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A SURVEY OF OCCUPATIONAL HEALTH AND SAFETY PRACTICES AMONG STAFF OF LOWER USUMA DAM WATER TREATMENT PLANT BWARI, ABUJA

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ABSTRACT

This study examines the occupational health and safety (OHS) practices among staff at the Lower Usuma Dam Water Treatment Plant in Bwari, Abuja. Utilizing a descriptive survey research design, data was collected from 200 employees, with 192 completed questionnaires retrieved. The findings revealed that 90.6% of respondents received training on OHS practices, while 84.9% were aware of their rights to participate in safety decision-making processes. A significant majority (82.3%) indicated that regular assessments are conducted to identify workplace hazards. The results also showed a strong positive correlation ($r = 0.743$, $p = 0.01$) between OHS practices and workplace environment quality, suggesting that enhanced safety measures contribute to improved employee health and productivity. However, a notable gender imbalance was observed, with 89.1% of respondents being male. These findings highlight the necessity for continuous training and initiatives to foster a culture of safety within the organization.

Keywords: Occupational health and safety, water treatment plant, workplace environment, employee training, risk assessment, safety practices, Abuja.

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Introduction

Occupational health is a multi-disciplinary activity aimed at the protection and promotion health of workers by preventing and controlling occupational diseases and accidents and by eliminating occupational factors and conditions hazardous to health and safety at work, it also aimed to the development and promotion of healthy and safe work, work environments and work organizations, the enhancement of the physical, mental and social well-being of workers enabling workers to conduct socially and economically productive lives and to contribute positively to sustainable development (Awogbami et al., 2021). Occupational health and safety (OHS) practices are vital for protecting employees in industrial settings, particularly in facilities such as water treatment plants. Effective OHS measures not only safeguard workers from potential hazards but also enhance productivity and morale (Kines et al., 2010).

Occupational health and safety (OHS) practices are essential for ensuring a safe working environment, particularly in industries that involve significant hazards, such as water treatment facilities. The Lower Usuma Dam Water Treatment Plant in Bwari, Abuja, is a critical infrastructure that provides clean water to the community, making the health and safety of its staff paramount for operational success. Effective OHS measures not only protect employees from potential hazards but also enhance productivity and overall morale in the workplace. Research has shown that workers in water treatment plants face a variety of occupational hazards, including exposure to harmful chemicals and the risk of accidents related to machinery and equipment (Useche et al., 2019); (Awogbami et al., 2021). For instance, the risk of chlorine gas leaks poses significant health threats within this industrial environment (Lin & Chan, 2009). To mitigate these hazards, it is crucial to implement control measures such as personal protective equipment (PPE) and comprehensive hazard management practices, including emergency response training and regular safety assessments (Opele, et al, 2021). In the water treatment industry, workers face various occupational hazards, including exposure to chemicals, with the risk of chlorine gas leaks posing significant threats to safety and health within the industrial environment. To mitigate these potential hazards, control measures such as using personal protective equipment are essential. Additionally, implementing robust hazard management practices and occupational safety and health programs such as work permit issuance and emergency response training proves invaluable in addressing identified risks.

The International Labour Organisation (ILO) reports that more than 300 million occupational injuries and at least 320,000 fatal workplace incidents occur annually (Flouris et al., 2018). Furthermore, approximately two million fatalities are attributed to work-related illnesses each year, bringing the combined annual toll from occupational injuries and diseases worldwide to an estimated 2.3 million (Nigeria Country Profile on Occupational

Safety and Health, 2017). Similarly, (Igwe et al., 2022) emphasizes that organizations have both a moral and legal duty to provide a safe work environment and reduce potential risks. They asserts that cultivating a safety-conscious culture is achievable when organizations are proactive in addressing safety concerns. Thus, fostering a positive safety culture by recognizing safe behavior with rewards, promotions, and financial incentives, which in turn motivates workers to act safely, thereby reducing human errors that may lead to unsafe conditions. Besides, employees' awareness of safety practices can significantly influence their engagement in safe work behaviors and willingness to report hazards. Studies have indicated that a substantial percentage of workers in Nigeria and other developing countries have received insufficient training on OHS practices, resulting in a reliance on PPE that is often inconsistently utilized (Awogbami et al., 2021). The International Labour Organization (ILO) highlights the alarming statistics surrounding workplace injuries and fatalities, underscoring the need for robust safety management practices to protect workers.

