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AN INVESTIGATION ON OCCUPATIONAL SAFETY AND HEALTH COMPLIANCE LEVEL AMONG LABORATORY STAFF OF FEDERAL COLLEGE OF VETERIANRY AND MEDICAL LABORATORY TECHNOLOGY VOM PLATEAU STATE, NIGERIA. (FCVMLT)

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Abstract: This study assessed the level of knowledge of occupational hazards and compliance to safety measures among laboratory professionals in federal college of veterinary medical l laboratory technology Vom. The population for this study comprised thirty questionnaire (30) laboratory workers. A structured questionnaire that was given to the staff of FCVMLT. 83.3% are married, 53.3% agreed that they were given the necessary workplace health and safety training when starting a job, changing jobs or using new techniques, (46.7%). The dominance of male respondents over their female counterparts is due to the fact that male respondents were more accessible and willing to give information as compared to the females, while 43.3% strongly agreed that there are biological and non-biological hazards that is being experienced by Laboratory workers in FCVMLT, (40%) strongly agreed that they have experiences on non-biological hazard, 36.7% agreed that they have experiences on non-biological hazard, (33.3%) agreed that there are risk factors associated with exposure to biological and non-biological hazards among health workers in FCVMLT, (30%) strongly agreed that are complying with the safety laboratory precautions, 26.7% agreed that are complying with the safety laboratory precautions, (23.3%) disagreed about the non-biological hazard, 16.7% are undecided about non-biological hazard, 3.3% strongly disagreed that they are complying with the safety laboratory precautions, and lastly 0.0% strongly disagreed that they have experiences on non-biological hazard. However, it was recommended that all Laboratory staff in institutions and the Ministry of health at all level should work in synergy to design and implement safety training and retraining programmes for laboratory workers.

Keywords: *Investigations, occupations, safety, health, compliance, laboratory.*

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Introduction

The research institution is a model for progress. It combines the human and the machine, the living and the parts, the body and the invention, and it is examined. Additionally, they provide all of the specialized assistance required to make the research facility effective. The work that a logical lab professional typically completes advances current medical and research. The job that allows researchers to concentrate on and carry out the more complex scientific cycles in the lab is completed by a logical lab specialist at the end of the day.

An establishment for scientific research a researcher or technologist differs from an expert in terms of their responsibilities and levels of instruction. Like the expert who merely understands innovation in a practical way and above all, while comparing their instructional levels, a technician will typically hold a Lone Ranger's certification, but a professional would typically hold a lower degree or some other recognized declaration. A professional course will often last for a lengthy time, but a technologist should complete a course that lasts four to five years.

Also, he has a wider range of responsibilities when talking about a technologist's duties. The technologist is the group leader, and his responsibilities include investigating, dissecting, organizing, conducting tests, resolving problems, interpreting and evaluating situations, developing models, and managing the experts. It's also important to note that a technologist bears exclusive responsibility for innovative ideas.

According to Gupta (2010), a hazard is anything that has the potential to harm people, property, and cycles; hence, it can be any behavior, training, or combination of these that can cause harm to people or property. A risk to a research facility can be anything in the laboratory that has the potential to harm people or property. Simply put, a risk is the possibility of any kind of harm occurring (Eyayo, 2014). According to Asuzu (1994), a hazard is any material, procedure, or circumstance that increases the risk of an accident or disease or that causes one. Given that Achalu (2000) found a connection between disease, accidents, and hazards, this cannot be far from the reality. Hazards raise the chance of accidents, which can result in illness and/or disability. The newly discovered illness or impairment may endanger other people (Amanze & Agu 2014). Accordingly, it is a circumstance, state, or item that could endanger the health or safety of employees (Achalu, 2000). that a hazard puts a person or piece of property at risk, and the degree of danger will vary depending on the type of hazard and the degree of exposure.

Occupational hazards according to Onumbu (2008) are workplace or work related dangers, conditions or systems which have the potential to cause stress, injury or loss to the workers, employers or both of them. According to Fasunloro & Owotade (2004), it can also be referred to as any activity, materials, processes, or situation that is likely to result in an accident, injury, or disease at work. An occupational hazard is anything that puts people or property at risk of harm or loss in the workplace while engaging in work related activities. These are setups or conditions in the Laboratory , or anything related to the job that can lead to harm or loss to either the employee or employer, or both of them.

