

Article

Occupational Health and Safety Management System of a South African University Setting

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Abstract: The quality of education is significantly influenced by occupational health and safety (OHS) measures. To this end, a safety incident at a university could have far-reaching negative effects on facilitating teaching and learning for both lecturers and students. Although OHS standards are widely established in numerous industries, they are often overlooked in the academic setting. It is for this reason that, to date, research gap exists in OHS systems in academic settings. While universities primarily focus on education, they also pose significant health and safety risks to staff and students due to their design and setup. Effective implementation of an occupational health and safety management system (OHSMS) within universities can mitigate these risks. However, there is a notable lack of research focusing on the efficiency of OHSMS in South African universities. This study, therefore, aimed to fill this gap by assessing the efficiency of the OHSMS at a South African university. Data were collected using in-depth interviews, observations, and document analysis qualitative research methods. Data analysis was carried out using the thematic analysis approach. Inductive logic was used in the interpretation of the current study results. This study highlights that while there is strong awareness of the OHS Act 85 of 1993 (>90%) among university staff, significant gaps exist in the communication and enforcement (5%) of OHS policy, alongside the poor communication of hazards and risks (30%). Amongst other challenges are infrastructure maintenance (>35%), as well as the lack of standard operation procedures (>5%). To address some of these setbacks, the current study recommends enhancing policy communication, conducting regular hazard assessments, increasing training participation, and improving documentation practices. These steps aim to improve the efficiency and effectiveness of the university's OHSMS, ensuring a safer environment for all stakeholders.



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Keywords: occupational health and safety; occupational health and safety management system; university; occupational health and safety ACT

1. Introduction

Recently, the impact of the increasing number of accidents associated with industrial activities has been increasingly felt in different countries, and it has attracted attention from safety practitioners, environmentalists, and researchers. This entails that accidents are increasing due to the expansion of industries and the technology used in industries to increase the speed of production [1]. In developing countries, however, some risks often go unreported due to inadequate risk reporting systems [2]. To address these challenges, numerous organizations have implemented occupational health and safety (OHS)

programs aimed at reducing or eliminating workplace accidents [3]. These programs are part of a broader, more systematic approach known as the occupational health and safety management system (OHSMS), which integrates all aspects of occupational health and safety into a comprehensive management framework [3]. The OHSMS follows a structured process that includes planning, implementation, measurement, and monitoring to ensure ongoing workplace safety and health [3]. Complementing this perspective, Ledic Neto [4] highlights that OHSMSs are not only integral to managing and controlling risks that could impact workers' well-being; they also play a crucial role in helping organizations comply with relevant legislation. Together, these insights underscore the dual function of OHSMSs, which is fostering a safe working environment and ensuring regulatory compliance. Furthermore, Mohammedi [5] emphasizes the critical importance of implementing an OHSMS in workplaces to safeguard employee well-being, reduce accidents, and create a safer work environment that also has positive environmental impacts. This approach is noted to enhance productivity and promote sustainable development, aligning with Johaness' [6] observation of the growing global awareness around occupational safety and health management systems (OSHMSs). However, Johaness [6] also points out a significant skepticism and reluctance, particularly in the least developed and developing countries, toward adopting OSHMSs, highlighting a gap between awareness and implementation that warrants further exploration and understanding.

Nugroho [7] defines a system as a cohesive assembly of components or sub-systems that are systematically arranged, interconnected, and unified towards achieving a common objective. In this context, an occupational health and safety management system is a structured approach used for overseeing and regulating safety measures, specifically designed to ensure safety through the interconnected elements of planning, implementation, measurement, and monitoring, typically following the plan–do–check–act cycle, also known as the Deming Wheel [7]. Furthermore, Subhani [8] highlights the significant importance of the occupational health and safety (OHS) concept in the industrial sector compared to universities. As a result, industries are more inclined to implement standardized occupational health and safety management systems than universities. These OHSMSs provide a structured approach to managing health and safety, with a focus on continual improvement [8]. It is widely believed that effective OHSMSs not only reduce the costs and impacts of accidents and health issues but also enhances employee productivity and efficiency [8]. Hossain [9] points out that both production and service industries recognize the importance of OHS practices for the quality assurance of products and services. Unlike many other industries, where the production process and service receivers remain isolated, the production and consumption of university services are directly connected; thus, the quality of education is significantly affected by OHS measures [9]. An incident resulting from a lack of safety practices in a university could have adverse effects on the nation's present and future [9]. However, although safety practices have been examined in various industries, OHS research in academic institutes is comparatively limited. Managing and handling accidents on campuses within the education sector requires great attention [10]. A university, as an organization directly involved with people (students, employees, lecturers, etc.), must provide educational services in a healthy, safe, and happy environment, which is of the utmost importance [10]. According to Syed-Mohamad [11], the safety of staff, students, and university assets must be a priority. Workshops and laboratories, for example, have the potential to contribute to accidents [11]. Scholars adds that laboratory researchers and students may be exposed to hazardous and toxic chemicals, making the implementation of the occupational health, safety, and environment management systems a critical aspect of higher education [12,13]. Even though universities are meant to deliver education, which is considered fundamental for learning, they still need to be recognized

as industries which pose health and safety risks to staff and students, mainly due to their design and set-up [14]. According to Subhani [8], universities can pose a variety of health and safety risks to staff and students, ranging from hazards in the physical environment (e.g., slippery floors, poorly lit stairwells) to exposure to hazardous materials (e.g., chemicals in laboratories) and to mental health and well-being issues (e.g., stress, burnout). To mitigate these risks, universities must have occupational health and safety management in place and ensure that all staff and students are aware of and adhere to them [8]. They must also conduct regular risk assessments and audits to identify and address any potential hazards [8]. Studies have demonstrated that in instances where the occupational health and safety management system (OHSMS) is present and effectively implemented, some of the fundamental hazardous causes can be mitigated [14]. However, Rodriguez [1] bemoans the lack of OHS South African-specific research that solely focuses on the context of the health and safety of campuses within the universities in the country. While universities primarily focus on delivering education, Subhani [8] warns that health and safety risks could undermine their core mission and objectives. Be that as it may, in developing countries, the overall state of OHS at universities is concerning, and research in this area is scarce [9]. Given the critical importance of ensuring a safe educational environment, this study seeks to assess the efficiency of the occupational health and safety management system (OHSMS) at a South African university. Understanding how well these systems are implemented and identifying areas for improvement will contribute to enhancing the safety and well-being of students, staff, and other stakeholders within the academic community. While the OHS is well-established in industry, its implementation in universities, especially in developing countries, remains inconsistent despite growing risks [8]. This study found that fewer than 60% of South African public universities have fully implemented safety committees, training programs, or hazard assessments. Common incidents include fires, chemical exposure, infrastructure hazards, and mental health concerns [1]. Effective OHSMS implementation can reduce such risks and improve institutional resilience [3]. Strengthening OHSMS is therefore essential for legal compliance and safeguarding the health and productivity of university communities.

2. Materials and Methods

2.1. Study Area

The South African higher education system comprises twenty-six (26) public universities differentiated into eleven traditional universities, nine comprehensive universities, and six universities of technologies [15,16]. Both public and private sectors are governed in terms of the Higher Education Act 101 of 1997, as amended under the Department of Higher Learning and Training (DHET). To assess the efficiency of the OHSMS at a South African university, this study was conducted at one of South Africa's six (6) universities of technology. Details on how this study was conducted are outlined in the research methodology.