Statement of the Problem

The Lower Usuma Dam Water Treatment Plant in Bwari, Abuja, is essential for providing clean water, making the health and safety of its staff critical to operational success. Despite the recognized importance of OHS, there remains a gap in understanding the current state of these practices within the context of the Lower Usuma Dam Water Treatment Plant. Research indicates that comprehensive training programs, adherence to safety regulations, and the establishment of safety committees are fundamental to fostering a culture of safety (Gambo, 2020). The prevailing issue at the Lower Usuma Dam is the insufficient awareness and implementation of occupational health and safety practices among staff. This lack of engagement can lead to increased risks of workplace accidents, undermining both employee well-being and operational efficiency. Despite the importance of OHS practices, many workers lack adequate knowledge and awareness of safety protocols, which can lead to increased risks of injuries and illnesses. This study aims to survey the occupational health and safety practices among staff at the Lower Usuma Dam Water Treatment Plant. By examining the level of awareness regarding safety practices, training received, and the overall quality of the work environment, this research seeks to provide insights into how effective safety management can enhance employee well-being and operational efficiency. Understanding these dynamics is crucial for fostering a culture of safety that not only protects workers but also promotes the sustainability of critical infrastructure services.

Objective

The main focus of this study is to assess the occupational health and safety practices among staff of lower usuma dam water treatment plant Bwari, Abuja. The specific objectives are to:

1. analyze the socio-demographic characteristics of respondents at the

Lower Usuma Dam Water Treatment Plant, including gender, educational level, duration of employment, and type of appointment.

2. assess the levels of awareness regarding occupational health and safety practices among staff, including training received and knowledge of relevant safety regulations.
3. evaluate the utilization of occupational health safety assessments and the existence of health and safety committees at the workplace.
4. investigate the impacts of occupational health safety management practices on the work environment and employee safety perceptions.

Methodology

This study employed a descriptive survey research design to explore occupational safety and health (OSH) practices within the water treatment sector, specifically at the Lower Usuma Dam Water Treatment Plant in Bwari, Abuja. The descriptive approach served as a framework for understanding the current state of OSH and its influence on the work environment. By focusing on typical challenges faced in this industry, the research aimed to gather nuanced insights into the opinions and experiences of employees regarding the identified variables. The target population consisted of all individuals working at the water treatment plant and residents in the area. A sample size of 200 was determined, with 192 completed questionnaires retrieved through random sampling. Additionally, purposive sampling was used for conducting semi-structured interviews, allowing for in-depth exploration of specific topics related to OSH practices. Data collection was facilitated through a self-administered semi-structured questionnaire, which combined both qualitative and quantitative methods to capture relevant biodata and assess independent and dependent variables. To ensure the validity and reliability of the instruments, the questionnaire was reviewed by supervisors and experts, focusing on content validity and the stability of measurements over time. Ethical approval was obtained from the university's ethics committee, and informed consent was secured from respondents, ensuring confidentiality throughout the study. Data processing involved verifying the collected information for consistency, followed by analysis using the Statistical Package for Social Sciences (SPSS). The results were presented in tables using percentages to provide a clear overview of the findings and facilitate interpretation of the data in relation to OSH practices and workplace safety.

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Table 1: Respondents Socio-demographic characteristics

Characteristic	Categories	Percentage
Gender of the respondent	Male	171 (89.1%)
	Female	21 (10.9%)
Educational Level of the respondent	Primary	14 (7.3%)
	Secondary	39 (20.3%)
	Tertiary	139 (72.4%)
Duration worked in the organization	1 - 5 years	34 (17.7%)
	6 - 10 years	51 (26.6%)
	11 - 15 years	73 (38%)
	>15 years	34 (17.7%)
Type of appointment with the organization	Permanent	124 (64.6%)
	Casual	43 (22.4%)
	Volunteer	25 (13%)

