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# Impact of ISO 45001 Implementation on Occupational Health and Safety Management: A Case Study of NCA Rouiba.

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**Abstract :**

This research explored the impact of ISO 45001:2018 implementation on occupational health and safety (OHS) management at NCA Rouiba, a company specializing in the production of non-alcoholic beverages. Questionnaires were distributed to 100 employees out of 434, representing all levels of the organization across three professional categories : managers, supervisors, and operational staff. The results showed that the adoption of ISO 45001 significantly improved OHS performance indicators, including the reduction of workplace accidents. The standard reinforced existing prevention measures and introduced new ones, improving overall risk prevention practices. Employees' perception of safety in the workplace improved after the implementation of ISO 45001, as confirmed by the responses to the questionnaire. The structured approach of ISO 45001 has enabled NCA Rouiba to strengthen its preventive measures, increase employee involvement and create a safer working environment. While progress in OHS management is evident, the study underlines the importance of continuous improvement efforts to maintain and build on these achievements, aiming for excellence in workplace safety at NCA Rouiba

***Key words :*** *Impact, ISO 45001, Implementation, Heath and Safety Management.*

**Introduction :**

Occupational accidents and work-related diseases result in about 6,300 fatalities per day, constituting a significant burden on organizations and society as a whole. This concerning number highlights the pressing necessity for improved occupational health and safety (OHS) management strategies to mitigate accidents and morbidity (Zimolong & Elke, 2006; Liu et al., 2020). An essential measure in this regard is adopting ISO 45001, which organizations may follow to enhance health and safety standards. Modern occupational health and safety management systems methodologies emphasize the importance of personal knowledge about workplace and daily hazards. Employers are responsible for identifying risks associated with work processes, implementing procedures to eliminate or minimize such risks, and educating employees about any remaining hazards (Pouliakas & Theodossiou, 2013; Díaz-Cabrera et al., 2010). The implementation of ISO 45001 is expected to bring about significant improvements in workplace safety, leading to a reduction in occupational accidents and illnesses. This standard establishes a systematic framework for occupational health and safety management, promoting a proactive risk identification and reduction methodology (Nag et al., 2020; Marhavilas et al., 2022). ISO 45001 seeks to improve overall workplace safety performance by promoting a culture of safety awareness and ongoing enhancement. Its execution necessitates dedication from all organizational tiers, from senior management to individual employees, to foster a safer and healthier workplace (Morgado et al., 2019; Dilokwattanakul et al., 2023). The development of occupational health and safety (OHS) has traditionally focused on reducing accidents related to the use of technology in work processes, and it has evolved over specific eras (Badri et al., 2018; Botti et al., 2022). There is a significant increase in the use of risk management theory across different levels and activities, even considering low-probability catastrophic events due to their potentially severe societal consequences. This risk-based approach now includes other areas such as land use planning, construction of new facilities, transportation of hazardous materials, and other operations with significant potential social impact (Nocco & Stulz, 2006 ; Krause & Tse, 2016). This shift indicates a growing recognition of the need to anticipate and mitigate even unlikely events with far-reaching consequences, integrating risk management principles into various occupational and public safety aspects (Paape & Speklé, 2012 ;Settembre-Blundo et al., 2021). This progression reflects an increased emphasis on proactive risk assessment and management to enhance workplace and public safety across various industries. Protecting individuals in the workplace is rooted in the Declaration of Fundamental Rights and Freedoms and goes beyond just preserving life and health (Li et al., 2015 ; Hauke et al., 2020). It involves safeguarding workers and others from the adverse effects of labour and the work environment, considering all relevant factors associated with employment. This includes establishing favourable working conditions, promoting employee well-being, ensuring social and legal protections for individuals, and conserving material assets, labour, and the environment (Noroozi & Taherian, 2023 ; Briamonte et al., 2024). Regarding employee protection, it is essential to consider factors such as stress, pressure, job monotony, working environment, interpersonal interactions, workplace facilities, and fair compensation. The European Union's health and safety policy is underpinned by a comprehensive approach, as seen in the 'Community strategy '. This strategy

