Frontiers in Health Informatics
ISSN-Online: 2676-7104
www.healthinformaticsjournal.com
2024; Vol 13: Issue 8
Open Access

Occupational health and safety management in logistics, Mainly Warehouses & depots In Saudi Arabia

Mohammed Adel Yamani[1], Mohammed Abdullah Al-Mekhlafi[2]
[1]Area HSSE Manager Maersk Saudi Arabia MBA, University of Business and Technology, Jeddah
Bachelor's Degree in Administrative Sciences, King Abdulaziz University
[2]Assistant Professor of Accounting, College of Business Administration, University of Business and Technology, Jeddah, Kingdom of Saudi Arabia

Cite this paper as: Mohammed Adel Yamani, Mohammed Abdullah Al-Mekhlafi (2024). Occupational health and safety management in logistics, Mainly Warehouses & depots In Saudi Arabia. *Frontiers in Health Informatics*, *13 (8) 75-81*

Abstract:
Logistics operations are crucial for economic growth, with warehouses and depots playing a vital role in supply chain networks. The Saudi Arabian logistics industry is experiencing growth due to urbanization, e-commerce expansion, and government initiatives like Vision 2030. However, occupational health and safety (OHS) standards in warehouses and depots are lagging behind, leading to risks such as musculoskeletal injuries, slips, falls, and exposure to toxic substances. The lack of safety training, non-compliance with international OHS standards, and cultural barriers further compound these risks. To address these challenges, a focus on OHS practices is necessary to create safe and healthy workplaces, align with international standards, and enhance workforce capabilities. Stricter OHS legislation, state-of-the-art safety technology, and a positive safety culture are crucial for ensuring worker safety without impeding operations in the logistics sector. Additionally, challenges related to technology adoption, workforce diversity, and cultural factors necessitate comprehensive research and interventions to improve OHS practices in Saudi warehouses and depots.

Key words: Occupational health and safety, logistics management, Vision 2030, safety culture, Warehouses and Depots, and Significant hazards.

Introduction

Logistics operations are essential to creating the infrastructure for economic growth and globalization, and warehouses and depots are critical components of supply chain networks. Urbanization, e-commerce growth, and government initiatives for economic diversification as per Vision 2030 are propelling the growth of the Saudi Arabian logistics industry (Mahdaly & Adeinat, 2022). The location of the country, as a permeability between Asia, Europe and Africa has definitely boosted the role of the logistics automation. Warehouses and depots assist in storing the inventory required by the business, processing the orders and distributing the products wherever necessary to ensure the smooth operation of the process. Nonetheless, as the logistics industry is growing exponentially, the OHS of these sites are increasingly important, as they generally involve manual task, lifting, machine use, and deal with many physical hazards.

As far as the logistics sector in Saudi Arabia is concerned, despite the advancements in technology and processes, the OHS standards, especially in warehouses, and depots, have witnessed a relative fall short. Because of the physically intensive nature of logistics work, workers are exposed to musculoskeletal injuries, slip and fall incidents, and accidents involving forklifts or other machinery (Mohailan, n.d.). On top of that, to exposure to toxic substances, lack of air flow and the long working hours increasingly amounts to a threat. Layered on this is lack of extensive safety training programs, widespread noncompliance with international occupational safety and health (OHS) standards and an ingrained cultural

repugnance to workplace safety. These issues are a risk not only to employee health but also to an employer's productivity, insurance costs, and liability (Balubaid, 2023). Additional strains on system strategies must be implemented to maintain worker safety without stifling operations.

Vision 2030 is the policy framework that outlines the objectives of a vibrant society, a thriving economy, and an ambitious nation for Saudi Arabia, in which it signals the need for world-class infrastructure, safe and sustainable working environments and the development of workforce capabilities (Kosárová, 2020). High OHS in warehousing and depots contribute to these outcomes by creating safe and healthy workplaces, which are driven through a positive OHS culture. Moreover, the logistic sector should comply with international OHS standards not just to be competitive, but also to gain the trust of the international trade partners that Saudi Arabia aims to turn its logistics centre (Jaziri & Alanazi, 2019). At the global level, the study falls into the stream of marketoriented research for workplace safety in hazardous profession with the intent of achieving aspirations highlighted in the sustainability and social responsibility agenda.

This research aims to fill some critical gaps in the understanding and implementation of OHS practices in the logistics sector in Saudi Arabia. This study aims to find out the common risks that exist in warehouses and depots, assess the current safety level, and provide solutions. The proposed study aims to fill this gap through a mixed-methods approach, providing a comprehensive analysis of OHS barriers and enablers and insights for policymakers, industry leaders, and academic researchers. Saudi Arabia depicts its desire to have a safer and more efficient logistics ecosystem through this research.