2.2. Research Design

A research design comprises the methodologies and procedures employed in research studies to collect, analyze, interpret, and report data (Boru [17], citing Creswell and Plano Clark [18]). It functions as a comprehensive plan that connects conceptual research problems with feasible empirical research [17]. In the context of this study, the research design formed a solid foundation for assessing the efficiency of the OHSMS at the university in South Africa. It guided the processes of data collection, analysis, and interpretation, ultimately enabling the effective fulfilment of the research objectives. By employing a qualitative research design, a comprehensive understanding of how participants perceive and experience the effectiveness of the OHSMS at a university was achieved, enabling

a deeper exploration of their perspectives, experiences, and the processes involved in ensuring OHSMS efficiency.

2.3. Sampling Frame

The sampling frame refers to the list of individuals from which the sample was drawn. For this study, a sampling frame was constructed specifically for the in-depth interviews. It included active members of health and safety committees, verified through attendance registers and consultation with committee chairs. Individuals who only attended meetings on request were excluded. The final sampling frame comprised eligible, consistently involved committee members across all relevant structures.

2.4. Sample Size

Creswell [19] suggested using formulas to calculate and determine the sample size, viewing this as a form of accountability and justification for selecting a specific sample size. In light of this, the study applied Slovin's formula, prescribed by numerous scholars as a valuable tool for sample size calculation, with careful consideration given to the specified error tolerance criteria for determining the minimum sample size needed for the study [20]. Research showed that this formula had been widely adopted, recommended, and applied by numerous scholars and researchers, including Osahon [21] and Obianefo [22], across various disciplines for sample size determination. The formula used to determine the sample size is presented below.

$$\frac{N}{1 + Ne^2}$$

where

n = Sample size;

N = Total Population Size;

e = Represents the desired margin of error.

In this study, the total population consisted of 197 health and safety committee members, and a 5% margin of error (0.05) was deemed acceptable. Substituting these values into the formula yields the following.

$$n = \frac{\frac{N}{1 + Ne^2}}{1 + (196)(0.05)^2}$$

$$n = 132$$

This number was considered sufficient to ensure the representativeness of findings while maintaining practical feasibility. Participants were purposively selected from all seven active health and safety committees within the university, with proportional representation across committees. The sample included a diverse range of perspectives, from management to operational staff, and was adequate for achieving thematic saturation in the data analysis phase, aligning with the study's aim to explore the implementation of the university's occupational health and safety management system (OHSMS).

2.5. Sampling

Sampling refers to the process of selecting a subgroup of individuals or units from a larger population for participation in a research study [23]. The primary objective of sampling is to obtain a representative sample of a smaller size that accurately represents the larger population, allowing for valid inferences to be drawn based on the findings of

the selected group [24]. This study adopted a non-probability purposive sampling strategy, which is appropriate for qualitative research where participants must have specific knowledge or experience relevant to the research question. The sample consisted of 132 university staff members who currently serve on various health and safety committees. These individuals were intentionally selected due to their direct involvement with and knowledge of occupational health and safety practices within the institution. This purposive approach ensured the inclusion of participants who are well-positioned to provide relevant, rich, and experience-based insights, thereby supporting the internal validity of the findings. While this method enhances depth and relevance, it is important to note that non-probability sampling limits the generalizability of the results beyond the specific university context. This limitation has been acknowledged in the discussion section and considered in the interpretation of findings.

2.6. Data Collection

This study has employed in-depth interviews, observations, and document analysis as data collection methods.

In-Depth Interviews:

Although a total of 132 participants were purposively selected for this study, not all were involved in traditional, full-length in-depth interviews. Individual interviews were arranged at convenient times and locations, using a questionnaire that combined closed and open-ended questions. Participants were briefed on the study's objectives beforehand, and a confidential environment was maintained to encourage honest responses. Interviews were audio-recorded and supplemented with detailed notes to ensure accuracy. This approach allowed the study to gather in-depth insights from individuals directly involved in OHS management and university-specific health and safety practices.

Observations:

The university conducts monthly emergency evacuation drills. The schedule for these drills was obtained from the OHS department, and approval to observe specific drills was requested from the relevant committee chairpersons. A structured checklist was used to guide observations, focusing on participant behavior, interactions, and the overall evacuation process. Observations were conducted bi-weekly over a three-month period during health and safety committee meetings and evacuation drills. This frequency enabled the researcher to identify recurring behaviors and challenges, providing a more reliable reflection of standard OHS practices. Detailed notes were taken throughout the observation process.

Document Analysis:

A 12-month document review was conducted to provide historical and procedural context for the university's OHSMS. Internally sourced documents included monthly safety reports, incident logs, audits, training records, and health and safety policies. This analysis complemented the interviews and observations, allowing for triangulation across data sources and strengthening the overall reliability and depth of the study findings.

2.7. Data Analysis

The current study used mixed analysis techniques to analyze the qualitative data collected at a public university in South Africa. Given the qualitative nature of the research data that were collected from the university employees and observations, the current study mostly used qualitative coding to analyze the in-depth discussion data from the university employees and observations. The application of qualitative data analysis leads to significant findings that can contribute to theoretical knowledge and practical use, as postulated by Madonsela [20]. In line with this observation, it is suggested that in an instance where the

data are qualitative, the first part of the mixed analysis will be qualitative, and the data will be translated to a quantitative form or quantified at a later stage. Therefore, to identify, organize, and categorize themes within the datasets of the current study, thematic analysis was employed to analyze focus group discussions. The thematic analysis process was combined with inductive logic. Analysis was iterative and reflexive, proceeding through phases. As such, the coding framework was developed based on the themes that emerged from the focus group discussion data. The analysis then proceeded via an inductive and iterative process of listening, reflecting, and coding, and as new themes emerged, the coding framework was progressively expanded. Thematic analysis was conducted manually using Microsoft Excel, which enabled the structured organization of codes and tracking of theme frequency across responses. The coding process followed Braun and Clarke's six-phase model [25]. To improve reliability, two independent researchers initially coded the data. Their coding outcomes were compared, and discrepancies were resolved through discussion to ensure consistency. In addition, peer debriefing with a qualitative research expert and member checking with selected participants were carried out to verify the accuracy of interpreted themes. These strategies enhanced the credibility, transparency, and dependability of the qualitative findings. As the process of coding advanced, several codes were modified, and more codes were discovered and introduced to encompass the complete spectrum of themes found in the data. Once the coding process was completed, data were reviewed and synthesized across discussions, looking for patterns, similarities, and differences.

Subsequently, the data were transformed into numerical codes that could be analyzed statistically. This was achieved through a frequency count; that is, in this step, the number of times each code or theme appeared across all discussions was counted. Subsequently, the occurrences of a particular theme discussed by the focus group were captured in percentage format. This was a fundamental process to highlight percentages, frequencies, and cross-tabulations. This was indispensable to depict the common and recurring issues related to occupational health and safety (OHS) within the university. Consequently, the exploratory data analysis was integrated to present the data in the form of visual models. It is through this process that a schematic framework illustrating the key elements and themes related to OHS practices at the university aids in organizing and relating various themes.

2.8. Validity and Reliability

To ensure the trustworthiness of this study on the efficiency of the OHSMS at a South African university, several strategies were implemented to enhance both reliability and validity. A triangulation approach was adopted, incorporating in-depth interviews, observations, and document analysis. This multi-method strategy allowed for the cross-verification of findings and enriched the depth of analysis. Purposeful sampling ensured that participants and documents were relevant and representative of the OHS context at the university. A continuous analysis process was followed during data collection, allowing for emerging insights to be integrated and confirming existing themes through iterative comparison. A pilot study was conducted to test the data collection instrument, and Cronbach's alpha was calculated to assess internal consistency. A satisfactory score of 0.76 was achieved, indicating acceptable reliability. For data analysis, thematic analysis was guided by Braun and Clarke's six-phase framework [25]. Coding was conducted manually and supported by Microsoft Excel for organizing codes and themes. This process involved familiarization with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report. To enhance validity, peer debriefing and member checking were employed to confirm the accuracy of identified themes. Additionally, the PDCA (plan-do-check-act) cycle, aligned with ISO 45001 standards, was used as a

conceptual lens to guide interview development and theme categorization. This ensured that all critical components of OHSM, such as policy, risk assessment, implementation, evaluation, and management review, were systematically explored.