advocates for the integration of all aspects of labour, from physical conditions to social and legal protections (Randall, 2001). It's this holistic view that has led to the wider implementation of integrated management systems. In this regard, the ISO 45001:2018 standard serves as a significant resource. It offers a comprehensive methodological framework for implementing an efficient occupational health and safety (OHS) management system (Marhavilas et al., 2022; (Dilokwattanakul et al., 2023). By adhering to its stipulations, organisations can avert accidents and occupational illnesses, enhance overall efficiency, and guarantee a healthy and safe workplace (Lourenço et al., 2019 ; Musungwa & Kowe, 2022). This research study investigates the effects of the ISO 45001:2018 standard on occupational health and safety management. The standard provides guidelines for identifying hazards, assessing risks, and implementing control measures. There is limited research on the impact of ISO 45001 in the Algerian context, specifically in the food sector. This study aims to fill this gap by examining the influence of the ISO 45001 standard on enhancing health and safety at work in the NCA-Rouiba food company, which specializes in non-alcoholic beverage production. The research question addressed is: What are the contributions of the ISO 45001:2018 standard to occupational health and safety management within the NCA Rouiba company?

**Methodology**

The agri-food company NCA Rouiba boasts an excellent organizational structure and offers a wide range of products certified to ISO standards. It demonstrates a strong commitment to quality, food safety, environmental protection, and worker health and safety through rigorous production and control processes. This commitment is further evidenced by the acquisition of several internationally recognized certifications, notably ISO 9001:2015 for quality management, ISO 14001:2015 for environmental management, ISO 26000 for social responsibility (implemented in 2011), and ISO 22000 for food safety management (achieved in January 2013 after two years of dedicated effort). The ISO 22000 certification in particular reinforces NCA Rouiba's commitment to its clients and consumers by providing an additional quality guarantee for its diverse product range. Collectively, these certifications reflect NCA Rouiba's dedication to continuous improvement and adherence to international standards across various operational aspects.

The data collection for this study was carried out in two phases. The first phase involved developing questionnaires, while the second phase included on-site observations at NCA Rouiba and evaluation of company data. To verify our initial hypotheses, we used stratified random sampling to create two questionnaires targeting three professional categories: Managers, Supervisors, and Operational staff. These questionnaires were distributed to a sample of 100 employees out of a total workforce of 434, ensuring representation across all levels of the organization. The first questionnaire, aimed at managers, was designed to measure their level of involvement in occupational health and safety (OHS) and their perception of safety since the implementation of ISO 45001 at NCA Rouiba. The second questionnaire was intended for supervisors and operational staff. Both questionnaires aimed to assess safety improvements since the implementation of ISO 45001 at NCA Rouiba, considering that NCA was committed to OHS even before ISO 45001 requirements were established. This assessment was done through various variables such as safety instructions, OHS communication methods, and the use of personal protective equipment. This approach has allowed us to gather comprehensive data on the impact of implementing ISO 45001 from various perspectives within the company.

Table 1. Répartition de la Population Socioprofessionnelle Enquêtée au sein de l'Entreprise NCA Rouiba.

| Socio-professional Category | Population | Sample | Percentage relative to total population (%) | Percentage of sample relative to total sample (%) |
|---|---|---|---|---|
| Managers | 130 | 20 | 30 | 4.6 |
| Supervisors | 168 | 44 | 38.7 | 10.13 |
| Operational staff | 136 | 36 | 31.33 | 8.4 |
| Total | 434 | 100 | 100 | 23.13 |

The initial questionnaire, directed at managers, assessed their commitment to occupational health and safety (OHS) and their perception of safety following the adoption of ISO 45001 at NCA Rouiba. This specific questionnaire was essential for gathering targeted information relevant to the "Managers" group, including their involvement in safety behaviour visits and identifying and assessing risks. The second questionnaire was designed for supervisors and operational staff. Both questionnaires aimed to evaluate the improvements in safety following the adoption of ISO 45001 at NCA Rouiba, recognizing that the company had already been committed to health and safety at work before implementing the ISO 45001 standards. This evaluation was conducted using various criteria, including safety protocols, health and safety communication strategies, and the use of personal protective equipment.

## Result and discussion

***Descriptive information about the food company NCA Rouiba***

Table 2 summarizes the results for the main characteristics of the NCA Rouiba agri-food company and the managers of its various agri-food businesses.