To guide this investigation, several research questions have been formulated as provided below:

1. What are the prevalent occupational health and safety risks that workers in Saudi Arabia warehouses and depots are exposed to?
2. How much do existing OHS policies and practices address these risks?
3. What are the barriers to implementing international OHS standards in Saudi Arabia's logistics sector?
4. What can organizations and policymakers do to promote safety culture in logistics operations?

The research analysis also investigates the theory that stricter OHS legislation could lessen workplace injuries significantly with the use of state-of-the-art safety technology great productivity moves possible in depots and warehouses.

The research tries to be exhaustive, but this is its scope and humanity. The research is on warehouse and depot only, not in the supply chain system in Saudi Arabia, as it is part of the logistics sector system. Also, the results are the product of a small sample of firms and facilities, which may not reflect the full diversity of the logistics sector. In addition, cultural differences and organizational differences, could cause the results differ in each region in Saudi Arabia. Nonetheless, this study's findings provide access to useful data that can enhance future research and can assist next policy interventions within the occupational health and safety community.

This research addresses a core issue for the growing logistic-based market sector in Saudi Arabia. By identifying challenges and opportunities associated with OHS in warehouses and depots, this study will translate into the operations level its contribution to the development of safer and sustainable logistics, in alignment with the higher economic and social objectives of the country.

Literature Review

Overview of Occupational Health and Safety

Occupational health and safety (OHS) is a multi-disciplinary field that deals with the health, safety, and welfare of people at work. Because traditional higher-level safety systems are primarily theoretical, OHS theoretical frameworks tend to focus on the integration of safety systems into organizational structures to reduce risk and promote safety culture (Reese, 2018). One of the most cited frameworks is the Hierarchy of Controls, which groups interventions into categories: elimination, substitution, engineering controls, administrative controls, and PPE. It focuses on the elimination of hazards

first, the most effective control measure, followed by less effective controls, such as PPE being used only as a last resort (Morris & Cannady, 2019). This interconnectedness of workplace elements is also explained in the Systems Theory in OHS, which states that safety outcomes depend on how people, equipment, and processes interact with each other.

International standards are essential, for lack of a better word. It is a framework for companies to manage the process of OHS. As an example, ISO 45001 establishes international standards for the development and management of OHS management systems. It focuses on commitment to leadership, engagement of people, process approach, risk-based thinking, and continual improvement (Šolc et al., 2022). The micromanagement of hazard identification, tracking the incidents from occurring, and ensuring legal and regulatory requirement conformance are some of the advantages of the path to ISO 45001, which makes organizations opting for this standard even more vital. In the same way, regulations by the Occupational Safety and Health Administration (OSHA) establish safety standards for the workplace so that employers are responsible for preventing hazards and increasing training; International Labor Organization (ILO) conventions promoting global labor standards, such as safety regulations in dangerous industries, are other examples of such moral guidelines (Kohn et al., 2023). Together these frameworks are the pillars that OHS acts and practices are built upon that create uniformity and consistency in the way people hold back accountability within different organizations.

OHS in Logistics

Ensuring OHS in the logistics sector is a crucial part of maintaining worker wellbeing and business functioning. Logistics operations involve a number of high-risk tasks and include the storage, handling, and distribution of goods. As critical links in the supply chain, warehouses and depots suffer specific occupational hazards because of the nature of work involving heavy machinery, which is likely to be unsafe. According to Goetsch & Ozon (2019), the implementation of total OHS measures is critical in preventing any injury that might come about due to the nature of work in the Oil and gas industry since it is a constantly changing and dangerous environment that exposes workers to these many risks mentioned.

Material handling is one of the primary sources of occupational hazards in logistics. Musculoskeletal disorders (MSDs) are caused by frequent repetition of lifting, bending, carrying, etc. If you keep doing that, the unavoidably chronic back pain, joint problems, and fatigue are practically guaranteed (Korhan & Memon, 2019). Physical stressors aside, slips, trips, and falls are frequent hazards within warehouses and typically occur due to inadequate flooring, blocked walkways, or materials that are left to spill. Such accidents not only directly endanger the life and limb of workers but also disrupt operations, causing delayed processes and financial losses.

When heavy machinery like forklifts, pallet Jack, and conveyor systems, it introduces additional risk; another prevalent cause of workplace injuries in a warehouse or a depot is common problems, such as collision of the equipment and workers, overturning of the machinery, and improper machine operation. Additionally, facilities that house dangerous goods, like flammable, toxic, or corrosive material, can be detrimental to human health. If they are not handled and stored as per standard operating procedure, it can lead to respiratory problems, burns, or chemical exposure on the part of workers.

