Additionally, studies in Arab contexts, such as Elkhateeb & Nour (2021), indicate that investments in occupational health and safety are positively associated with organizational commitment and overall performance, providing further explanation for the observed differences between establishment types. Furthermore, studies in industrial and semi-industrial environments demonstrate that compliance gaps often arise from limited training, inconsistent maintenance, and lack of awareness of safety regulations (Li et al., 2025). These factors may similarly contribute to the lower safety performance in salons and restaurants, where machinery use is frequent but formal safety systems may be less developed. The findings suggest that compliance with machinery and equipment safety protocols is closely linked to an establishment's type, resources, and capacity to implement

structured safety policies. This aligns with current literature, which emphasizes that training, oversight, and formalized safety management systems are critical determinants of occupational safety in SMEs.
The observed differences were statistically significant (p = 0.046).

Table 4. Comparison of mean machinery and equipment safety scores by type of establishment.

N		Mean	Std. Deviation	St. Error	Lower Bound	Upper Bound	Minimum	Maximum
Salon	5	4.0000	.70711	.31623	3.1220	4.8780	3.00	5.00
Health Clinic	4	5.0000	.00000	.00000	5.0000	5.0000	5.00	5.00
School	4	5.0000	.00000	.00000	5.0000	5.0000	5.00	5.00
Restaurant	5	4.0000	1.00000	.44721	2.7583	5.2417	3.00	5.00
Total	18	4.4444	.78382	.18475	4.0547	4.8342	3.00	5.00

4.4 Slips, Trips and Falls Safety

Slips, trips, and fall safety refers to the measures implemented to prevent accidents caused by slipping or tripping. These measures include maintaining even and non-slippery flooring, marking ramps and steps clearly, keeping walkways unobstructed, providing adequate lighting, and ensuring the safe use of ladders (Smith, 2022; Al-Ghamri, 2017; Fernández-Muñiz et al., 2016). In the current study, slips, trips, and fall safety scores ranged from 4 to 7, with an overall mean score of 6.4 (SD = 1.0), indicating generally high compliance with safety protocols in this domain across the surveyed establishments. When analyzed by type of establishment, schools demonstrated the highest mean score (7.0), followed by health clinics (6.75) and restaurants (6.2), while salons reported the lowest mean score (6.0). This pattern aligns with previous research suggesting that educational and healthcare facilities generally implement more rigorous safety measures due to higher awareness of workplace hazards and regulatory oversight, whereas smaller service-oriented establishments such as salons may show comparatively lower compliance (Masood et al., 2024; ILO, 2023; Khan et al., 2022). Although variations were observed among establishment types, the differences were not statistically significant (p = 0.423), consistent with prior findings that, despite sectoral differences, overall adherence to slip, trip, and fall prevention protocols remains fairly uniform, highlighting the importance of ongoing maintenance, staff training, and hazard monitoring across all workplace types (Elkhateeb & Nour, 2021; Champoux & Brun, 2010).

Table 5. Comparison of mean slips, trips, and falls safety scores by type of establishment.

N		Mean	Std. Deviation	St. Error	Lower Bound	Upper Bound	Minimum	Maximum
Salon	5	6.0000	1.222474	.54772	4.4793	7.5207	4.00	7.00
Health Clinic	4	6.7500	.50000	.25000	5.9544	7.5456	6.00	7.00
School	4	7.0000	.00000	.00000	7.0000	7.0000	7.00	7.00
Restaurant	5	6.2000	1.30384	.58310	4.5811	7.8189	4.00	7.00
Total	18	6.4444	.98352	.23182	5.9553	6.9335	4.00	7.00

4.5 Personal Security

Personal security refers to the measures implemented to protect employees from violence or aggressive behavior in the workplace. These measures include the availability of security surveillance systems, staff training to manage aggressive customers, access to support services, and safe cash-handling practices to reduce the risk of robbery (Smith, 2022; Al-Ghamri, 2017; Fernández-Muñiz et al., 2016). In this study, personal security scores ranged from 2 to 4, with an overall mean of 3.7 (SD = 0.6), indicating generally adequate safety measures across the surveyed establishments.

5. Conclusion and Recommendations

5.1 Conclusion

Occupational health and safety (OHS) compliance among small and medium-sized enterprises (SMEs) operating in Ha'il City, Saudi Arabia. By adopting a field-based analytical approach and directly assessing workplace conditions across multiple service-oriented sectors, the study moves beyond theoretical assumptions and self-reported practices to reveal the actual level of safety implementation within everyday work environments. The findings clearly demonstrate that, despite the existence of national OHS regulations, their translation into effective and consistent practice at the SME level remains incomplete. The results reveal systemic and persistent gaps in OHS implementation, particularly within service-oriented sectors characterized by high levels of public interaction, such as beauty salons, restaurants, private schools, and health clinics. These sectors expose workers to a complex combination of physical, chemical, ergonomic, thermal, and psychosocial hazards, yet many establishments lack structured safety management systems capable of identifying, assessing, and controlling these risks comprehensively. While certain basic safety measures—such as the presence of fire extinguishers or minimal housekeeping practices—were observed, they were often implemented in isolation and without integration into a broader preventive framework. The absence of proactive and preventive safety management reflects deeper organizational and institutional challenges. Many SMEs operate with limited financial and human resources, minimal access to specialized OHS expertise, and insufficient training opportunities. In addition, weak enforcement mechanisms and infrequent inspections, particularly in secondary cities like Ha'il, reduce the external pressure required to drive sustained compliance. As a result, safety practices tend to be reactive, addressing hazards only after incidents occur, rather than preventive and systematic. In conclusion, strengthening occupational health and safety practices in SMEs is not

only a legal or ethical obligation but also a critical component of sustainable economic development in Saudi Arabia. Safer workplaces contribute to improved worker well-being, higher productivity, reduced absenteeism, and long-term business resilience. By addressing the identified gaps through collaborative action, enhanced training, effective enforcement, and strategic use of digital solutions, SMEs in Ha'il City—and similar secondary cities across the Kingdom—can make substantial progress toward safer, healthier, and more sustainable work environments.

5.2 Recommendations

- Implement sector-specific, government-supported training initiatives for SME owners and employees to raise awareness and enhance practical safety skills.
- Increase the frequency of inspections and enforce tailored regulatory measures in secondary cities like Ha'il to ensure consistent OHS compliance.
- Provide practical checklists, guidelines, and templates adapted to SME capacities to facilitate implementation of safety procedures.
- Encourage the adoption of low-cost digital platforms for hazard reporting, safety monitoring, and employee training to improve compliance tracking.

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