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Original Research Article

ASSESSING LONE WORKING AND OCCUPATIONAL RISKS IN NIGERIAN PHARMACEUTICAL LABORATORIES

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ABSTRACT

Risks vary with types of tasks carried out in different work places. There have been divergent views as to whether pharmaceutical laboratory workers can be regarded as lone workers often confronted with occupational risks or not. This study focuses on assessing lone working and occupational risks in Nigerian pharmaceutical laboratories. An online Google Form Questionnaire was used for the collation of the responses of the pharmaceutical laboratories workers in the six geo-political zones of Nigeria between April and June, 2024. The data collated were analyzed and the hypotheses tested with standard methods. The demographic information of the respondents with the highest values were: Males (57%); age category of 21-30 years (35%); holders of HND/BSC/BA (70%); married respondents (74%); 0-5 years of working experience (31%); private pharmaceutical (96% while South-West geo-political zone had 44%. The variable, "There are safety policies" had the highest mean of 4.74 when the question on awareness of safety policies in the organization was examined while the variable, "I was given personal protective equipment (PPE) when employed" recorded the highest mean of 4.65 from the responses on the question on trained on safety rules and how to use PPE when employed. However, the highest mean of 3.78 was obtained from the variable, "I perceive risks associated with my job" on the question on the risks associated with working alone whereas the variable, "I enjoy a conducive and friendly work environment" recorded the highest mean of 4.43 on the question on safe working environment and common challenges experienced in working environment. The Pearson Chi-Square asymptotic significance result of 0.732 was obtained when the hypotheses were tested. The findings from the study revealed that pharmaceutical laboratories workers cannot be regarded as lone workers as working in the laboratories involves collaboration which reduces occupational hazards or injuries and minimises errors.

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INTRODUCTION

Globally, different workers in different professions and organizations are confronted with one risk or the other which must be mitigated to ensure that the workers perform maximally with high productivity. Nigerian pharmaceutical sector with over 115 registered pharmaceutical manufacturers like other pharmaceutical sectors all over the world, play a vital benefit in the general wellbeing of the citizens dwelling in the country. This calls for the need to pay serious attention to every issue that has to do with the sector [1].

Pharmaceutical industries have workers in different sections and among the workers are laboratory workers who carry out their assigned tasks either alone or work with others. Working in pharmaceutical laboratories (microbiology and chemical) carries significant risks especially when handling chemicals and reagents that are hazardous and operating equipment that are complex in nature alone but the contributions of these laboratories to guarantee quality, efficacy and safety of drugs cannot be over emphasized [2, 3].

The individuals who work alone without direct or close supervision, including those who are self-employed, are known as lone workers. All over the world, the number of lone workers is increasing every day [4, 5, 6, 7]. Lone workers are basically categorized into 3 groups namely, public-facing lone workers, mobile lone workers and fixed-site lone workers [8]. Johnson *et al.* [9] opined that working alone is associated with risks due to the absence of immediate assistance in case of accidents, health emergencies or equipment failures.

Previous study by Han *et al.* [6] reported that in Canada, USA and EU, there are 53 million workers estimated to be working alone and this accounts for about 15% of the total workforce while 1.3 billion individuals are mobile workers as estimated by the International Data Corporation [10].

In addition, lone workers perform their tasks alone in factories, hospitals, warehouses, truck drivers, shop owners as well as workers in maintenance, agriculture, repair and construction industries [11, 12, 13, 14, 15, 5, 16]. Lone workers are confronted with different types of risky climates and working environments that call for assessment and mitigation. Employers of labour are expected to create a safe working environment with safety policies for workers to perform their duties effectively with less or if possible absence of occupational or mental health disorders [17].

However, no specific rules or safety measures are set for the lone workers [18]. In fact, the safety of the lone workers depends on their perception of risks and

decisions made by them [19]. Possible risks associated with working in pharmaceutical laboratories include exposure to toxic substances, chemical spills or fires, physical injuries from handling equipment and sometimes psychological impacts of working alone [20]. In the same vein, serious consequences can result if there are no effective supporting systems or a delay in responding to critical issues during emergencies in the laboratories [21]. Previous studies focused more on the safety of workers working in groups, but few studies have reported safety of lone workers who are exposed to hazardous situations [12, 22]. Lone workers are categorised to be vulnerable to health risks, which made some countries like UK, Canada and certain regions of Canada to implement guidelines to guarantee their safety by ensuring that they have a safe working environment [23, 24]. Straub [25] reported that lone workers are exposed to different risks, which include sudden illness (e.g. heat stroke and occupational asthma) coupled with occupational injuries (e.g. vehicle collisions, electrocution and assaults).