Table 2. Profile of Managers and Staff in the NCA Rouiba Food Industry.

| Variable | Category | Frequency | Percentage |
|---|---|---|---|
| Age | 20-29 years | 5 | 5% |
| | 30-39 years | 16 | 16% |
| | 40-49 years | 44 | 44% |
| | Over 50 years | 35 | 35% |
| Seniority | Less than 1 year | 4 | 4% |
| | 1-5 years | 7 | 7% |
| | 6-9 years | 10 | 10% |
| | 10-19 years | 48 | 48% |
| | Over 20 years | 31 | 31% |
| Socio-professional Categories | Manager | 20 | 20% |
| | Supervisor | 44 | 44% |
| | Operational staff | 36 | 36% |

The sample data shows a wide range of ages, with the majority (79%) of participants being 40 years old and over. This result suggests that the participants have significant professional experience and maturity, which could enhance the application of ISO 45001. Regarding tenure, 89% of the sample had over 5 years of experience, while 79% had more than 10 years with the organization, indicating employee stability and a comprehensive understanding of safety protocols and hazards. This long-term view provides unique insights into the evolution of workplace safety culture before and after adopting ISO 45001. The socio-professional categories are 44% supervisory personnel, 36% operational personnel, and 20% managerial workers, providing diverse jobs and responsibilities within the organization. This diverse composition offers multiple perspectives on the impact of ISO 45001 on workplace safety culture.

***Managerial participation in ISO 45001***

In the following section, we will highlight the active and visible participation of managers at all levels within the Occupational Health and Safety Management System (OHSMS) under ISO 45001.

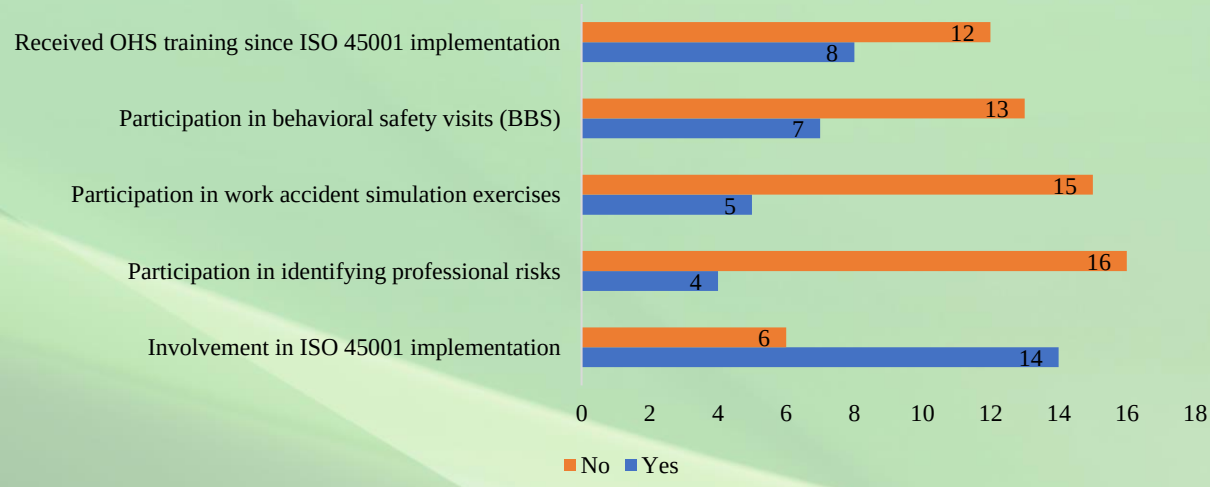



**Figure 1.** Managers' Perceptions and Involvement in ISO 45001 Implementation

Figure 1 shows essential findings regarding management involvement in occupational health and safety (OHS) practices after implementing ISO 45001. The figure displays the responses from participants on their involvement in various Occupational Health and Safety (OHS) activities after adopting ISO 45001. It shows the number of participants who have received OHS training since the implementation, with 12 affirming and 8 denying involvement. Similarly, 13 participants confirmed their participation in behavioural safety visits, while 7 did not. The chart also indicates a higher engagement in work accident simulation exercises and identifying professional

risks, with 15 and 16 participants respectively affirming their participation, compared to 5 and 4 who did not. Lastly, 14 participants were involved in implementing ISO 45001, against six who were not. Coloured bars—blue for "Yes" and orange for "No"—visually differentiate the responses, highlighting a solid engagement, particularly in identifying professional risks and ISO 45001 implementation.