3. Results

3.1. The University's Commitment Towards Policy Compliance

Concerning the significance of complying with the requirements of the OHS Act 85 of 1993, Figure 1 illustrates the University's commitment towards policy compliance.

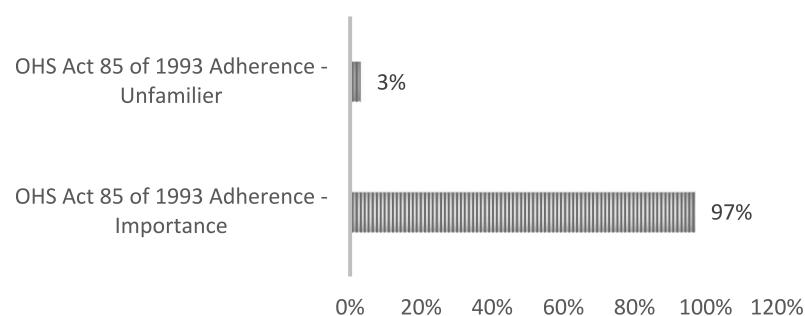


Figure 1. Importance of adhering to the provisions of the OHS Act 85 of 1993.

This study found that 97% of respondents emphasized the importance of adhering to the mandates of the OHS Act 85 of 1993, primarily referencing legal obligations. This demonstrates a strong awareness of legal and ethical compliance within the institution. However, 3% of respondents indicated a lack of familiarity with the Act, suggesting the need for targeted educational efforts.

Although the results of the current study are like those of the study by Adenan [26], which found that the majority of respondents were highly aware of OSH management systems in their workplace, it is important to note that this study was conducted in the context of a wood-based product manufacturing company. The high level of OSH awareness and participation observed might be attributed to the structured OHS schedule, mandatory participation in health and safety activities, and the proactive role of the health and safety officer, which may not directly translate to a university environment where the dynamics and implementation of OHS practices can differ.

3.2. Significance of Establishing an Occupational Health and Safety (OHS) Policy in the University Setting

As depicted in Figure 2, with regards to the significance of establishing an OHS policy in the university setting, all respondents (100%) confirmed the significance of having an OHS policy in place, citing its role in guiding the creation of a safe working and learning environment. While 95% believed the policy was effectively communicated, 5% highlighted gaps in communication strategies, suggesting that improvement is still needed. This does not come as a surprise as universities across the globe are viewed as the body of knowledge, fostering intellectual growth, and setting standards for various fields, including health and safety practices. This discovery closely aligns with the Guidelines on Occupational Safety and Health Management Systems ILO-OSH 2001 [27], which stipulates that an employer must work together with employees and their representatives to establish a documented OSH policy [28].

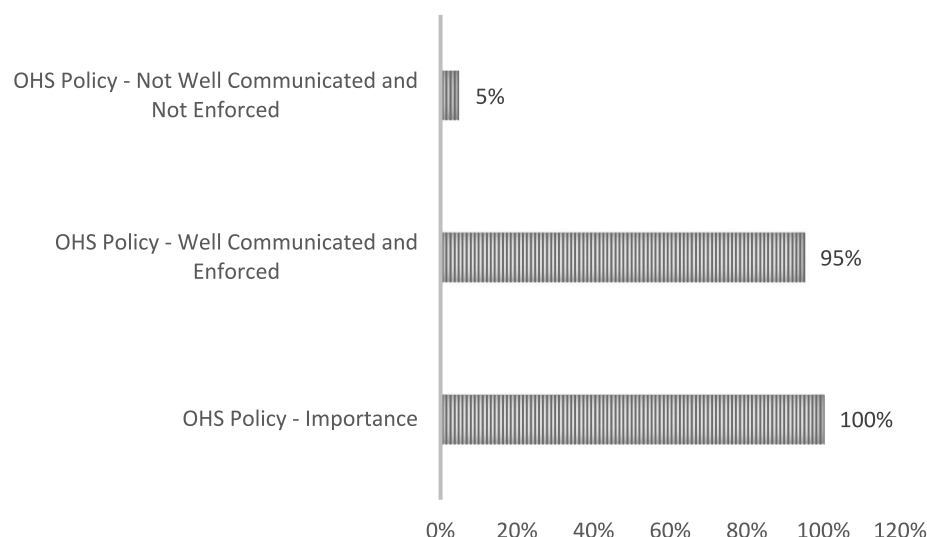


Figure 2. Discrepancies in perceptions of communicating and enforcing the OHS Policy.

3.3. Organizing Roles and Responsibilities for an Effective Implementation of the Occupational Health and Safety Management System

As shown in Figure 3, respondents indicated that 75% comply with the responsibilities outlined in Sections 8 and 14 of the Occupational Health and Safety (OHS) Act 85 of 1993, while 25% admitted to non-compliance. The reasons cited for these included inconsistencies in incident reporting, employee complacency towards hazards, and communication challenges. Ligade [29] asserts that the effectiveness of an OHS system relies on the commitment of all organizational levels and departments, with particular emphasis on the role of senior management. Similarly, Tappuraa [28] emphasizes that the employer bears the primary responsibility for ensuring the safety and health of workers and should lead OSH initiatives within the organization. This includes assigning clear roles, accountability, and authority for the development, implementation, and evaluation of the OHSMS to meet the organization's OHS objectives. In cases where the requirements of Sections 8 and 14 were not met, respondents reported varying levels of compliance issues. These were often attributed to inconsistent incident reporting procedures, employee complacency regarding workplace hazards, communication breakdowns that hindered the effective dissemination of OHS procedures, and challenges related to infrastructure maintenance contributing to unsafe working conditions. These findings highlight the need for targeted improvements to ensure a thorough understanding and consistent implementation of the responsibilities outlined in Sections 8 and 14 of the OHS Act across all departments.

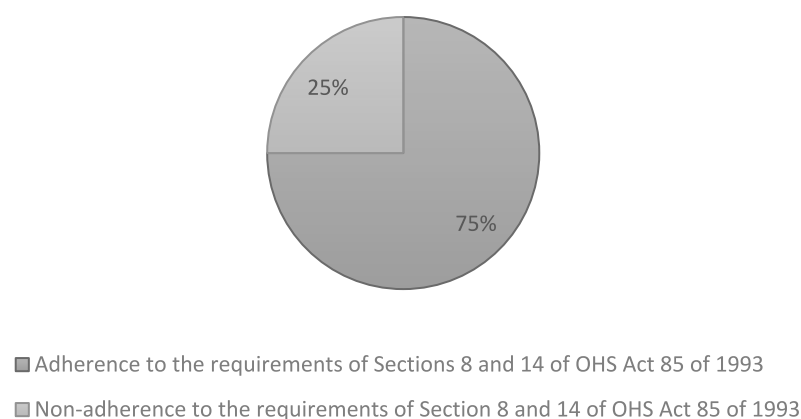


Figure 3. Adherence with the requirements of Section 8 and Section 14 of the OHS Act 85 of 1993.