This study will examine safety policies of the pharmaceutical laboratories in Nigeria with the possibility of proffering mitigating measures to guarantee a safe working environment for pharmaceutical laboratory workers in Nigeria [26]. This study focuses on assessing lone working and occupational risks in Nigerian pharmaceutical laboratories. It is expected that the outcomes of this study will help to address pressing issues confronting manufacturers of drugs, laboratory workers and managers, policy makers in health sector and also provide a conducive working environment for laboratory personnel in the six geo-political zones in Nigeria.

MATERIALS AND METHODS

Study Area

The study area comprises pharmaceutical laboratories (chemical and microbiology) workers in the six geo-political zones of Nigeria (North-Central, North-East, North-West, South-East, South-South and South-West) as shown in Figure 1.

Study Population

The population used for the study was past and present workers in selected pharmaceutical laboratories within the six geo-political zones of Nigeria.

Inclusion Criteria

The pharmaceutical laboratories (chemical and microbiology) past and present workers in the six geo-political zones of Nigeria were used for the study.

Exclusion Criteria

The study did not make use of both past and present non-pharmaceutical laboratories (chemical and microbiology) workers in the six geo-political zones of Nigeria for the study.

Sample Size

The sample size was made up of 23 past and present workers in pharmaceutical laboratories within the six geo-political zones of Nigeria who responded to an online Google Form Questionnaire between April and June 2024.

Data Collection

The data was collected using an online Google Form Questionnaire that was close-ended and well structured. The responses from the online Google Form Questionnaire were collated by 30th of June 2024. The 5-likert scale Strongly Agree (SA) = 5; Agree (A) = 4; Undecided (UD) = 3; Disagree (SD) = 2 and Strongly Disagree (SD) = 1 was used [28]. The online Google Form Questionnaire has demographic information of the respondents and four research questions.

Analysis of Data

The data collated were analysed with descriptive statistics comprising of tables, frequency and percentages [29].

Setting of Cut-off Mean

Equation 1 was used to set the cut-off mean. The acceptance and rejection of a variable was based on the cut-off mean set. A variable with a mean from 3 and above was accepted while the one with less than 3 was rejected.

$$\text{Cut-off mean} = (5+4+3+2+1)/5 = 3 \dots \dots \dots \text{Equation 1}$$

Testing of Research Hypotheses

The Chi Square IBM SPSS version 23 was used to test the hypotheses [29]. The hypotheses tested were as follows:

H_0 = Pharmaceutical laboratories workers are lone workers

H_1 = Pharmaceutical laboratories workers are not lone workers.

RESULTS

Demographic Information of Respondents

The demographic information of the 23 respondents (pharmaceutical laboratories workers) which comprised gender, age category, educational status, marital status, years of experience, workplace and geo-political zone is represented in Figures 2-8. Figure 2 reveals that 57 % of the respondents were males and 43 % were females while in the age category, 21-30 years had the maximum value of 35% and the least value from the age category above 50 years (Figure 3).

Figure 4 shows that holders of HND/BSC/BA with the overall percentage of 70% while the least value was found among the holders of NCE/OND. On the other hand, Figure 5 shows that married respondents with 74% was the greatest while the singles had the least value of 26 %. In addition, the dominant value (31 %) for the years of experience was obtained between 0 and 5 years while the least value (9 %) was obtained between 16 and 20 years (Figure 6). Figure 7 shows that the respondents that worked with private pharmaceutical industries had the predominant value of 96% while the respondents who worked in public pharmaceutical industries had the least value of 4 %. However, respondents from South-West geo-political zone dominated with a value of 44% while the least value of 4% was obtained from North-West and North-Central geo-political zones respectively (Figure 8).

Awareness of Safety Policies in the Organization

The results of the respondents on the awareness of safety policies in the organization are shown in Table 1. The results which revealed the means obtained for each variable ranged from 1.48-4.74. The following variables: There are safety policies; well-trained before using the safety policies; safety policies are reviewed as at when due; the organization punish workers that violate safety policies; I am not aware of the safety policies; are the safety policies in line with the assigned tasks?; safety officers are available in the organization were accepted while there are safety policies but not deployed (2.17); I am aware of the safety policies immediately I was recruited (1.48) and workers were not consulted nor inputs sought before drafting the safety policies (2.87) below the cut-off mark of 3.0 were rejected (Table 1).

However, the highest mean (4.74) was obtained from the variable, there are safety policies while the least mean (1.48) was obtained from, I am aware of the safety policies immediately I was recruited (Table 1).