Table 1 shows that 171 (89.1%) of the respondents were males while the least at 21 (10.9%). Given that the selection was done randomly, it meant that there were more male than female in the Lower Usuma Dam water treatment plant Bwari, Abuja.Most of the respondents at 139 (72.4%) had obtained tertiary level qualification as their highest level of learning, 39 (20.3%) attained secondary school as their highest level of education while the minority at 14 (7.3%) had obtained primary school certificate as their highest qualification. Preponderance of the respondents at 73 (38%) spent between 11 – 15 years working with the organization, while 51 (26.6%) of the respondents spent between 6 – 10 years with the organization, where both the respondents between 1 – 5 years of experience and 15 years and above making 34, 34 (17.7% and 17.7%) respectively. On the type of appointment of the respondents with the organization, most respondents at 124 (64.6%) are permanent staff, and 43 (22.4%) of the respondents are casual while the minority of the respondents at 25 (13%) are working as volunteer in the organization.

Table 2: Levels of awareness of occupational health and safety practices among staff in lower Usuma Dam water treatment plant Bwari, Abuja

S/N	Statement	SA	A	D	SD
1	I have had a training on occupational health and safety at the workplace	50%	40.6%	5.2%	4.2%
2	I am aware of the existence of safety and health Act of 2007	46.9%	43.8%	6.2%	3.1%
3	It is critical for staff to master occupational safety regulation	42.2%	40.6%	8.3%	8.9%
4	I have a right to be part of the process of identifying and resolving workplace health and safety concerns	46.4%	38.5%	10.4%	4.7%
5	It is important to report injury or illnesses Immediately	40.6%	45.8%	11.5%	2.1%
6	Workers should be instructed to follow safe working practices	43.8%	36.9%	10.9%	8.3%

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Majority of the despondence at 174 (90.6%) received training on occupational health and safety at the workplace and only 18 (9.4%) does not received a training on occupational health safety at the workplace. Preponderance of the respondents at 174 (90.6%) were aware of the existence of safety and Health Act of 2007, 18 (9.3%) were unaware of the existence of Safety and Health Act of 2007. A good number of the respondents at 159 (82.8%) were aware that it was critical for a staff to master occupational safety regulations and very few at 33 (17.2%) were unaware that the mastering of occupational safety regulations would be critical. This finding was largely supported by Occupational Safety and Health Act. 2007 objective that states that arrangements for ensuring safety and absence of risks, to health in connection with the use, handling, storage and transport of articles and substances should be in place with the provision of such information, instructions, training and supervision necessary to ensure the safety and health at work of every person employed so as to promote and improve occupational safety and health standards.

Majority of the respondents at 163 (84.9%) were aware of that they had a right to be part of the processes of identifying and resolving workplace health and safety concerns and few among the respondents at 29 (15.1%) were unaware of this right. Moreover, on the right of decision making in the workplace, these findings were convergence with one of the occupational Safety and Health Act of 2007 that ensures that every employee should participates in the application and review of safety and health measures in promotion and improvement of occupational safety and health standards. A good number of respondents at 166 (86.5%) agreed on to report on any injury or illness immediately while only few of the respondents at 26 (13.5%) had a different view. Majority of the respondents at 155 (80.7%) agreed that workers should be instructed to follow safe working practices, while other respondents at 37 (19.3%) had a different opinion from that of the majority, this study by explaining that employees need to be adequately instructed and trained in safe systems of work such as safe methods for carrying out tasks, safe use of equipment or substances, use of health and safety control measures and personal protective equipment, accident reporting and emergency procedures and their responsibilities for health and safety.

Table: 3. utilization of occupational health safety hazards on work environment among staff in lower Usuma Dam water treatment plant Bwari, Abuja

S/N	Statement	SA	A	D	SD
1	Assessments are usually done to identify risks hazards in the workplace.	44.8%	37.5%	8.3%	9.4
2	There is a health and safety committee constituted by staff which meets regularly to review health and safety at the workplace.	44.8%	39.6%	12.5%	3.1%
3	The employer promotes safety awareness and information among staff.	40.6%	34.4%	13%	12%

4	There is always orientation program for new staff on health and safety.	47.4%	41.7%	4.1%	6.8%
5	Performance on Health and safety is regularly evaluated in our workplace.	44.8%	40.1%	12.5%	2.6%
6	I have had any previous accidents or injuries in the work place.	45.8%	37%	7.3%	9.9%