3.4. Challenges and Barriers in Adhering to the Provisions of Sections 8 and 14 of the Occupational Health and Safety Act 85 of 1993

Respondents were allowed to select multiple challenges they had encountered in implementing the university's occupational health and safety management system (OHSMS). As illustrated in Figure 4, the most commonly reported issue was a lack of infrastructure maintenance and resource shortages (40%), followed by poor communication of hazards and risks (30%), systematic delays such as slow procurement processes (20%), and a lack of training and standard operating procedures (SOPs) (10%). These findings reveal recurring challenges in both the operational and communication aspects of the OHSMS. In the South African context, communication issues are often intensified by language barriers, given the country's eleven official languages [30]. Explaining or translating certain OHS terms into vernacular languages can be challenging, particularly for unskilled laborers [30]. This linguistic diversity underscores the need for clear and inclusive communication channels to ensure that critical safety information is effectively understood by all employees [30].

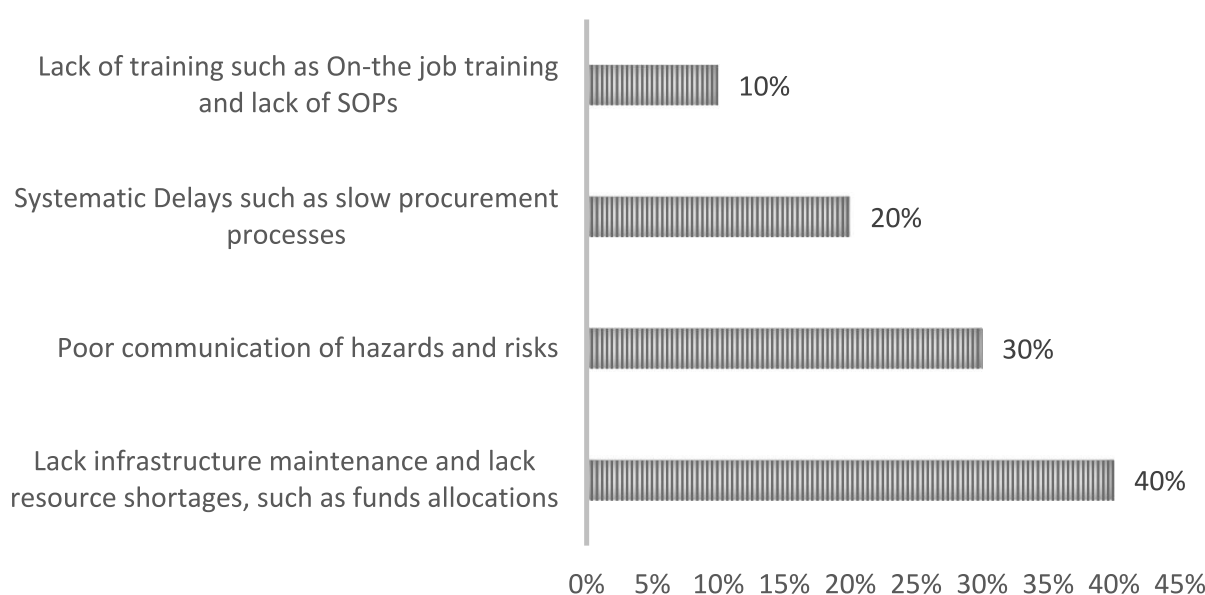


Figure 4. Compliance challenges and barriers.

3.5. The Hazard Identification and Risk Assessment (HIRA) Process in the University

Section 8 of OHS Act 85 of 1993 requires an employer to establish, as far as is reasonably practicable, what hazards to the health and safety of persons are attached to any work that is performed and, as far as is practicable, to establish what precautionary measures should be taken to protect the health and safety of persons (OHS Act 85 of 1993). As illustrated in Figure 5, about 70% of respondents identified hazards through inspections by OHS representatives, while 30% used staff observations and walkabouts. Farmer [31] supports these proactive measures, demonstrating that 86% of respondents are aware of potential hazards in their work environment and consider hazard identification an integral part of their daily responsibilities.

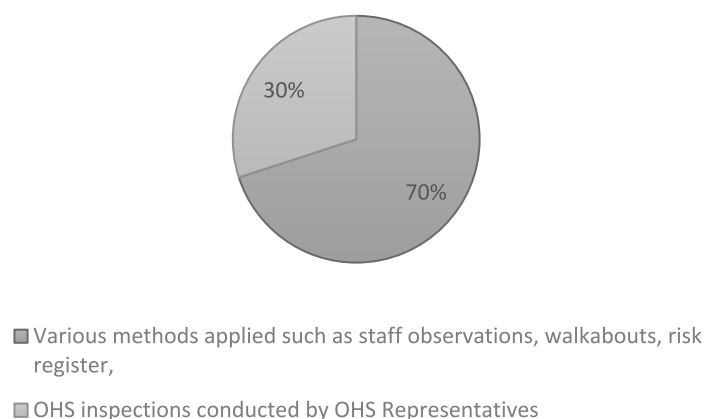


Figure 5. Methods used to identify potential hazards in the university.

3.6. Review the Frequency of Hazard Identification and Risk Assessment

In this case, as illustrated in Figure 6, the majority of respondents reported that these assessments are conducted monthly, reflecting a commitment to ongoing safety monitoring. In contrast, a smaller group of 3% indicated that assessments are conducted both weekly and monthly in specific cases. On the other hand, 5% of respondents stated that no assessments are conducted at all, underscoring areas that may require increased attention. Additionally, 3% mentioned quarterly assessments, and 8% indicated that assessments are conducted regularly or continuously. The “other” category, encompassing 22% of respondents, includes those who were unsure and noted HIRA being conducted once, no review thereafter. According to Subhani [8], hazards and risk identification and assessment should be performed continuously to prevent, control, and reduce them in the future. While the data suggest a strong framework for regular hazard identification and assessment, there are areas where improvements could be made. Enhancing training and communication to ensure consistent assessment schedules across all departments and to address any neglected areas could further strengthen the university’s safety and health management system.

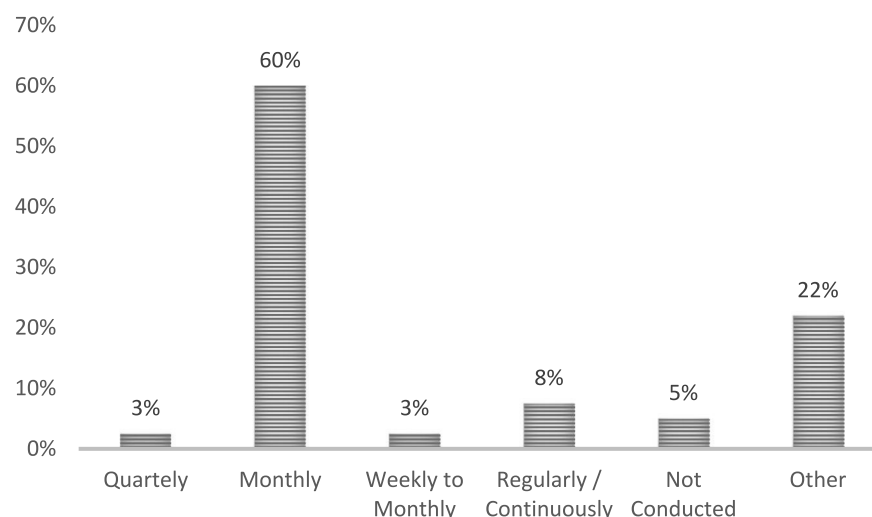


Figure 6. Frequency of review of risk assessment at the university.