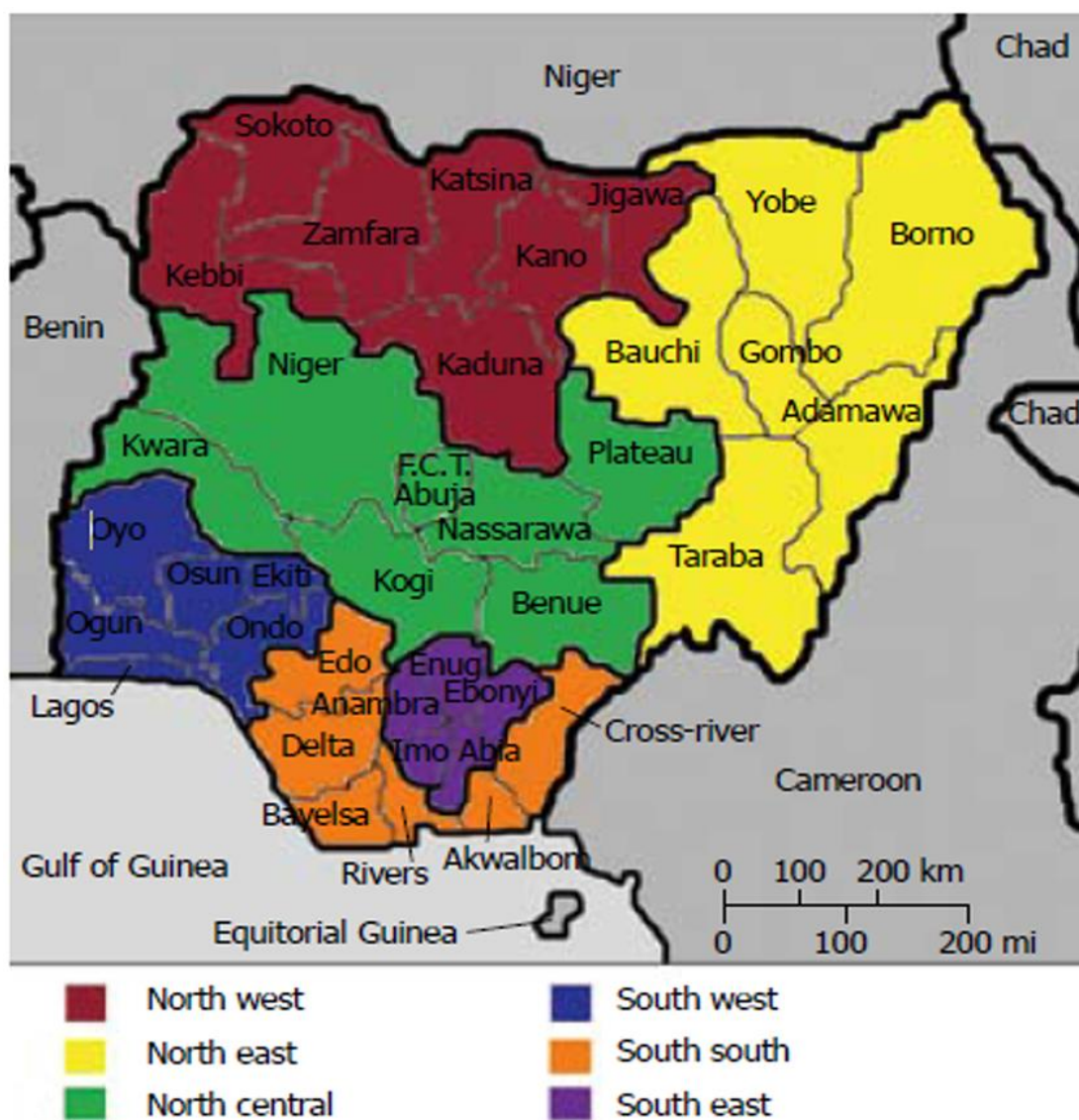


Figure 1: Map of Nigeria Showing the Six Geo-Political Zones [27].