Global best practices highlight engineering controls and administrative measures, along with safety training to mitigate these risks. With the implementation of engineering controls, including ergonomic equipment, mechanized conveyor belts, and machinery that has built-in safeguards to avert possible dangers, the objective is to reduce physical stress and the likelihood of human errors (Brauer, 2022). Administrative controls consist of creating safe and clear standard operating procedures (SOPs), maintaining equipment, and strict compliance with safety policies. It provides comprehensive safety training to Contact workers for hazard awareness, how they can use the available machinery, or what precautions they can take in case of any emergency.

It is essential to consider the relevance of technology in improving OHS in logistics. Warehouses have transformed safety and efficiency due to advancements in technology, a good example being automation and movement systems that

monitor warehouse activity in real-time (Badri et al., 2018). Worn devices, for example, are able to observe the movement of physical employees and give real-time comments on how well they are doing concerning posture and physical effort to avoid injuries. Sensors of the Internet of Things (IoT) can pick up on environmental conditions, like shifts in temperature or gas leaks, and alert supervisors before these elements become critical threats (Thibaud et al., 2018). Warehouses are starting to adopt autonomous robots for monotonous work and removing humans from unsafe areas.

Challenges still exist in the logistics sector surrounding the consistent implementation of even the most sophisticated OHS measures. Many organizations have minimal resources, and even when it has, the resources are being focused on a lot of operational calls nature due to when secured safety systems or technologies are few due to funds being directed elsewhere (Ilbahar et al., 2018). In fact, smaller enterprises expressly have limited financial and technical resources to implement total safety systems. Additionally, the often transient and varied nature of the logistics workforce, frequently consisting of contracted or temporary workers, can make it challenging to guarantee that all employees receive proper training and comply with safety procedures.

Culture and behavior may render OHS actions in logistics ineffective. Fear of retaliation and concern over the ineffectiveness of reporting can cause employees to downplay injuries and report unsafe settings (Moyce & Schenker, 2018). Furthermore, in some organizations, productivity can be favored to the detriment of safety, and workers may be pressured to finish the job quickly, even if it compromises the safety protocols. These practices do not just endanger the safety of the workers, but also put organizations at highly high financial and reputational risks.

Saudi Arabian Context

Saudi Arabia features a distinct OHS environment, reflective of both the country's fast-paced economic growth as well as the Kingdom's deeper integration into worldwide supply chains. The logistics sector, which was selected within the platforms of Saudi Vision 2030, now represents the core of the economic diversification mechanism in the Kingdom. With increasing investments in infrastructure and technology, the safety of workers in warehouses and depots has come into sharper focus. The OHS framework in Saudi Arabia, however, is characterized by an amalgamation of regulatory, cultural, and organizational factors along with their interactions that pose specific challenges, making it imperative to approach occupational safety and health management comprehensively.

The Human Resources and Social Development (MHRSD) Ministry in Saudi Arabia has jurisdiction over Occupational Health and Safety (OHS) regulations along with the General Directorate of Civil Defense (Basheikh et al., 2021). Such authorities are responsible for implementing and enforcing the laws of workplace safety along the lines of international guidelines, including ISO 45001. The Saudi Building Code, which sets general requirements for the protection of hazardous materials and safety provisions beginning with, for example, fire protection plus life safety-level structural integrity and ventilation in industrial facilities such as warehouses and depots, also has a vital role to play in this context (Alardhi et al., 2022). In addition, the Kingdom has implemented labor laws that require an employer's responsibility for workers' safety, such as risk assessments, use of appropriate PPE and regular safety training. However, the enforcement of these varies widely where multinational corporations and SMEs are concerned.

Multinational businesses in Saudi Arabia are usually aligned with all major international safety standards as they are driven by compliance and corporate policies (Muselela et al., n.d.). Such organizations invest in state-of-the-art technology, rigorous training, and structured safety audits. On the other end, the logistics sector primarily consists of SMEs, which usually suffer from the lack of resources to adapt to advanced OHS. Lack of technical know-how and financial ability limits the ability of SMEs to comply with regulatory requirements. Consequently, workers in these enterprises are more exposed to occupational risks.