3.7. Implementation of Key Components of the Occupational Health and Safety Management System at the University

A comprehensive analysis of the university’s execution of the occupational health and safety management system (OHSMS) unveils crucial insights. In Figure 7, it is shown that 63% of respondents feel that the key components of the OHSMS framework are appropriately handled to uphold health and safety compliance, while 25% of respondents

have raised concerns about the university's non-compliance in implementing specific key components of the OHSMS framework. Additionally, 13% of respondents offered mixed or partial feedback in the study, without specifying the particular key components of the OHSMS framework that are only partially effective or deficient in certain aspects. Common challenges identified include inadequate hazard identification, poor infrastructure maintenance, delayed resource allocation, and weak operational controls, particularly in procurement and maintenance processes. These findings echo Mohammadi's [5] study, which highlighted functional performance and contractor management as persistent issues in OHSMS implementation. Additional concerns included insufficient training (e.g., fire extinguisher use), poor communication of OHS policies, and uneven prioritization of emergency procedures. On the positive side, respondents acknowledged progress in establishing OHS committees, appointing OHS personnel, and providing initial training as required under Section 16.2 of the OHS Act 85 of 1993. These findings emphasize that while some progress has been made, sustained focus on functional performance, resource allocation, and continuous improvement is crucial for advancing OHSMS implementation in the university setting [5].

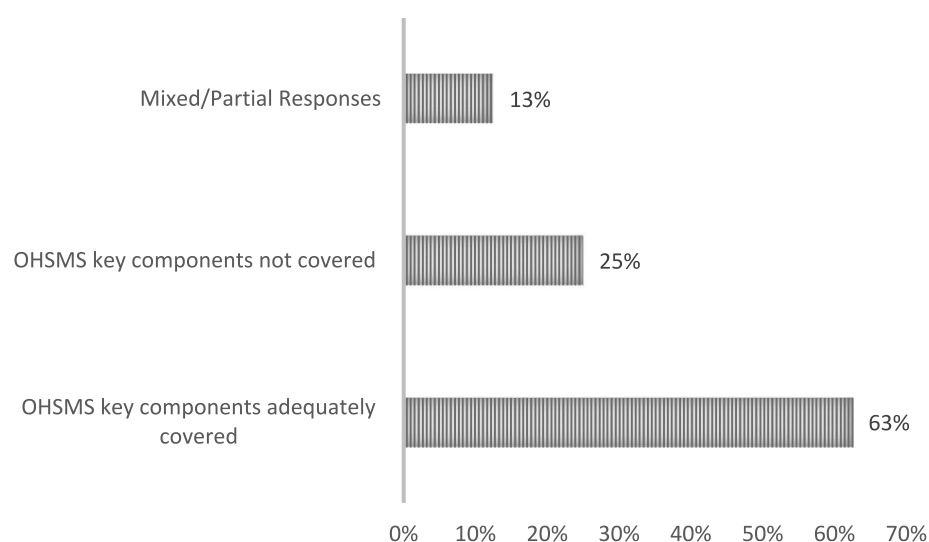


Figure 7. Implementation of OHSMS key components.

3.8. Resource Availability for the Effective Implementation of the Occupational Health and Safety Management System

As illustrated in Figure 8, the majority of respondents indicated that the university provides essential resources to support OHSMS implementation, such as fire equipment, first aid training, and support from the OHS department. However, 35% of respondents disagreed, citing delayed responses to maintenance issues, insufficient financial resources, and a lack of personnel to monitor the quality of contractor or service provider work. This includes instances where compliance requirements such as Certificates of Conformance (COC) for electrical, gas, and plumbing installations and adherence to fire safety regulations are not verified before buildings are put into use. Karanikas [32] underscores the importance of securing adequate resources including staff, infrastructure, and access to information for the successful implementation of OHSMS. Without this support, OHSMS may struggle to function effectively and may compete with other systems for limited resources, hindering integration and overall performance.

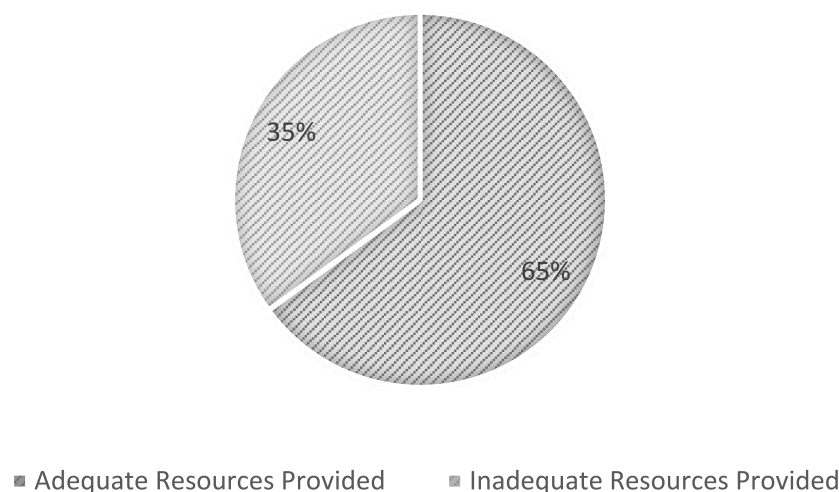


Figure 8. Provision of resources for the implementation of OHSMS.

3.9. Challenges in the Implementation of the Occupational Health and Safety Management System

As illustrated in Figure 9, the challenges associated with implementing an OHSMS are significant, as reported by 92% of respondents who encountered various barriers, while only 8% of respondents reported encountering minimal obstacles. These include a lack of focus on occupational health, such as the need for regular medical surveillance for individuals exposed to biological agents (e.g., cleaners and plumbers), and the failure to enforce health and safety measures (e.g., gardeners neglecting to wear ear protection while operating weed blowing machines). The complexity of implementing an OHSMS in public universities stems from the diversity of environments, laboratories, workshops, lecture halls, and offices, each with unique safety requirements. Limited financial and human resources further constrain effective implementation.

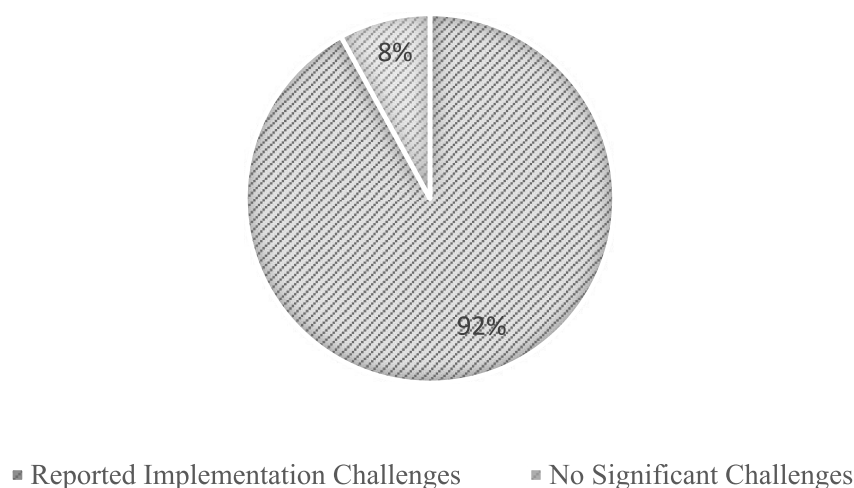


Figure 9. Data reported on OHSMS implementation challenges.