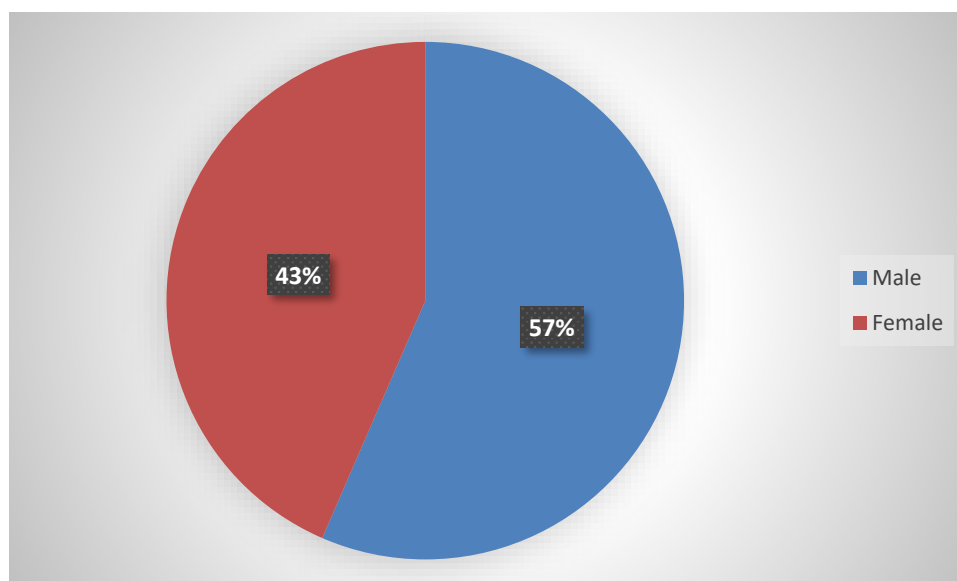


Figure 2: Gender

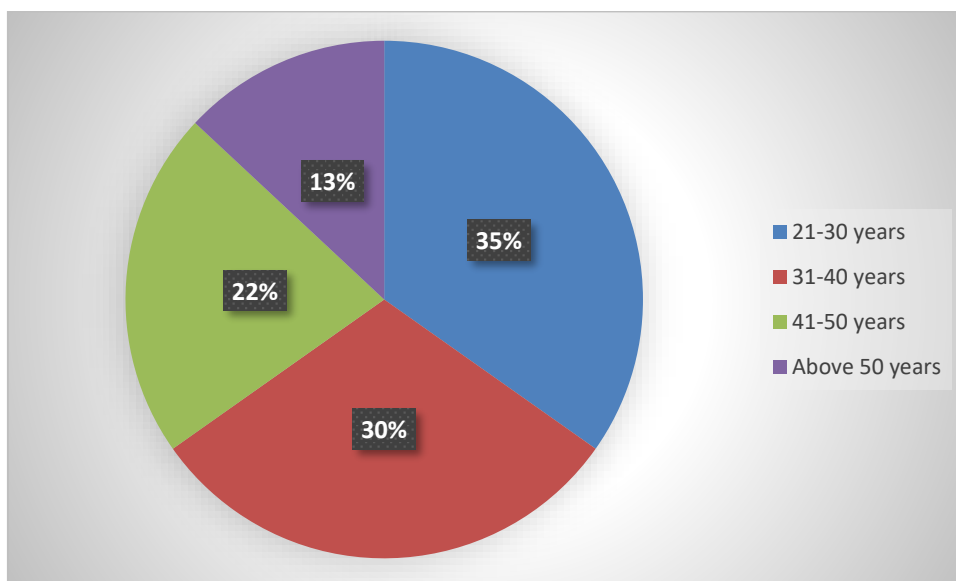


Figure 3: Age Category

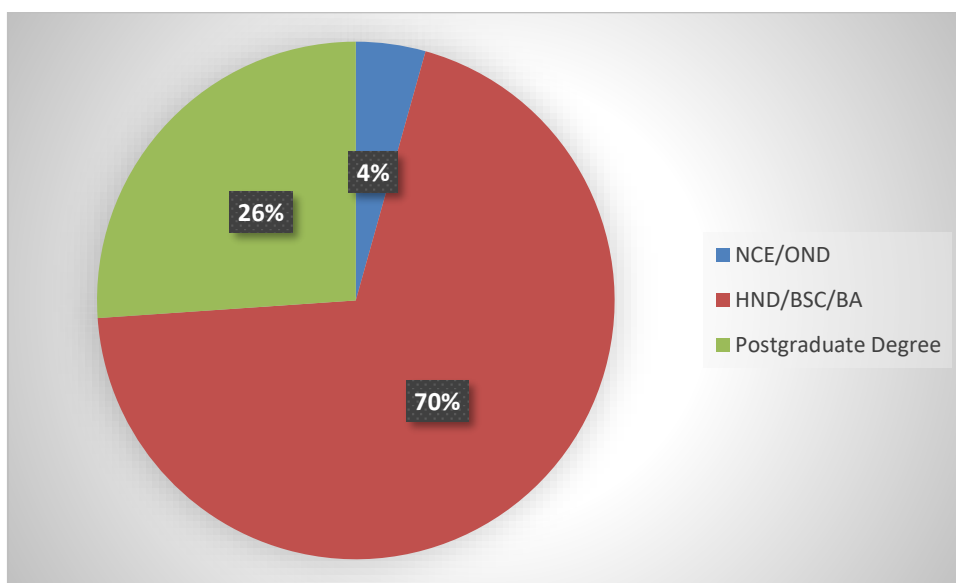


Figure 4: Educational Status

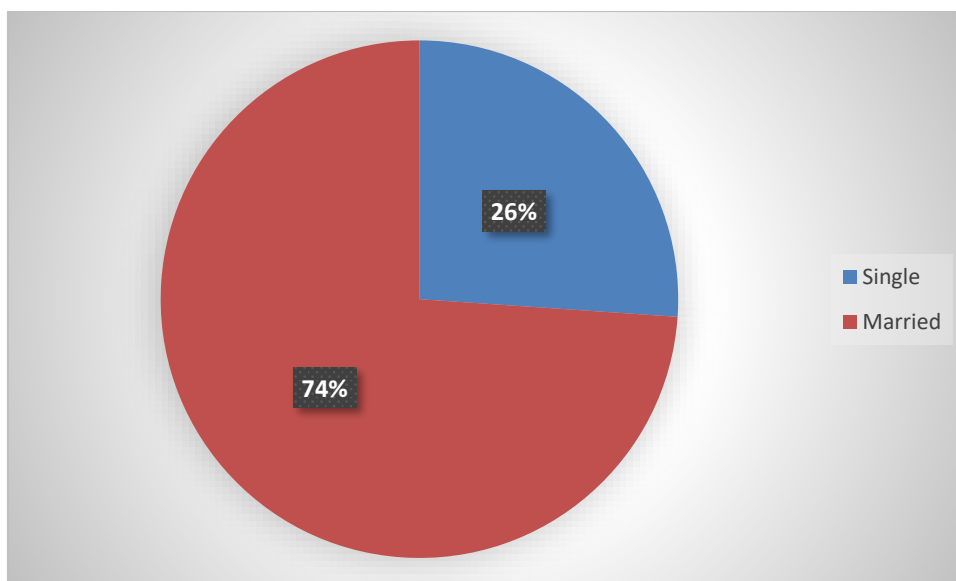


Figure 5: Marital Status

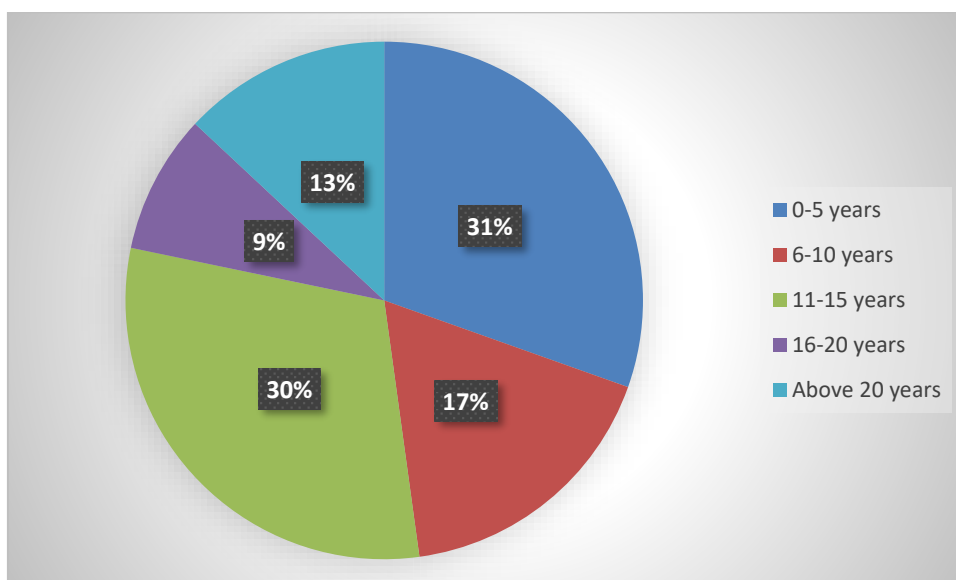


Figure 6: Years of Experience

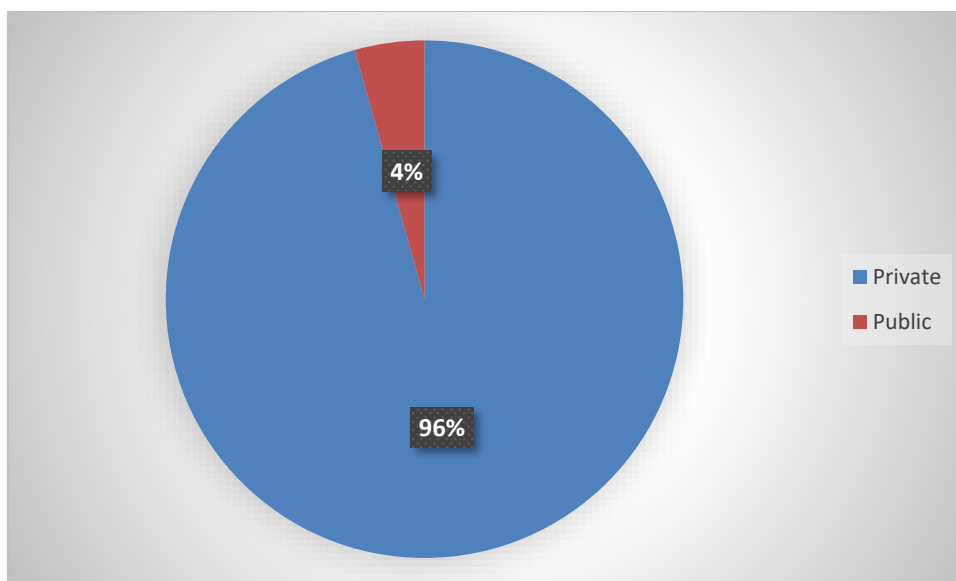


Figure 7: Workplace

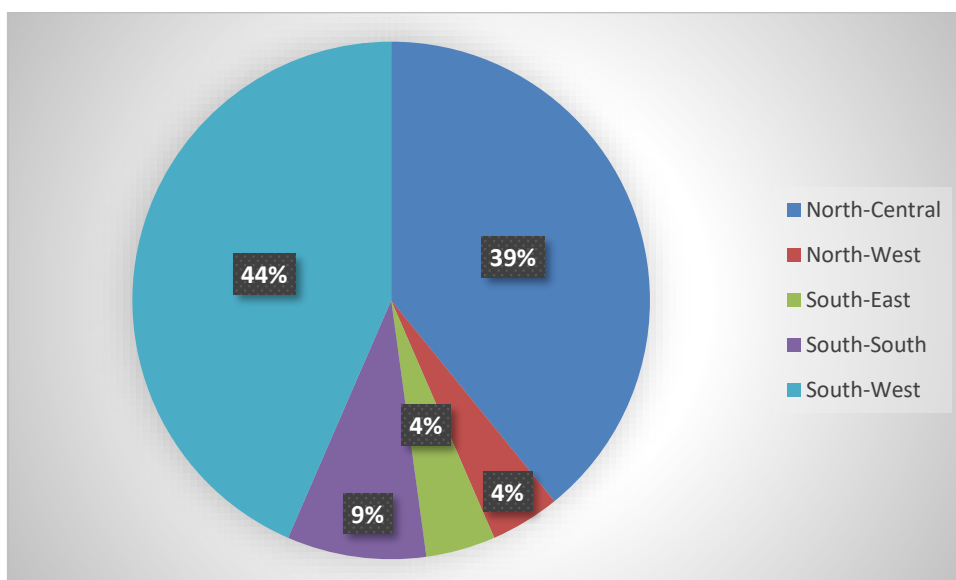


Figure 8: Geo-Political Zone

Table 1: Awareness of Safety Policies in the Organization

SN	VARIABLES	5 SA	4 A	3 UN	2 D	1 SD	Mean	Remark
1	There are safety policies	20	2	0	0	1	4.74	Accepted
2	There are safety policies but not deployed	1	5	0	8	9	2.17	Rejected
3	Well trained before using the safety policies	12	9	0	2	0	4.35	Accepted
4	Safety policies are reviewed as at when due	9	10	0	3	1	4.00	Accepted