Occupational hazards can be mainly categorized into five (5) namely: ergonomic, physical, chemical, biological and psychosocial hazard (Achalu, 2000 & Eyayo, 2014). Physical hazards include extremes of temperature, noise, vibration, light and radiation. Chemical hazards are particles, fibers, fumes, carbon black, metals and metalloids like mercury and arsenic, organic solvents, like benzene and inorganic gases like carbon monoxide and Sulphur dioxide. Mismatches in posture between humans and machines, lifting heavy objects, performing repetitive manual tasks, and malfunctioning machine parts are all ergonomic risks. Biological hazards are living organisms like bacteria, viruses, fungi and protozoa.

As an old saying goes “knowledge is power”, knowledge which is simply the fact of knowing about something is key in our everyday. Knowledge can come by learning, either from education or experience. Sadly, only a few people understand how critical it is to life. People may have a challenge with knowledge because of what it will cost them to obtain it.

Hazards to laboratory safety and occupational health are a major public health concern in Nigeria. Although they could be decreased or eliminated, prior research has indicated that occupational diseases and injuries among healthcare workers are among the highest of any industry. Human immunodeficiency virus (HIV), hepatitis B, hepatitis C, and other blood-borne infections, back and neck pain, burnout stress, allergic reactions to latex materials, chemical spills, radiation exposure, and patient assault are among the main risks among healthcare workers (HCWs) (Amosu et al., 2011).

The protection of workers from work-related injuries is a priority in the majority of third world (developing) countries, despite the fact that occupational health and safety practices have advanced in the majority of industrialized countries. This is partly because occupational health and safety has been in competition with a number of other health issues (Kumar et al., 2000). Adequate rules and procedures governing the workplace are missing in many developing nations, including Nigeria. Consequently, it exposes the majority of health workers to potentially fatal risks. According to research, just 10% of people in these third-world nations are covered by occupational health and safety regulations, which does not include many significant hazardous occupations and businesses like the medical field (Ahasan and Partanen, 2001; LaDou, 2003). even in settings where safety and workplace health are paramount.

Another difficult problem is that it has been shown that many occupational illnesses or injuries are linked to third-world nations that lack the resources and experience needed to handle them (Ahasan and Partanen, 2001). This is a result of insufficient research, which causes Nigeria and sub-Saharan Africa to underreport occupational health and safety problems. It has also been acknowledged that laboratory personnel in third-world nations are at serious risk from the management of medical waste. For example, improper collecting, sorting, segregation, and disposal of medical waste, including bodily tissues, blood, and sharp medical tools (Patwary et al., 2011). In Nigeria, improper medical waste disposal is a significant problem since it is a major cause of infections and occupational injuries (Patwary et al., 2011).

Materials and Method

This study adopted a descriptive cross-sectional research design to investigate the occupational safety and health compliance level among laboratory staff of the Federal College of Veterinary and Medical Laboratory Technology (FCVMLT), Vom, Plateau State, Nigeria. The research design enabled the collection of both qualitative and quantitative data to assess compliance with occupational safety measures and identify potential hazards in the workplace

Study Area

This study was conducted at the Federal College of Veterinary and Medical Laboratory Technology Vom, Plateau State, Nigeria. (FCVMLT) . It was established in the year 1956 ,it is located in Vwang District Jos south Local Government area of Plateau State. The college is a key institution in training health professional like Medical Laboratory Assistant(MLA) before the introduction of medical laboratory technology (MLT) and in 2014, the institution also introduced national Diploma in environmental health technology (EHT) and in 2022, the brought in Higher National Diploma in Environmental Health Technology, National Diploma in public health technology and National Diploma in Epidemiology and disease control were also introduced , with well-equipped laboratories where practical sessions are conducted. Since the organization is essential to laboratory research and diagnosis, it is the perfect place to evaluate laboratory employees' adherence to occupational safety and health regulations. A unique Federal College of Agriculture, a citadel of learning, and a distinguished institution, it specializes in teaching middle-level personnel in the detection of diseases in both humans and animals. Based on the record of our alumni at several medical and research

facilities throughout the nation and abroad with historic accomplishments, we take pride in being one of the top educational institutions.

Timeframe of the Study

The study was conducted between the periods of January 2024, to April 2024, covering data collection, data analysis and reporting. Due the data collection phase took over four weeks.