3.10. Indicators for Evaluating and Monitoring OHSMS Performance

When assessing the performance of the university's OHSMS, only a small number of respondents identified the training of OHS representatives as a crucial factor. While this was not widely recognized by participants, it highlights a potential gap in awareness regarding the role of training in effective OHSMS implementation. As illustrated in Figure 10, the most commonly cited performance indicators included the level of compliance with OHS protocols (40%), especially as assessed by the severity of concerns raised by OHS committees such as issues related to infrastructure maintenance. In addition, 30% of respondents

reported relying on incident data (including the number and types of injuries or illnesses) as a key metric for evaluating the OHSMS. This included tracking injury severity, frequency, and identifying recurring hazards over time. Finally, the university's quarterly injury statistics were also considered a meaningful indicator of actual harm experienced on campus, providing insight into how well OHS risks are being managed. Subhani [8] emphasized the importance of structured monitoring and measurement in determining the OHSMS's effectiveness, noting that the absence of formal procedures, audits, and data analysis can render the system ineffective. Similarly, Esterhuyzen [33] stressed that ongoing monitoring, safety audits, and reviews are essential practices that support legal compliance, informed decision-making, and continuous improvement. These findings point to the need for more robust and consistent performance monitoring systems within the university's OHSMS, moving beyond basic reporting towards a culture of proactive and data-driven safety management.

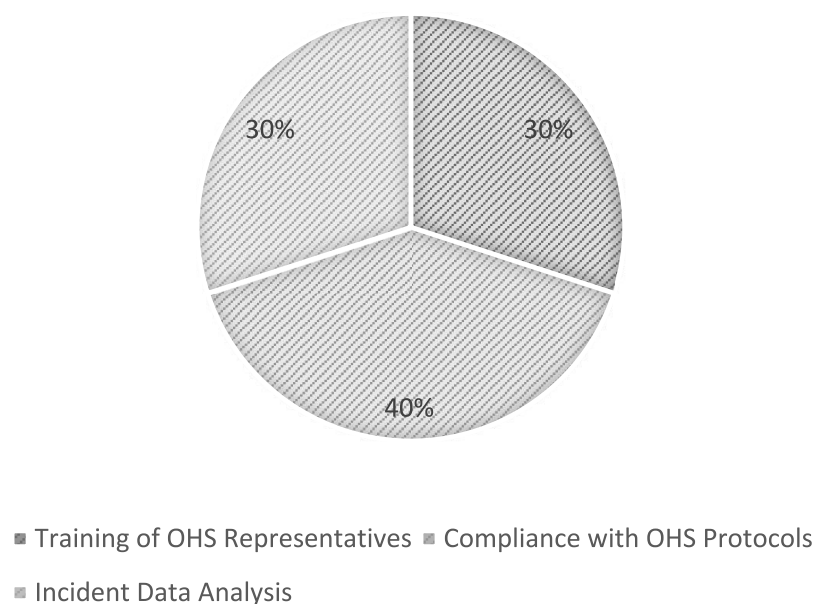


Figure 10. Evaluation of the university's OHSMS performance.

3.11. Management Review of the Occupational Health and Safety Management System Performance

Insights into how respondents perceive improvements in health and safety performance over the past five years are fraught with dichotomic views. As illustrated in Figure 11, 50% of the respondents acknowledged progress, pointing to better incident reporting and a heightened focus on health and safety discussions. On the other hand, around 40% expressed concerns about the lack of sufficient efforts to address health and safety effectively, while 10% were still in the process of observing changes or did not have clear answers. Subhani [8] found that universities lacking formal management reviews often failed to drive continual improvement, even when audits were conducted. Similarly, Brijlall [34] emphasized that management reviews are essential for evaluating indicators, incidents, and feedback to improve OHSMS effectiveness. To ensure sustained progress, dedicated OHSMS review mechanisms are necessary for identifying performance gaps and guiding targeted improvements.

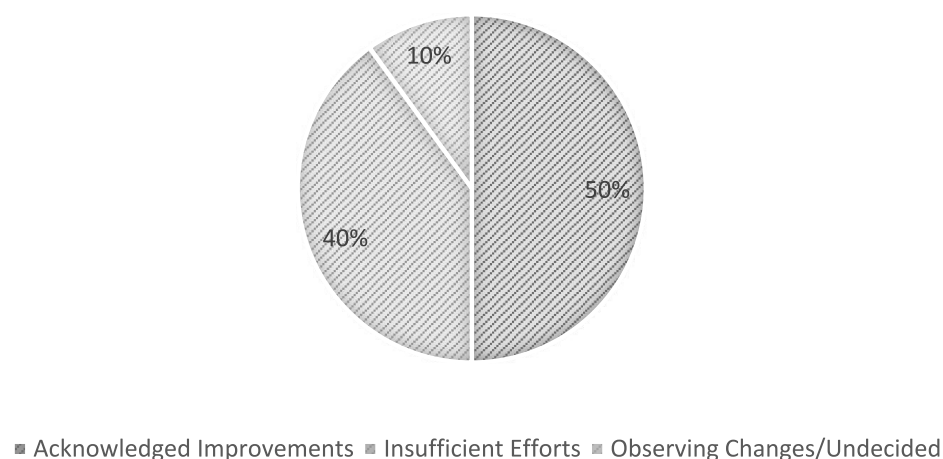


Figure 11. Perceptions of OHS performance improvement over the past five years.

3.12. Observations of Roles, Attitudes, and Behaviors During Evacuation Drills in a University Setting

The majority of participants, including staff and students, demonstrated a strong adherence to emergency procedures under the guidance of various personnel such as OHS representatives, fire marshals, heads of department (HODs), fire safety officers, and security officers. This indicates a clear understanding of their respective roles in emergencies. Support was effectively provided to individuals requiring additional assistance, such as those using wheelchairs, reflecting a commitment to ensuring the safety and well-being of all individuals involved. The emergency team, comprising OHS representatives, fire marshals, heads of department (HODs), fire safety officers, and security officers of the university, effectively communicated essential information during the drill and followed prescribed protocols for shutting down equipment and safeguarding important documents. They successfully guided the majority of participants to their designated emergency exits calmly and promptly, ensuring that everyone was safely gathered at designated assembly points.

3.12.1. Attitude of Participants Observed During the Emergency Evacuation Drill

Observation of a positive attitude was noted through strong adherence to evacuation procedures and helping others, reflecting a favorable disposition toward safety protocols. Effective leadership, clear communication, and well-coordinated emergency procedures demonstrated by the emergency team had a substantial impact on how participants responded to safety protocols. A well-organized and structured drill instilled confidence, demonstrated teamwork, and fostered a culture of safety among participants, regardless of their educational backgrounds. Conversely, a negative attitude was observed on one of the campuses, where some participants hesitated to evacuate as they recognized it was a drill, revealing a lack of seriousness. Instances of confusion in some campuses highlight the necessity for improved training or clearer communication. These findings align with those of Al-Zyoud [35], as cited by Carvalhais [36], who emphasizes that attitudes toward safety protocols significantly influence emergency preparedness. Poor staff response can negatively affect students' perception and behavior. Carvalhais [36] further suggests using engaging strategies like game-based learning to improve fire safety awareness and attitudes. Addressing these attitude-related challenges through targeted, interactive training can enhance emergency readiness and foster a more proactive safety culture.