5	The organization punish workers that violate safety policies	9	11	1	1	1	4.30	Accepted
6	I am aware of the safety policies immediately I was recruited	11	10	1	0	1	1.48	Rejected
7	I am not aware of the safety policies	0	0	0	11	12	4.71	Accepted
8	Are the safety policies in line with the assigned tasks?	14	9	0	0	0	4.61	Accepted
9	Safety officers are available in the organization	11	4	2	4	2	3.78	Accepted
10	Workers were not consulted nor inputs sought before drafting the safety policies	4	4	5	5	5	2.87	Rejected

Key: SA: Strongly Agree; A: Agree; UN: Undecided; D: Disagree; SD: Strongly Disagree

Table 2: Trained on Safety Rules and How to Use Personal Protective Equipment (PPE) When Employed

SN	VARIABLES	5 SA	4 A	3 UN	2 D	1 SD	Mean	Remark
1	Were you aware that there is a training given on safety?	13	10	0	0	0	4.57	Accepted
2	I was trained on safety behaviour when employed	13	6	3	1	0	4.35	Accepted
3	Safety Officers are available to train workers	11	5	2	4	1	3.91	Accepted
4	The organization is committed to training of workers on safety rules	11	8	2	2	0	4.22	Accepted
5	You are well secured and safe when you work with others	11	11	1	0	0	4.43	Accepted
6	You at your best when you work alone in the laboratory	2	4	2	13	2	2.61	Rejected
7	No training was given on safety rules	0	0	1	10	12	1.52	Rejected
8	I was given personal protective equipment when employed	16	6	1	0	0	4.65	Accepted
9	No training was given to me on how to use personal protective equipment (PPE)	0	0	1	11	11	1.57	Rejected
10	The personal protective equipment given to me is adequate for my assigned duty	11	9	1	2	0	4.26	Accepted
11	PPE was certified okay before given to me	13	5	4	0	1	4.26	Accepted
12	Faulty PPE is changed immediately	7	10	4	1	1	3.91	Accepted

Key: SA: Strongly Agree; A: Agree; UN: Undecided; D: Disagree; SD: Strongly Disagree