Although there was initial solid engagement in implementing the standard, participation in specific OHS activities decreased, indicating potential discrepancies between policy and practice. This aligns with recent studies on the challenges of implementing ISO 45001 (Ghahramani, 2016; Domínguez et al., 2023). The significant involvement during the initial implementation demonstrates a strong commitment from management, which is critical for effectively implementing an OHS management system. However, reduced participation in specific activities indicates ongoing issues with leadership involvement. Only four managers identified professional hazards despite ISO 45001's emphasis on proactive hazard identification and risk assessment (Darabont et al., 2017). The limited participation in behavioural safety visits and work accident simulations suggests the potential for improvement in fostering a strong safety culture (Da Silva & Amaral, 2019). Following the implementation, only eight managers underwent OHS training, potentially leading to deficiencies in continuous learning and improvement, which are fundamental aspects of ISO 45001 (Madsen et al., 2020). The gap between initial implementation engagement and sustained participation may indicate challenges in fully integrating OHS management into daily operations, which Ramos et al., (2020) deemed essential for realizing the full benefits of ISO 45001 (Ramos et al., 2020). The findings highlight the need for increased managerial involvement in effective safety protocols and ongoing occupational health and safety education to leverage the benefits of ISO 45001 fully.

***Occupational health and safety training***

In the upcoming section, we will showcase how managers actively and visibly participate in training staff for the Occupational Health and Safety Management System (OHSMS) in accordance with ISO 45001 (Figure 2). From figure2, eight out of twenty managers have undergone OHS training since adopting ISO 45001, accounting for 40% of all participants. This finding suggests that a significant number of managers have taken part. In general, participation in training represents the highest percentage of managerial involvement. Nonetheless, recognizing occupational hazards remains the domain with minimal management engagement and needs specific focus.


**Figure 2.** Occupational Health and Safety Training Participation by NCA Rouiba Managers.

The data on manager training frequencies provides insights into the implementation of ISO 45001 and OHS practices at the organization. The high frequency of chemical handling certification training suggests a strong emphasis on chemical safety, aligning with research indicating chemical hazards remain a significant concern in many industries (Morrow et al., 2021). The focus on workplace safety training reflects ISO 45001's core principles of creating a prevention culture (Muñoz-Pascual et al., 2020), while attention to emergency response through first aid and firefighting training demonstrates commitment to emergency preparedness (Haas & Yorio, 2016). The presence of risk identification and assessment training aligns with ISO 45001's risk-based approach (Darabont et al., 2017), and the inclusion of behavioral safety visits training suggests an attempt to incorporate principles shown to improve safety outcomes (Guo et al., 2020). The diverse range of training topics indicates a comprehensive approach to OHS as recommended by ISO 45001 (ISO, 2018). However, lower frequencies in areas such as work

permits and workplace risks might indicate potential areas for increased focus (Fernández-Muñiz et al., 2018). Overall, this training profile suggests a proactive approach to OHS management, aligning with ISO 45001's emphasis on leadership engagement and continuous improvement, while also indicating potential areas for more balanced training distribution.

***Managers' perspectives on enhancing workplace safety***

This section examines managers' perspectives on enhancing workplace safety after the introduction of the Occupational Health and Safety Management System.