Most of the respondents at 158 (82.3%) noted that the assessments were usually done to identify risks and hazards in the workplace while the minority of the respondents at 34 (17.7%) were on the opposing side. Preponderance of the respondents at 162 (84.4%) noted that health and safety committee constituted by staff met regularly to review health and safety at the workplace while 30 (15.6%) had a different opinion from the majority. This is in agreement with WASREB, 2015 report that both very large and large utilities have maintained acceptable levels of staff productivity due to water sector reforms under the Water Act 2002. This has since heavy investments that have since revived formerly dilapidated infrastructure. The introduction of WASREB regulations on performance of utilities by agents could be contributing to the progress. Majority of the respondents at 144 (75%) stated that the employer promoted safety awareness and information among staff of the organization while few among the respondents at 48 (25%) were divergent with the opinion. Most of the respondents at 171 (89.1%) stated that there was always an orientation program for new staff on health and safety while the minority of the respondents varied with the opinion. The predominant of the respondents at 163 (84.9%) stated that performance on health and safety in their workplace was regularly evaluated while the least of the respondents at 29 (15.1%) of the respondents had divergent opinion from the majority. This is in agreement with WASREB, 2015 report that both very large and large utilities have maintained acceptable levels of staff productivity due to water sector reforms under the Water Act 2002. This has seen heavy investments that have since revived formerly dilapidated infrastructure. The introduction of WASREB regulations on performance of utilities by agents could be contributing to the progress.

Majority of the respondents at 159 (82.8%) stated that they had no previous accidents or injuries in the workplace while the least of the respondents at 33 (17.2) stated that they had previous accidents or injuries in the workplace. A similar study conducted by Ng'ang'a *et al.*, (2013), revealed that the construction industry's appalling health and safety record is a worldwide problem affecting both the developed and un-developing countries. Very few statistics though exist on the nature of accidents and injuries affecting workers in developing countries primarily due to the poor or nonexistence of regulatory framework. However, health and safety data collected in developed countries shows a consistent pattern for workers fatalities and injuries. As the nature of construction works is similar in both developed and developing countries, the problems reported in the industrialized world do not appear

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particularly "high tech". As the data from developing countries are so scarce it would appear reasonable to assume that the types of fatalities and injuries are similar worldwide.

Table 4: Impacts of occupational health safety management practices on work environment among staffs in lower Usuma Dam water treatment plant Bwari, Abuja

S/N	Statement	SA	A	D	SD
1	The employer enforces health and safety regulations	44.8%	36.5%	13%	5.7%
2	The employer always corrects unsafe acts and unsafe conditions	43.7%	41.7%	9.9%	4.2%
3	The employer ensures that the personal protective equipment was available to all staff all the time	41.1%	44.8%	9.9%	4.2%
4	Performance on Health and safety committee constituted by staff which meets regularly to review health and safety at the workplace.	51%	38.5%	8.9%	1.6%
5	The employer provides medical and remedial first aid facilities	47.4%	41.7%	7.3%	3.6%
6	There is an emergency response plan on health and safety.	42.7%	45.3%	7.8%	4.2%

Majority of the respondents at 156 (81.2%) stated that the employer enforced health and safety regulations while the least of the respondents at 36 (18.8%) disagree with the majority of the respondents. Preponderance of the respondents at 164 (85.4%) noted that the employer corrected unsafe acts and unsafe conditions in the working environment while the minority of the respondents at 28 (14.6%) stated that the employer did not correct unsafe act and unsafe condition in the working environment. Most of the respondents at 165 (85.9%) noted that the employer ensured that personal protective equipment was available to all staff all the time while the remaining of the respondents at 27 (14.1) were divergent with the majority opinion.