3.12.2. The Behavior of Participants Observed During the Emergency Evacuation Drills

Common behaviors observed during evacuations include backtracking to retrieve forgotten items, rushing, delays, and panicking. These behaviors highlight the need for im-

provements in emergency preparedness, such as better training, enhanced communication, and effective stress management strategies. Specifically, the current study's participants displayed negative attitudes and confusion, further underscoring the necessity of addressing these psychological factors to improve evacuation processes and safety outcomes. Bahmani [37] observed similar behavioral patterns, such as “backtracking” (returning to retrieve personal belongings), which delays evacuation. This behavior is common across age groups and influenced by psychological factors like anxiety and panic. Chang [38], as cited by Bahmani [37], also noted that even trained individuals may panic if they lack real-life evacuation experience, underscoring the importance of disaster preparedness training. Similarly, Lovreglio [39] found that pre-evacuation behaviors such as group clustering and retrieving belongings significantly increase evacuation time. These findings highlight the need for improved communication, targeted training, and stress management strategies during drills. The behaviors observed in this study, particularly confusion and panic, reinforce the importance of addressing psychological readiness and enhancing evacuation planning to ensure safer and more efficient responses during emergencies.

3.13. Document Review of Occupational Health and Safety Records

According to Constantine [40], organizations should document their OHSMS processes in line with relevant standards, while the ILO-OSH [27] emphasizes that documentation must be clear, regularly reviewed, revised when necessary, and easily accessible to all stakeholders. OHS records should also be identifiable, traceable, and assigned specific retention periods. In this study, a thorough review of various documents revealed key insights into the university's OHS practices. The reviewed documents included the OHS policy, OHS procedures, hazard identification and risk assessment registers, incident statistics reports, OHS training records, and records of OHS committee establishments. These documents, sourced from digital files, physical archives, departmental repositories, and stakeholders, provided valuable information on the university's safety protocols and practices. The findings from this document review are as follows.

3.13.1. Review of Occupational Health and Safety Policy of the University

The university recently approved an occupational health and safety policy endorsed by the Vice-Chancellor and scheduled for review every five years. The policy commits to maintaining a safe environment for all stakeholders, in alignment with the OHS Act 85 of 1993. It outlines goals such as zero incidents, regular risk assessments, legal compliance, waste reduction, training, and continuous performance improvement.

These findings highlight both the strengths of the policy and areas requiring greater compliance and visibility. Although aligned with Section 7 of the OHS Act, the policy is not visibly displayed, as required by Section 7(3). Subhani [8] emphasizes that visible and accessible OHS policies, developed and supported by senior management, are essential for demonstrating a strong commitment to health and safety. Similarly, institutions like ANU, Imperial College London, and the University of Gävle have established comprehensive policies to ensure stakeholder safety [8].

3.13.2. Review of Occupational Health and Safety Procedures

In line with Section 7(2) of the OHS Act 85 of 1993, the university's OHS department has developed several key procedures to support the implementation of its Health and Safety Policy. These include protocols for incident reporting, role clarification, hazard identification, OHS training, and emergency drills designed to manage health, safety, and environmental risks effectively.

Section 14(c) of the Act requires employees to follow lawful health and safety instructions issued by the employer. Rahmi [41] emphasizes the need for clearly defined and

regularly updated procedures to ensure the effectiveness of OHSMS. Similarly, Maseko [15] highlights the employer's duty to implement safe operational procedures to reduce risk exposure. Although progress has been made, some protocols remain under development, indicating ongoing efforts to strengthen the system. These findings highlight the critical importance of management commitment and clear procedural guidance in advancing OHS performance.

3.13.3. Review of Hazard Identification and Risk Assessment Registers

The university's OHS department has developed a risk register template for departments and faculties to document hazards and implement preventive measures. While this is a step toward compliance with the Occupational Health and Safety Act 85 of 1993, this study found that these registers are not reviewed regularly, as required. Maseko [15] emphasizes that conducting and maintaining risk assessments is a legal obligation under Section 12(1)(a) of the revised Act. The absence of proper and updated assessments can lead to increased employee injury risks and financial consequences for employers, including compensation claims and operational disruptions. Although the implementation of the risk register template is a positive development, its effectiveness is undermined by the lack of regular evaluations. Consistent review and enforcement of control measures are essential for improving workplace safety, reducing financial risk, and ensuring alignment with legal and best practice standards [15].

3.13.4. Evaluation of Incident Reports

As shown in Table 1, the total number of reported incidents showed slight fluctuation between 2021 and 2023, with a dip in 2022 and a rise to 37 cases in 2023. Notably, near-miss incidents consistently declined to zero by 2023, and first aid cases dropped to just one. However, more serious cases, such as those requiring medical attention and disabling incidents, increased in 2023. No fatalities were reported during this period, with only one case of occupational disease in 2022. While the decline in near-misses and minor injuries is positive, the rise in severe incidents highlights areas for urgent improvement, particularly in reducing disabling injuries and doctor-treated cases. Mohammedi [5] stresses the importance of analyzing incidents and near-misses to prevent recurrence through corrective action. Esterhuyzen [33] supports using compensation data as a performance indicator for OHSMS, while Maseko [15] emphasizes the role of employee involvement in reporting unsafe conditions. These findings also reflect gaps in adherence to Sections 14(d) and 14(e) of the OHS Act 85 of 1993, which require employees to report unsafe conditions and incidents promptly.

Table 1. Annual incident report (2021–2023).

Year	2021	2022	2023
Total number of incidents	35	33	37
Near-misses	2	1	0
First aid	5	4	1
Doctor cases	4	5	9
Disabling incidents	24	22	27
Fatalities	0	0	0
Occupational disease	0	1	0

3.13.5. Occupational Health and Safety Training Records

OHS Representatives Training

According to the records, there has been a consistent decline in the attendance of participants in OHS representatives' training each year, indicating a potentially reduced necessity or a shift towards alternative training methods or topics.

First Aid Training (Level 1)

First Aid Level 1 training participation declined in 2022 but rose sharply in 2023, marking the highest number of participants in the three-year period. This upward trend may indicate a renewed institutional emphasis on first aid readiness. Lingard [42] found that first aid training contributes to reduced workplace injuries and heightened safety awareness. Trained individuals were more likely to adopt safe behaviors, suggesting that first aid training not only enhances emergency response capabilities but also supports broader OHS objectives by serving as a motivational tool within OHS training strategies.

Training of Fire Marshals

In the study by Adisa [43], several concerns were raised regarding fire safety in student housing facilities (SHFs). These included dysfunctional fire alarms due to vandalism, the absence of smoke detectors and sprinkler systems, infrequent safety inspections caused by personnel shortages, and the lack of a designated fire marshal. As a result, the study emphasized the need for continuous training. This current study observed an increase in participation in fire marshal training from 2021 to 2022. However, there were no participants in 2023, possibly due to financial constraints. Although fire safety training is one of the services offered, a review of training records showed that—beyond the initial training provided to OHS representatives, first aiders, and fire marshals upon appointment—employees did not receive regular refresher training to enhance their preparedness and ability to perform their roles effectively.

Legal Liability Training for Heads of Departments

Interest in legal liability training has been on the rise, starting with 7 participants in 2022 and increasing to 17 in 2023. Therefore, maintaining a variety of continuous OHS training programs, including OHS representatives, first aid, fire marshal, and legal liability training, is essential for upholding and enhancing workplace safety. These programs ensure compliance with legal obligations, cultivate a culture of safety, and equip employees with the essential skills to effectively manage emergencies. Overcoming challenges related to funding and participation, particularly in critical training domains, is crucial for sustaining these advantages. Tappura [28] highlights the importance of leadership training for managers, emphasizing their pivotal role in driving OHS performance. This is particularly notable given that the OHSAS 18,001 specification does not explicitly prioritize manager training or outline appropriate development actions.

3.13.6. Review Records on the Establishment of Occupational Health and Safety Committees

According to Section 19 of the Occupational Health and Safety Act 85 of 1993, employers are required to establish a health and safety committee when two or more health and safety representatives are appointed [44]. One of the committee's key responsibilities is to convene health and safety meetings at least once every quarter.