Study Participants

Inclusion Criteria

Laboratory scientists working in the Federal College of Veterinary and Medical Laboratory Technology, Vom Plateau State

- Staff who have been employed for at least one year.
- Those who voluntarily consent to participate in the study.

Exclusion Criteria

- Temporary or intern staff.
- Laboratory personnel not directly involved in laboratory activities.
- Those who decline to participate.

Sample Size and Sampling Techniques

The samples sizes consist of 35 respondents which involves only Laboratory Scientist that were selected for the study, out of 35 respondent 30 questionnaire were properly filled and return 5 questionnaire were not properly filled. The sample size will be determined using Cochran formula:

Confidence Level = 95% (Z – Score = 1.96)

Margin of error (e) = 0.05 (5%)

Population proportion (P) = 0.5, since we don't have any prior information)

Response rate of samples sizes (n) = 30
30/35 = 0.8571

$$n = \frac{(Z^2 \times P \times (1-P)}{(e^2 \times 0.8571)}$$

$$n = \frac{(1.96)^2 \times 0.5 (1 - 0.5)}{(0.05)^2 \times 0.8571}$$

$$n = \frac{3.8416 \times 0.25)}{0.0025 \times 0.8571}$$

$$n = \frac{0.9604}{0.002142}$$

n = 30.03
n = 30

The sampling technique involves a stratified random sampling method, where only male and female Laboratory staffs serve as strata. A proportionate random sampling method is then used within each stratum to ensure fair representation of participants from different institutions.

Data Collection Instrument

A well-structured questionnaire and an observational checklist were used for data collection. The questionnaire consists of sections on demographic data, knowledge of occupational safety, safety practices, and compliance levels. The observational checklist was used to assess adherence to safety protocols, the use of personal protective equipment (PPE), and laboratory hazard management practices.

Ethical Considerations

Ethical approval is obtained from the relevant ethics committee before the commencement of the study. Informed consent is sought from all participants, ensuring they understand the purpose, procedures, and confidentiality of their responses. Participation is voluntary, and respondents are assured that their identities remain anonymous.

Data Analysis

The collected data is analyzed using descriptive and inferential statistics. Statistical Package for the Social Sciences (SPSS) software is used for data entry and analysis. Frequency distributions, percentages, are used to describe the data.

Limitations of the Study

The study was limited by the Laboratory staffs of federal College of Veterinary and Medical Laboratory Technology vom plateau state. Additionally, self-reported responses may introduce bias, as participants might provide socially desirable answers. Time constraints and limited access to certain institutional records may also pose challenges in data collection.

Results

Table 4.1: Socio-Economic Characteristics of the Respondents (Public)

Gender	Frequency	Percentage
Male	16	53.3
Female	14	46.7
Total	**30**	**100**
Marital status		
Single	5	16.7
Married	25	83.3
Widow	-	-
Divorce	-	-
Total		**100**
Educational Qualification		
Secondary	-	-

Lab Technician	16	53.3
BMLS	8	26.7
Others	6	20
Total	**30**	**100**
Occupation		
Student	-	-
Trader	-	-
Civil servant	30	100
Total	**30**	**100**

Source: 2024

Table .1 shows the distribution of respondents by age, sex, educational level, and occupation. Gender distribution of respondent's shows that 16 respondent of males represent (53.3%), while 14 respondents of females (46.7%). The dominance of male respondents over their female counterparts is due to the fact that male respondents were more accessible and willing to give information as compared to the females.

The marital pattern of the respondents reveal that 5 respondent represent (16.7%), are single followed by 25 respondent representing (83.3%) are married, While 0 respondent reprenting 0% are widows and 0 respondent representing 0% are divorced accounted. Educationally, about 16 respondent represent (53.3%) have attained medical Laboratory technician, followed by those with secondary qualifications that have 0 respondent represent 0%, BMLS have 8 respondent represent (26.7%) Whereas, others qualifications has 6 respondent represent (20%). The high percentage of those with tertiary educational attainments indicate that respondents in the study area are educated and as such should easily and readily co-operate in achieving a healthy living environment through the dumping of good solid waste management practices. Distribution of respondents by occupation indicated that 0 respondent represent 0% of student, 0 respondent represent 0% traders and 30 respondent represent 100% of civil servants constituted the highest proportion of respondents.

Table 2: Were you given the necessary workplace health and safety training when starting a job, changing jobs or using new techniques?