Table 3: Risks Associated with Working Alone

SN	VARIABLES	5 SA	4 A	3 UN	2 D	1 SD	Mean	Remark
1	I feel lonely and isolated when I work alone	2	8	3	5	5	2.87	Rejected
2	I am mentally stressed while working alone	2	4	5	9	3	2.70	Rejected
3	I have experienced an occupational hazard while working alone	2	8	2	9	2	2.96	Rejected
4	I often get tired and bored when working alone	2	9	2	7	3	3.00	Accepted
5	Made mistakes sometimes when I worked alone	2	10	1	7	3	3.04	Accepted
6	I perceive risks associated with my job	5	13	2	1	2	3.78	Accepted
7	I do not care whether risks are associated with my job or not	0	0	1	11	11	1.57	Rejected
8	I have sustained injuries while working alone	2	4	2	11	4	2.52	Rejected
9	I have been involved in an accident as a lone worker and nobody to help me	2	2	3	11	5	2.35	Rejected
10	The following risks are also associated with working alone: chemical exposure; electrocution; slips or fall and sudden illness	5	8	6	3	1	3.57	Accepted

Key: SA: Strongly Agree; A: Agree; UN: Undecided; D: Disagree; SD: Strongly Disagree

Table 4: Safe Working Environment and Common Challenges Experienced in Working Environment

SN	VARIABLES	5 SA	4 A	3 UN	2 D	1 SD	Mean	Remark
1	Availability of a conducive and friendly working environment	13	8	1	1	0	4.43	Accepted
2	My organization does a lot to improve the work environment	12	8	3	0	0	4.39	Accepted
3	I enjoy a certain level of autonomy in discharging my duties	5	15	1	2	0	4.00	Accepted
4	My organization organizes routine safety environmental programmes	5	14	1	3	0	3.91	Accepted
5	My laboratory is spacious and comfortable	8	10	2	3	0	4.00	Accepted
6	The procedure to carry out my assigned is not clear	0	0	1	13	9	1.65	Rejected
7	The materials needed for my assigned responsibilities are not provided as at when needed	1	0	2	12	8	1.87	Rejected
8	I have a good and harmonious working relationship with my co-workers during working hours	7	14	2	0	0	4.22	Accepted
9	Professional relationship with my managers	2	11	1	8	1	3.22	Accepted
10	Failure to meet expectations attract criticisms from my manager	4	9	2	6	2	3.30	Accepted
11	Exceeding expectations earn me praise from my manager	9	8	3	3	0	4.00	Accepted
12	Involvement in making decisions by my manager	5	15	1	1	1	3.96	Accepted
13	Friendly relationship with my manager outside work place	5	9	5	4	0	3.65	Accepted
14	My relationship with my co-workers is strictly professional	3	7	3	7	3	3.00	Accepted

Key: SA: Strongly Agree; A: Agree; UN: Undecided; D: Disagree; SD: Strongly Disagree

Table 5: Chi-Square Result for Testing Hypotheses

Parameters	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	144.708 ^a	156	0.732
Likelihood Ratio	79.050	156	1.000
Linear-by-Linear Association	0.405	1	0.525
N of Valid Cases	23		

a. 182 cells (100.0%) have expected count less than 5. The minimum expected count is .04.

Trained in Safety Rules and How to Use Personal Protective Equipment (PPE) When Employed

Table 2 shows the results for training on safety rules and how to use personal protective equipment (PPE) when the laboratory workers were employed. The results showed that the range of the mean obtained was between 1.52 and 4.65. Variables such as: Were you aware that there is a training given on safety?; I was trained on safety behaviour when employed; safety officers are available to train workers; the organization is committed to training of workers on safety rules; you are well secured and safe when you work with others; I was given PPE when employed; the PPE given to me is adequate for my assigned duty; PPE was certified okay before given to me and faulty PPE is changed immediately were accepted. On the other hand, you at your best when you work alone in the laboratory (2.61); no training was given on safety rules (1.52) and no training was given to me on how to use PPE (1.57) that were below the cut-off mark of 3.0 were rejected (Table 2).

Meanwhile, the highest means of 4.65 was obtained from the variable, I was given PPE when employed while no training was given on safety rules had the least value of 1.52 (Table 2).

Risks Associated with Working Alone

Table 3 shows the results of risks associated with working alone. The mean values of 1.57 - 3.78 were obtained when the variables were examined. The following variables: I often get tired and bored when working alone; made mistakes sometimes when I worked alone; I perceive risks associated with my job and the following risks are also associated with working alone: chemical exposure, electrocution, slips or fall and sudden illness which were above the cut-off mark (3.0 and above) were accepted whereas variables such as: I feel lonely and isolated when I work alone (2.87); I am mentally stressed while working alone (2.70); I have experienced an occupational hazard while working alone (2.96); I do not care whether risks are associated with my job or not (1.57); I have sustained injuries while working alone (2.52) and I have been involved in an accident as a lone worker and nobody to help me (2.35) were rejected because the mean values obtained were below the cut-off mark of 3.0 (Table 3).