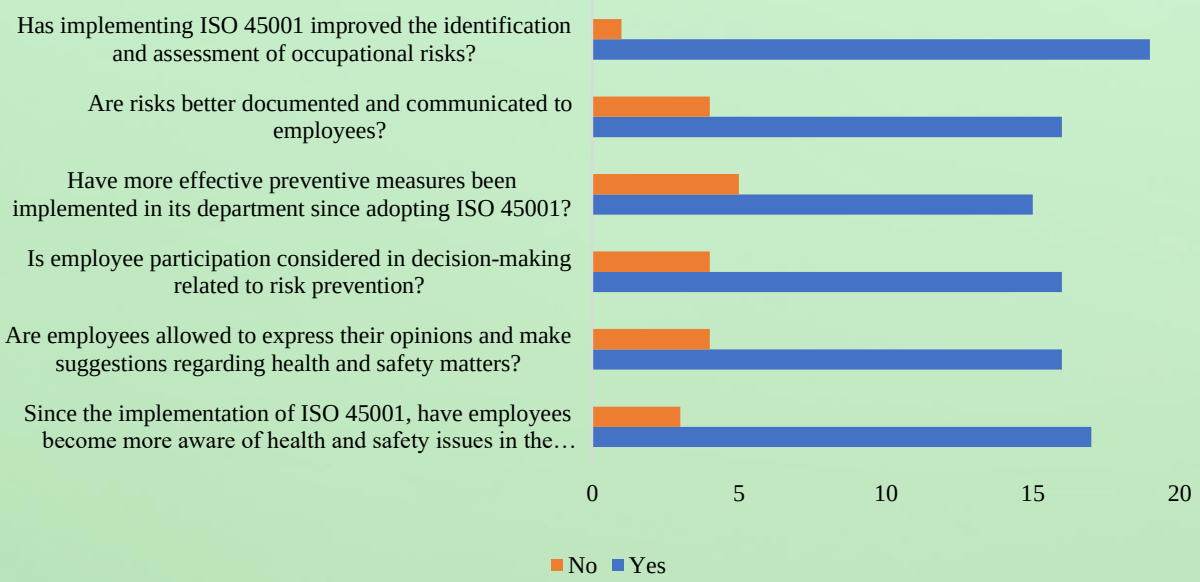



**Figure 3**. Managers' perceptions of enhancements in workplace safety.

The findings from figure 3 indicate a significant beneficial effect of ISO 45001 on several facets of occupational health and safety. Ninety-five per cent of managers (19 out of 20) recognised enhancements in the Identification of Hazards and Risk Assessment (IDER) procedures, demonstrating the standard's ability to optimise and formalise these essential operations, hence increasing their efficacy. This indicates that ISO 45001 has implemented systematic methods for recognising and alleviating hazards, which are crucial for ensuring a safe workplace (Coze, 2005 ; McNamara, J. H. (2014). Moreover, 80% of managers indicated risk reporting and communication advancements, highlighting increased openness. This finding indicates that the standard has cultivated a culture of transparent communication concerning risks, ensuring that staff are adequately informed about potential dangers and requisite safety protocols (Kohl, 2020 ; (Bautista-Bernal et al., 2024). The adoption of ISO 45001 has led to significant improvements in preventive measures, with 75% of respondents noting the use of more effective methods. This highlights the standard's practical effect in fostering proactive risk management strategies instead of reactive event reactions (Asbury, 2021 ; Claxton et al., 2022). Regarding employee involvement, the finding that 80% of managers acknowledge workers' participation in decision-making linked to risk avoidance signifies a transition towards more inclusive methods. ISO 45001 advocates for a participatory approach, enabling employees to engage in health and safety measures and cultivating ownership and accountability. The 85% rise in employee understanding of OHS problems underscores the efficacy of ISO 45001 in facilitating consistent awareness programs. This fosters a safety-oriented staff since regular communication and training may cultivate a safety culture inside the organisation. The findings indicate that ISO 45001 has significantly and positively influenced organisational procedures and safety culture (Majumdar, 2019 ; Kabiesz & Tutak, 2024).

***Employees' Perception of Workplace Safety Improvements***

The subsequent section examines employees' perspectives on improvements in workplace safety following the implementation of the Occupational Health and Safety Management System.