Cultural aspects also affect the application of OHS practices in Saudi Arabia. However, since the Kingdom's labor force is also heavily dependent on expatriates in the logistics sector mainly, this creates an issue regarding the common language and communication (Rahman, 2018). While there are few safety training materials and relevant protocols

published in English and Arabic, the vast majority of this information is not available in multiple languages, making it less accessible to workers with poor language proficiency in Arabic or English. Cultural issues with authority and risk reporting may also prevent the identification and mitigation of workplace hazards (Alsharari & Parentela, 2022). Workers may feel deterred from reporting unsafe conditions or regulation breaches because they are worried about retaliation or do not believe that effective action will be taken to rectify the situation.

The change in the demographic composition of the logistics workforce also impacts OHS in Saudi Arabia. Much of the workforce found in warehouses and depots is made up of low-skilled foreign workers, many of whom will have never worked in an environment that has had to move to strict safety guidelines before (Alqahtani et al., 2024). More often than not, their inexperience with high-tech or automated systems results in accidents, especially in contexts where safety training is poorly or irregularly provided. Tackling these challenges requires a careful means of doing so based on the unique nature of the workforce.

Saudi Arabia's logistics sector has a gradually improving trend toward technological adoption, with Vision 2030 acting as a catalyst for innovation and modernization (Baghdadi, 2024). Many warehouses have already started conducting fully automated systems, IoT-enabled monitoring devices, and data analytics to boost operation efficiency and safety. However, the adoption of these technologies is neither homogeneous nor ubiquitous. Big companies have already swallowed the majority of benefits, but small companies are still on deck. A lack of understanding of the benefits of automation, along with high initial costs for technological upgrades, are the essential hindrances preventing broader adoption.

Gaps in Existing Research

While there is an increasing focus on OHS worldwide, particularly amid the ongoing pandemic, research on such practices in Saudi warehouses and depots remains scarce and broadly incomplete. These inadequacies, however, underscore the importance of more targeted research that reflects the unique socio-economic, cultural, and regulatory context of the Kingdom. Research in logistics recently is mostly global or regional, which neglects the peculiarities of the logistic sector transformation in Saudi Arabia, which is witnessing fast and vivid changes under Vision 2030. The absence of context-specific data hampers the capability of policymakers, industry leaders, and OHS professionals to initiate actionable and customized interventions.

A vital gap is that there is inadequate empirical literature informing us about the precise occupational risks in Saudi warehouses and depots. Global studies identify similar risks, such as musculoskeletal disorders, accidents related to equipment, and exposure to hazardous substances; however, there is a lack of data on the distribution and determinants of these risks in Saudi Arabia. While other regions also suffer these challenges, things like harsh weather, cultural practices and the extreme percentage of expat workers may impact these hazards even more here. Worse yet, the consequences of prolonged exposure to high temperatures in non-climate-controlled warehouses areare currently understudied while. It is a critical issue in the desert climate of Saudi Arabia.

Another critical gap is in the assessment of available OHS policies and their implementation in the logistics sector of Saudi Arabia. Despite the Kingdom adopting international standards, such as ISO 45001, as well as establishing local regulations, research is scarce regarding the real-world implications of both the standards and regulations on the overall landscape of health and safety in the Kingdom. Research on compliance rates, difficulties in enforcement, and the importance of inspections in workplace safety are lacking. Additionally, little attention has been paid to OHS risk management of small businesses, which may be particularly challenged as they tend to lack the resources and expertise available to larger firms and may not be sufficiently taken into account by regulatory regimes.

There is scarce literature on OHS and technology in Saudi warehouses and depots. Despite the growing recognition to leverage technological solutions, such as automation, wearable devices, and IoT sensors to help mitigate workplace hazards, their use in the Saudi context remains poorly documented. This is an area where research is needed because people need to understand if the sector is ready to utilize these innovations and determine the barriers to implementation,

including cost, workforce training, and technical knowhow. Research to assess the relevance of these technologies for the mitigation of identified risks and, in at least a minimum compliance context, could serve as a helpful industry guide. Cultural and workforce dynamics constitute an additional under-researched domain. The logistics workforce in Saudi Arabia is made up of local and expatriate workers from diverse countries. Nevertheless, this mix brings challenges, from poorly synchronized communication through lack of training to non-compliance to safety protocols. However, the extent to which cultural attitudes towards safety, authority, and reporting impact OHS in this context is not well understood. Studies that utilize and incorporate cultural aspects to explore the relationship between safety practices and safety-related factors may provide the knowledge needed to inform targeted and culturally appropriate training programs and interventions.

Lastly, a significant research gap exists in OHS studies within the logistics sector that connects OHS to broader economic and social outcomes. Improving workplace safety is a good thing in itself. However, none of the articles establish a link between improved safety and higher productivity, lower operating costs, or other economic objectives, as presented in Vision 2030. Knowing how to demonstrate the size of these benefits could reinforce the business case for investing in OHS and spur a more concerted commitment from all affected interests.