Options	**Frequency**	**Percentage**
Strongly agreed	11	36.7
Agreed	16	53.3
Undecided	2	6.7
Disagreed	0	0
Strongly disagreed	1	3.3
Total	**30**	**100**

Source: 2024

The tables reveals that 11 respondent represent (36.7%) strongly agreed that the were given the necessary workplace health and safety training when starting a job, changing jobs or using new techniques but 16 respondent represent (53.3%) agreed that the were given the necessary workplace health and safety training when starting a job, changing jobs or using new techniques while 2 respondent represent (6.7%) are undecided, 0 respondent represent (0%) disagreed and lastly 1 respondent represent 3.3% strongly disagreed.

Table 3: Were you given Pre- employment medical examination?

Options	**frequency**	**percentage**
Strongly agreed	6	20
Agreed	6	20
Undecided	5	16.7
Disagreed	13	43.3
Strongly disagreed	0	0.0
Total	**30**	**100**

The tables reveals that 6 respondent represent (20%) strongly agreed that there is Pre- employment medical examination but 6 respondent represent (20%) agreed while 5 respondent represent (16.7%) are undecided, 13 respondent represent (43.3%) disagreed and lastly 0 respondent represent 0.0% strongly disagreed.

Table 4: Are there any biological and non-biological hazards being experienced in your Laboratory?

Options	Frequency	Percentage
Strongly agreed	13	43.3
Agreed	11	36.7
Undecided	6	20
Disagreed	0	0
Strongly disagreed	0	0
Total	**30**	**100**

Sources: 2024

The tables reveals that 13 respondent represent (43.3%) strongly agreed that there is biological and non-biological hazards being experienced by Laboratory workers in FCVMLT but 11 respondent represent (36.7%) agreed while 6 respondent represent (20%) are undecided, 0 respondent represent (0%) disagreed and lastly 0 respondent represent 0.0% strongly disagreed.

Table 5: Are there any risk factors associated with exposure to biological and non-biological hazards in your Laboratory?

Options	frequency	percentage
Strongly agreed	15	50
Agreed	10	33.3
Undecided	5	16.7
Disagreed	0	0.0
Strongly disagreed	0	0.0
Total	**30**	**100**

Source: 2024

The tables reveals that 15 respondent represent (50%) strongly agreed that there is risk factors associated with exposure to biological and non-biological hazards among health workers in FCVMLT but 10 respondent represent (33.3%) agreed while 5 respondent represent (16.7%) are undecided, 0 respondent represent (0%) disagreed and lastly 0 respondent represent 0.0% strongly disagreed.

Table 7: Are you complying with the safety laboratory precautions?

Options	Frequency	Percentage
Strongly agreed	9	30
Agreed	8	26.7
Undecided	5	16.7
Disagreed	7	23.3
Strongly disagreed	1	3.3
Total	**30**	**100**

Sources: 2024

The tables reveals that 9 respondent represent (30%) strongly agreed that are complying with the safety laboratory precautions but 10 respondent represent (33.3%) agreed while 8 respondent represent (26.7%) are undecided, 5 respondent represent (16.7%) disagreed and lastly 1 respondent represent 3.3% strongly disagreed.

Table 8: Do you have any experiences on non-biological hazard?

Options	frequency	percentage
Strongly agreed	12	40
Agreed	11	36.7
Undecided	7	23.3
Disagreed	0	0.0
Strongly disagreed	0	0.0
Total	**30**	**100**

Sources: 2024

The tables reveals that 12 respondent represent (40%) strongly agreed that have any experiences on non-biological hazard but 11 respondent represent (36.7%) agreed while 7 respondent represent (23.3%) are undecided, 0 respondent represent (0.0%) disagreed and lastly 0 respondent represent 0.0% strongly disagreed.

Discussion

The demographic characteristics of the respondents provide critical context for understanding the pervasiveness and management of occupational hazards within the workplace, particularly at FCVMLT. The male supremacy among respondents (53.3%) compared to females (46.7%) bring into line with the notion that males are often more available and open to participating in such studies. The marital status data indicate that the majority (83.3%) are married, which could have insinuations for their attitudes and responsibilities toward workplace safety, as married individuals may display greater concern for long-term health and stability.