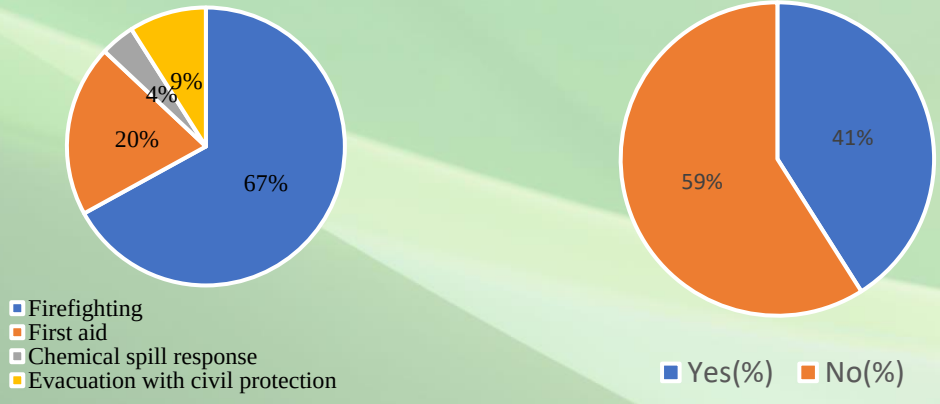
According to the findings, a significant majority, 89% of respondents, believe that the ISO 45001 standard has positively impacted health and safety within the company, while 11% do not perceive a positive effect from the implementation of this standard. An overwhelming majority of 75 respondents feel that safety is a paramount priority within the company, corroborated by an impressive 93.75% who affirm that safety is paramount at NCA Rouiba. The general sense of safety at work has reportedly improved for 85% of respondents since adopting ISO 45001, suggesting that the company's safety efforts are having a tangible impact on employee well-being.

Moreover, 83.75% of respondents feel better informed about the specific occupational risks associated with their roles and the preventive measures in place. A similar proportion, 85%, attest that the company considers employees' opinions in safety-related decision-making. Additionally, 86.25% of respondents observe more frequent awareness campaigns about good safety practices since the standard's implementation. Finally, the same majority perceives a strengthened commitment from management towards safety, indicating a shift towards a proactive and prioritized approach to safety by the leadership. This holistic improvement in safety culture and practices likely stems from the structured and systematic approach enforced by ISO 45001, which emphasizes continual improvement, risk prevention, and employee involvement, fostering a safer and more informed workplace environment. ISO 45001 offers a systematic framework for hazard identification, risk assessment, and control implementation in risk management. This methodical approach enhances overall safety performance and employee perceptions of safety. Morgado et al. (2019) observed that adopting ISO 45001 frequently enhances hazard identification and risk assessment procedures, hence fostering a greater sense of safety among employees in the workplace. Augmented safety culture: The standard underscores the importance of leadership commitment and employee involvement, essential in cultivating a robust safety culture. Bautista-Bernal et al. (2024) discovered that organisations adopting Occupational Health and Safety Management Systems (OHSMS) such as ISO 45001 frequently observe enhancements in safety culture, resulting in heightened employee knowledge and favourable perceptions of safety initiatives.


**Figure 4.** Employees' responses concerning the impact of the ISO 45001 standard on OHS within the company.

***Preventive Measures for OHS in NCA Rouiba***

In the following section, we will outline the preventive measures that have been put in place to manage occupational risks as part of the occupational health and safety management system at the NCA Rouiba food company




(a) (b)

Figure 5. a) Types of Safety Simulation Exercises at NCA Rouiba and b) Total number of employees who have taken OHS training courses