This research examines the university's OHS department and its ongoing efforts to monitor progress toward the goal of establishing 12 OHS Committees. As shown in Figure 12, there has been a steady annual increase in the number of committees formed:

33.3% of the target was achieved in 2021, 50% in 2022 (with 6 committees), and 67% in 2023. Maseko [15] emphasizes that forming a safety committee is vital for effective safety management, especially when leaders act on the committee's recommendations to foster a strong safety culture among staff and students.

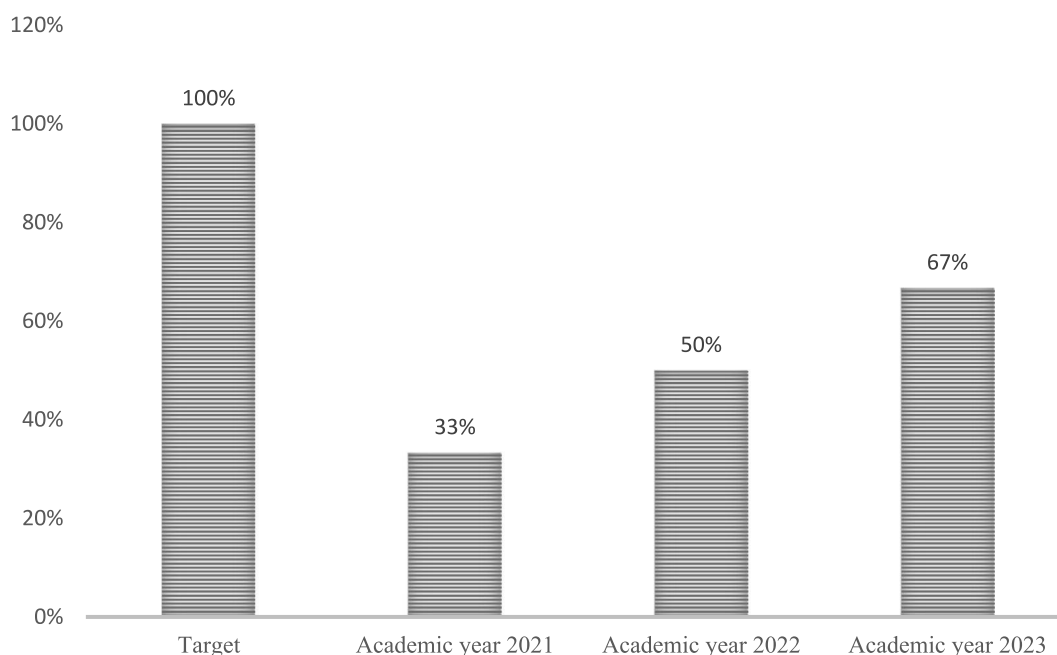


Figure 12. Development of OHS committees compared to target (2021–2023).

It is therefore recommended that the university identify and address barriers that hinder progress toward this target. This includes ensuring the availability of sufficient resources, such as personnel, funding, and training, and strengthening stakeholder engagement and awareness about the significance and benefits of fully functional OHS committees.

4. Discussion

This study's findings affirm the presence of an OHSMS within the university, but they also highlight implementation challenges. The strong policy compliance rates and stakeholder role clarity are encouraging, aligning with the findings of [45]. However, gaps in policy communication and enforcement, as noted by 5% of respondents, echo concerns identified by Delvika [46] regarding communication inefficiencies. The discrepancy between policy awareness and policy execution mirrors Pilusa's [47] findings, where knowledge of the OHS legislation did not always equate to full understanding or practice. This also aligns with Muthelo [48], who emphasized communication and behavioral barriers in mining, suggesting that such challenges extend into academic institutions.

Hazard identification practices were mostly inspection-based, confirming Orymowska's [49] call for proactive safety management. Yet, variation in HIRA review frequency indicates inconsistency, aligning with Letoana's [50] argument for more rigorous and regular assessments. Subhani [8] also argues that despite the existence of tools like HIRA registers, their effectiveness is diminished when reviews are not conducted consistently.

Resource-related challenges, including financial and personnel limitations, resonate with findings by Mohammedi [5] and Okechukwu [51], who identified similar barriers in both academic and industrial sectors. These limitations impact infrastructure maintenance, access to training, and the availability of safety equipment, all of which are essential components of effective OHSMS implementation. The university's situation reflects the broader

challenges experienced by many institutions in developing countries, where budgetary constraints often restrict the comprehensive implementation of OHS protocols.

The inconsistency in training participation observed in the university setting supports Lingard's [42] emphasis on the need for ongoing and inclusive safety training. A lack of refresher sessions or updates was evident in the training data, particularly in the case of fire marshal and legal liability training, suggesting a possible disconnect between policy and practice.

The behavioral aspects of emergency preparedness, revealed through the evacuation drills, align with Bahmani [37] and Lovreglio [39], who emphasize the impact of panic, confusion, and psychological factors on emergency response. These findings show that having systems in place is not enough and that attention must also be paid to behavior, training engagement, and mental preparedness. The importance of leadership and communication during emergencies is further supported by studies like that of Aslam [52], which suggests that strong coordination by emergency personnel can influence the success of drills.

Document reviews provided further insight into the university's efforts to establish a sound OHS foundation but also exposed inconsistencies in documentation display, review cycles, and policy visibility issues, as noted in Subhani's [8] study on policy implementation gaps. Without visible and regularly updated documentation, awareness and compliance may be compromised.

Lastly, evaluation mechanisms such as incident tracking and committee reports are in place, but reliance on inconsistent or underused metrics may weaken their effectiveness. The study by Esterhuyzen [33] recommends the integration of both leading and lagging indicators, along with internal audits and formal management reviews, to ensure systematic OHSMS evaluation and improvement. At the university, the absence of a formal management review cycle limits the potential for continuous improvement, even though platforms like Vice-Chancellor forums contribute to general OHS discussions.

5. Conclusions

This study aimed to assess the occupational health and safety management system (OHSMS) at a university in South Africa and addressed three core objectives: to determine the existence of an OHSMS, to examine stakeholder roles and responsibilities in its implementation, and to evaluate its overall effectiveness. Findings confirmed that an OHSMS is in place, supported by structured policies, procedures, and committee-based safety governance. Stakeholder roles, particularly those outlined in Sections 8 and 14 of the OHS Act 85 of 1993, were generally understood and implemented by 75% of respondents. However, gaps were evident in reporting consistency, communication of responsibilities, and employee engagement, highlighting the need for targeted training and stronger accountability mechanisms. The university's commitment to compliance was encouraging, yet implementation challenges remain. Key concerns include inconsistent hazard reviews, insufficient training frequency, procedural delays, infrastructure limitations, and resource constraints. These issues directly impact the system's ability to proactively manage health and safety risks. The discussion aligned these findings with other studies across sectors and institutions, showing that challenges such as communication breakdowns, behavioral barriers, resource limitations, and leadership gaps are commonly shared. Comparisons with studies by Pilusa [47] and Muthelo [48] confirm that the effectiveness of OHSMS depends on both policy presence and practical execution. Limitations of this study include its focus on a single institution and the use of purposive sampling, which may restrict the generalizability of results. Future research could benefit from multi-university studies, longitudinal evaluations, and a deeper exploration into leadership commitment and institutional safety culture. To enhance OHSMS outcomes, the university should prioritize

regular hazard assessments, improve documentation and visibility, address training gaps, ensure consistent stakeholder engagement, and strengthen monitoring systems. By doing so, the OHSMS can evolve into a more effective, proactive, and sustainable framework that supports the safety and well-being of all university stakeholders.

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