Educationally, a important proportion of the respondents (53.3%) have achieved qualifications as medical laboratory technicians, with an additional 26.7% allotment BMLS degrees. This reflects a high level of educational attainment among respondents, supporting the expectation that they should be conversant about workplace safety protocols and hazards, as highlighted by Eyayo (2014). The occupational circulation, where 100% of respondents are civil servants, further underlines the structured nature of the work environment and the potential for institutional influence on safety practices.

The analysis of workplace health and safety training reveals that while a majority (53.3%) agreed and 36.7% strongly agreed that they received necessary training, a small minority (3.3%) strongly disagreed, and 6.7% were undecided. This mixed perception underscores the need for inclusive and reliable workplace health and safety training programs. As Achalu (2000) pointed out, insufficient training increases exposure to risks and hazards, which can lead to accidents and illnesses.

Regarding pre-employment medical examinations, only 20% strongly agreed, and an equivalent proportion agreed, while a notable 43.3% disagreed, indicating a gap in preventive measures. This is reliable with findings from Kumar et al. (2000), who noted the lack of enforcement of occupational health and safety rules in developing countries like Nigeria. Pre-employment examinations are essential for identifying potential vulnerabilities among workers, as suggested by Amosu et al. (2011).

The responses to the presence of biological and non-biological hazards indicate that 43.3% strongly agreed and 36.7% agreed that such hazards exist, validating Gupta's (2010) claim that laboratory environments pose significant risks. Similarly, half of the respondents strongly agreed that there are risk factors associated with exposure to these hazards, with another 33.3% agreeing. This finding aligns with Asuzu's (1994) definition of hazards as factors that predispose individuals to accidents or illnesses.

Submission with laboratory safety precautions presents a more divided outlook, with only 30% strongly agreeing and 33.3% agreeing, while 26.7% were undecided, and a combined 20% either disagreed or strongly disagreed. This indicates room for improvement in adherence to safety protocols, which is essential for mitigating risks, as emphasized by Patwary et al. (2011) regarding the handling of hazardous materials.

Finally, the experience of non-biological hazards, where 40% strongly agreed and 36.7% agreed, reflects significant exposure to these risks. The lack of respondents who disagreed indicates a unanimous acknowledgment of non-biological hazards, supporting the findings of Onumbu (2008) that workplace risks are pervasive and multifaceted.

Overall, the analysis highlights the critical need for strengthened safety training, improved preventive measures like pre-employment medical examinations, and heightened compliance with safety protocols to mitigate the risks associated with occupational hazards in laboratory environments. The discussion aligns with previous research and underscores the importance of addressing gaps in occupational health and safety, particularly in resource-constrained settings

Conclusion

Based on the findings of the study, it was concluded that the Laboratory staff of FCVMLT Vom have the knowledge of occupational safety and health compliance level among themselves in the Laboratory of the Federal College of Veterinary and Medical Laboratory Technology Vom, Jos Plateau State.

- The laboratory staff at Federal College of Veterinary and Medical Laboratory Technology (FCVMLT) prove a high level of awareness regarding occupational safety and health protocols, defiance levels remain moderate. Factors such as inconsistent training, limited

enforcement of safety policies, and individual attitudes toward safety practices influence compliance.

- The study sanctions the presence of both biological and non-biological hazards in the workplace. This includes risks such as exposure to infectious agents, chemical spills, ergonomic issues, and psychosocial stressors. These hazards are well-recognized by the staff, but mitigating measures are not uniformly applied.
- Pre-employment medical examinations and regular health assessments, which are crucial for early documentation of health risks, are inadequately implemented. This shortfall highlights a critical gap in the institution's occupational health and safety framework.
- Although many staff members have received workplace health and safety training, the level of satisfaction with such training varies. The lack of standardized and continuous safety education impacts the staff's ability to consistently adhere to safety protocols.
- The findings underline the need for stronger institutional policies on occupational safety and health. Enhanced regulatory enforcement, combined with regular monitoring and evaluation, can significantly improve compliance levels and reduce risks associated with occupational hazards.

Recommendations

Based on the findings of the study, the following recommendations were made:

- The federal ministry of health should design and implement safety training and retraining programmes for laboratory professionals to sustain the high level of safety compliance found among them.
- The laboratory professionals should also not relent in their effort to get enlightenment on the occupational hazards associated with their job by continuous search for relevant information through different channels, this will make them get acquainted with emerging hazards and how to control them.

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