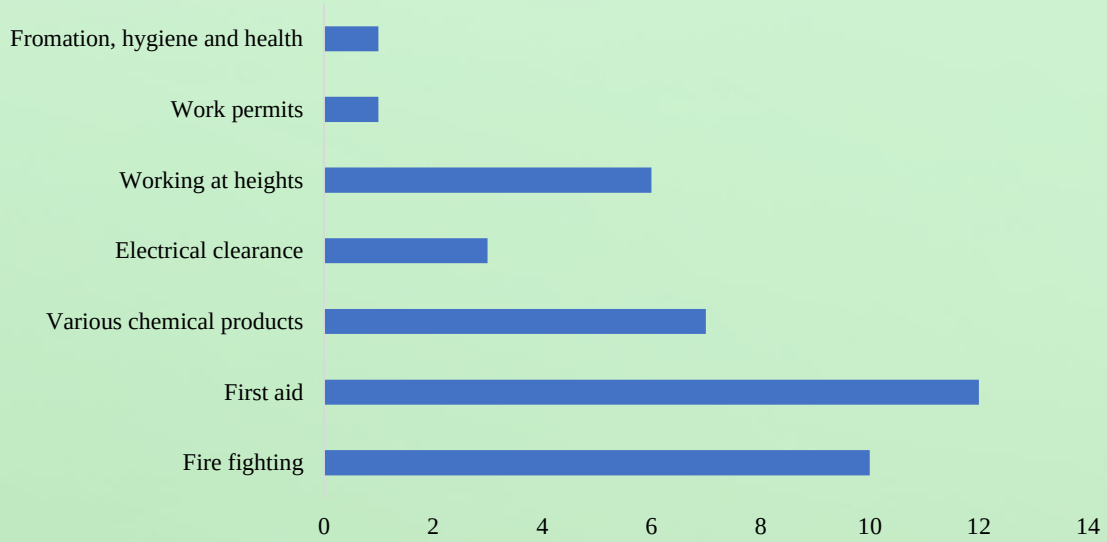



**Figure 7.** Employee training on the Occupational Health and Safety (OHS) system.

The data about training frequency for several occupational health and safety (OHS) issues at NCA Rouiba presents some significant findings (Figure 5a and 5b). The frequent occurrence of fire fighting (10) and first aid (12) training signifies a robust focus on disaster preparedness, along with the findings of Haas & Yorio (2016) about effective occupational health and safety management systems. The emphasis on training regarding chemical goods (7) indicates an acknowledgement of chemical hazards as a substantial occupational concern, along with the results of Morrow et al. (2021). Focusing on high-risk tasks such as working at heights (6) and electrical clearance (3) demonstrates an understanding of possible hazards, as corroborated by Li et al.'s (2015) study on task-specific safety training. The seldom issuance of work licenses (1) and training in hygiene and health (1) suggest a necessity for enhanced focus on systemic Occupational Health and Safety management strategies, as emphasised by Morgado et al. (2019). The distribution of topics indicates a thorough approach to OHS training aligned with ISO 45001 standards; however, there are opportunities to enhance systemic elements of OHS management by augmenting training in work permits and comprehensive health and hygiene management. The data showing that only 41% of employees have taken OHS training courses, while 59% have not suggests a potential gap in the implementation of safety training programs at NCA Rouiba (see Figure 6). This finding warrants further analysis and can be interpreted in several ways, including training prioritization, resource constraints, the recent implementation of ISO 45001, the effectiveness of communication, and employee engagement issues. Research has shown comprehensive safety training is crucial for improving safety outcomes and reducing workplace accidents (Robson et al., 2012).

## Conclusion

In the context of our research, we have explored fundamental concepts related to Occupational Health and Safety, the ISO 45001:2018 standard, and risk prevention in the workplace. For the practical case study, we conducted an investigation within NCA Rouiba to assess the impact of the ISO 45001:2018 standard on Occupational Health and Safety management and to propose improvement actions. Implementing ISO 45001:2018 at NCA Rouiba enhances workplace safety by reducing accidents, reinforcing safety measures, and ensuring compliance with Algerian regulations. Firstly, our analysis demonstrated that the adoption of the ISO 45001 standard led to a significant improvement in Occupational Health and Safety (OHS) performance indicators. This was reflected in a notable reduction in the number, severity, and frequency of workplace accidents. These results highlight the effectiveness of the preventive measures implemented by the company. Furthermore, the findings revealed that not only were existing preventive measures reinforced, but new measures were also adopted following the implementation of the ISO 45001 standard. This underscores the positive impact of the standard on the continuous improvement of professional risk prevention practices within the company. Moreover, our investigation showed a positive perception among employees regarding the enhancement of workplace safety since the implementation of the ISO 45001 standard. The results of the administered questionnaires confirmed that the actions taken have contributed to strengthening employees' trust in their work environment concerning safety. The adoption of ISO 45001 has undeniably contributed to improving OHS management at NCA Rouiba. The structured, rigorous approach imposed by the standard has enabled the company to reinforce its preventive measures, involve its employees more effectively and create a safer, healthier working environment for all. The progress made by NCA

Rouiba in terms of OHS is very promising, and it is essential to pursue continuous improvement efforts to maintain and reinforce these achievements and aim for excellence in workplace safety.

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