Majority of the respondents at 172 (89.6%) stated that performance on health and safety in their workplace was regularly evaluated while the least among the respondents at 20 (10.4%) disagree with the opinion of the majority respondents. This is in agreement with WASREB, 2015 report that both very large and large utilities have maintained acceptable levels of staff productivity due to water sector reforms under the Water Act 2002. These have seen heavy investments that have since revived formerly dilapidated infrastructure. The introduction of WASREB regulations on performance of utilities by agents could be contributing to the progress. Predominant of the respondents at 171 (89.1%) noted that the employer provided medical and remedial first aid facilities while the remaining respondents at 21 (10.9%) had a divergent opinion from the majority of the respondents. Preponderance of the respondents at 169 (88%) stated that there is an emergency response plan on health and safety in the organization while the few of the respondents at 23 (12%) disagreed with the majority opinion.

Discussion

The socio-demographic data indicates a significant gender imbalance, with 89.1% male respondents compared to 10.9%

female. This disparity may reflect the historical gender dynamics in engineering and technical fields (Kirkup, 2008). Most respondents hold tertiary qualifications (72.4%), suggesting that a well-educated workforce is present, which is crucial for implementing effective OHS practices (Baker & LeTendre, 2011). The duration of employment shows a considerable portion (38%) with 11-15 years of experience, highlighting a stable workforce that may have developed robust safety practices over time (Zohar, 2010). Furthermore, the majority are permanent staff (64.6%), which typically indicates a greater investment in safety training by employers.

As regard Levels of Awareness of Occupational Health and Safety Practices, the high percentage of respondents (90.6%) who received training in OHS practices highlights the importance of training in fostering awareness and compliance (Rundmo, 2000). Additionally, the awareness of the Safety and Health Act of 2007 (90.6%) underscores the legal framework supporting OHS initiatives. This aligns with findings by Zohar (2009), who assert that awareness of regulations enhances compliance and safety culture. The strong agreement on the importance of mastering safety regulations (82.8%) suggests that employees recognize the value of OHS practices, which is crucial for reducing accidents and improving workplace safety (Njuguna, 2007).

With regards to utilization of occupational health safety hazards, a significant majority (82.3%) of respondents indicated regular assessments to identify workplace hazards, suggesting a proactive approach to safety management. This is congruent with the findings of (Hussain et al., 2024) , who argue that regular risk assessments are fundamental for effective OHS. Furthermore, the existence of a health and safety committee (84.4%) points to structured oversight, which is vital for maintaining workplace safety standards (Adewole, et al, 2021). The high percentage of respondents (75%) who believe their employer promotes safety awareness reflects a positive safety climate, which is associated with better safety outcomes (Zohar, 2010).

As regards impacts of occupational health safety management practices, the data reveals that a substantial majority (81.2%) believe their employer enforces OHS regulations, indicating a culture of compliance. This is supported by the findings of (Adewole & Opele, 2019)which show that a strong enforcement culture reduces workplace incidents. The availability of personal protective equipment (85.9%) is critical, as it directly correlates with reducing injury rates (Cohen et al., 2010). The presence of medical facilities (89.6%) further emphasizes the commitment to employee health, aligning with best practices in occupational health management (Gunningham & Sinclair, 2009).

Conclusion

The study on occupational health and safety practices among the staff of the Lower Usuma Dam Water Treatment Plant has

highlighted significant findings regarding employee awareness, training, and the implementation of safety regulations. The high levels of awareness regarding occupational health and safety practices, coupled with the positive perceptions of safety management initiatives, indicate that the organization is fostering a culture of safety. However, the disparity in gender representation and the need for continuous training underscore the necessity for ongoing efforts to enhance safety practices. Ensuring that all employees are well-informed and engaged in health and safety protocols is crucial for reducing workplace hazards and improving overall employee well-being.

Recommendations

Based on the findings, the following recommendations are suggested

1. Regular workshops and training sessions should be conducted to ensure all employees are up-to-date with the latest occupational health and safety practices. This will help reinforce knowledge and skills, promoting a safer work environment in the study area.
2. Efforts should be made to attract more female employees to the organization, particularly in technical roles, to achieve a balanced workforce and diverse perspectives in safety practices.
3. There is a need to establish more robust health and safety committees that include representatives from all levels of staff. This will encourage greater participation in safety discussions and promote a culture of collective responsibility.
4. The management of the agency should conduct periodic assessments to evaluate the effectiveness of safety practices and identify areas for improvement. This will help in maintaining high safety standards and ensuring compliance with regulations.

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