References

1. Alardhi, A., S Alaboodi, A., & Almasri, R. (2022). Impact of the new Saudi energy conservation code on Saudi Arabia residential buildings. *Australian Journal of Mechanical Engineering*, *20*(5), 1392-1406.
2. Alqahtani, F. M., Alqahtani, N. S., Algarni, F. S., Almuhaidib, I. A., Alessa, F., & Noman, M. A. (2024). Development of an educational program for occupational health and safety in Saudi Arabia. *Journal of Engineering Research*.
3. Alsharari, A. S. D., & Parentela, G. M. (2022). Healthcare Employees' Occupational Health and Safety Conditions in Saudi Arabia; A Mini Literature Review. *Austin J Public Health Epidemiol*, *9*(4), 1133.
4. Badri, A., Boudreau-Trudel, B., & Souissi, A. S. (2018). Occupational health and safety in the industry 4.0 era: A cause for major concern?. *Safety science*, *109*, 403-411.
5. Baghdadi, A. (2024). An Evaluation Study of the Impact of Occupational Health and Safety on Productivity in Saudi Arabia Construction Industry. *American Journal of Civil Engineering and Architecture*, *12*(2), 36-43.
6. Balubaid, T. S. (2023). *ASSESSING THE OCCUPATIONSL SAFETY AND HEALTH MANAGEMENT SYSTEM AND ACCIDENT ANALYSIS–A CASE STUDY OF THE SAUDI CARGO SECTOR* (Doctoral dissertation, KING ABDULAZIZ UNIVERSITY).
7. Basheikh, M. A., Balubaid, H., Mohammed, B. A., & Hashim, B. (2021). Kingdom of Saudi Arabia. *Int. J. Ageing Dev. Ctries*, *6*, 141-154.
8. Brauer, R. L. (2022). *Safety and health for engineers*. John Wiley & Sons.
9. Goetsch, D. L., & Ozon, G. (2019). *Occupational safety and health for technologists, engineers, and managers* (p. 720). New York: Pearson.
10. Ilbahar, E., Karaşan, A., Cebi, S., & Kahraman, C. (2018). A novel approach to risk assessment for occupational health and safety using Pythagorean fuzzy AHP & fuzzy inference system. *Safety science*, *103*, 124-136.
11. Jaziri, R., & Alanazi, A. S. (2019). The Vision of Physical Internet in Saudi Arabia: Towards a Logistic Hub in 2030. *International journal of Trade & Commerce-IIARTC*, *8*(2), 249-262.
12. Kohn, J. P., Friend, M. A., Friend, M., & Kohn, J. (2023). *Fundamentals of occupational safety and health*. Rowman & Littlefield.

13. Korhan, O., & Memon, A. A. (2019). Introductory chapter: work-related musculoskeletal disorders. In *Work-related musculoskeletal disorders*. IntechOpen.
14. Kosárová, D. (2020, February). Saudi Arabia's vision 2030. In *Security forum* (pp. 124-134).
15. Mahdaly, K., & Adeinat, I. (2022). Factors that affect the adoption of RFID in the Saudi logistics industry: an empirical investigation. *The International Journal of Logistics Management*, *33*(3), 1017-1039.
16. Mohailan, M. H. S. The Reality of Logistics Performance in the Kingdom of Saudi Arabia and Opportunities to Improve It.
17. Morris, G. A., & Cannady, R. (2019). Proper use of the hierarchy of controls. *Professional Safety*, *64*(08), 37-40.
18. Moyce, S. C., & Schenker, M. (2018). Migrant workers and their occupational health and safety. *Annual review of public health*, *39*(1), 351-365.
19. Muselela, C., Mweemba, L., & Mubita, K. Exploration of safety culture and performance in the selected multinational organisation in Saudi Arabia: an occupational accidents perspective.
20. Rahman, M. M. (2018). Beyond labour migration: The making of migrant enterprises in Saudi Arabia. *International Sociology*, *33*(1), 86-106.
21. Reese, C. D. (2018). *Occupational health and safety management: a practical approach*. CRC press.
22. Šolc, M., Blaško, P., Girmanová, L., & Kliment, J. (2022). The development trend of the occupational health and safety in the context of ISO 45001: 2018. *Standards*, *2*(3), 294-305.
23. Thibaud, M., Chi, H., Zhou, W., & Piramuthu, S. (2018). Internet of Things (IoT) in high-risk Environment, Health and Safety (EHS) industries: A comprehensive review. *Decision Support Systems*, *108*, 79-95.