However, the highest mean of 3.78 was obtained from the variable, I perceives risks associated with my job while I do not care whether risks are associated with my job or not had the least mean (1.57) (Table 3).

Safe Working Environment and Common Challenges Experienced in Working Environment

The findings for the responses to a safe working environment and common challenges experienced in working environment are shown in Table 4. The range for the mean values obtained was between 1.65 and 4.43. Only the variables such as: The procedure to carry out my assigned is not clear (1.65) and the materials needed for my assigned responsibilities are not provided as at when needed (1.87) were rejected as the mean

values obtained were below the cut-off mark of 3.0 but others were accepted because they had values from 3 and above (Table 4).

However, availability of a conducive and friendly working environment had the maximum mean of 4.43 while the least mean of 1.65 was obtained from, the procedure to carry out my assigned is not clear (Table 4).

Hypotheses

The hypotheses namely: Pharmaceutical laboratories workers are lone workers (H_0) and pharmaceutical laboratories workers are not lone workers (H_1) were tested. The Pearson Chi-Square asymptotic significance result of 0.732 was obtained for the 23 valid cases analyzed and it was higher than p-value of 0.05 (Table 5).

DISCUSSION

The results of demographic information (Gender, age category, educational status, marital status, years of experience, workplace and geo-political zones) obtained from the 23 respondents revealed the relationship between the demographic information and working in pharmaceutical laboratories from the six geo-political zones of Nigeria. The highest percentage obtained from the males over the females is similar with the previous studies that showed higher percentage in males [30, 31, 32]. Similar results were obtained from previous studies in developing countries as a result of the norms, cultures and the expectations of the society which possibly favoured this result [33]. Meanwhile, the result disagrees with previous findings that recorded higher percentages in females due to workforce policies [34, 35].

The report of NBS [36] which show that the highest percentage of Nigerian workforce fell below 35 years align with the result obtained from the respondents between age 21 and 30 years in this study. In the same vein, previous study by Adeyemi and Salami [37] which indicated that pharmaceutical industries in Nigeria are made up of vibrant and skilful young graduates and the report by Mehta *et al.* [38] which revealed that India and Brazil workforce are made up of young workers supported this work whereas this is not the case in North America, UK and Germany where workforce with respect to age is well balanced [39, 40]. In fact, for efficiency, timely delivery of services, speedy industrialization and creativity, young workers are needed in high proportion than the elderly ones in the pharmaceutical industries [38, 41] which further support the outcome of this study.

Furthermore, the outcome of the educational status which favoured the holders of HND/BSc/BA agree with the regulatory requirements for quality control personnel and other principal personnel in pharmaceutical industries for efficiency and timely service delivery [42]. One of the factors that enhances the stability and sustainability of pharmaceutical industries is when employees are married as this facilitates stability in their careers [43]. Thus, the highest percentage obtained among the married respondents agrees with these findings and conform

to the work of Kumar *et al.* [44] where married workers were higher than the singles. However, previous studies by Johnson *et al.* [45] where the workforce are more of the singles caused by delay in marriages, variations and diverse culture in USA and Europe not in agreement with the findings from this study. In addition, previous study by Olatunji *et al.* [46] which showed that years of experience in pharmaceutical industries fell between 0 and 5 years is consistent with the findings in this study while similar results were also recorded in India and Brazil [38]. The highest percentage recorded for the years of experience between 0 and 5 years in pharmaceutical industries may possibly be due to poor organizational policies which do not encourage workers spending more years unlike Germany and other developed countries with productive and result-oriented policies [40]. The findings with respect to respondents' workplace which favoured private pharmaceutical industries agree with the previous findings by Umar and Salami [47] and Bello *et al.* [48] who reported that the pharmaceutical sector in Nigeria is dominated by private stakeholders due to poor and insufficient funding by the government. The same occurrence of private sector having upper hand in pharmaceutical industries in Asia and USA agree with the outcomes of this study [34] unlike the UK where pharmaceutical sector is highly driven by the public sector and the public laboratories at the forefront of research and developments [49]. The highest percentage recorded in the private sector may possibly be connected to availability of favourable infrastructures, privileges and opportunities for career development coupled with good salaries paid to the workers [50, 51].

The South-West having the highest percentage of pharmaceutical industries agree with the past studies by Adeola *et al.* [52] that indicated the highest concentration of pharmaceutical industries in the South-West of Nigeria which also favoured rapid development of industries. This same unequal distribution also played out in Mexico [53] whereas a well distributed pharmaceutical personnel and industries are obtainable in developed countries as a result of decentralization and favourable policies [54]. Meanwhile, there is a need for the government of the day to invest in infrastructural development in all the six geo-political zones of Nigeria to prevent further lopsidedness of the pharmaceutical industries in the future.

More so, the highest mean obtained from the variable that says, "There are safety policies" is supported by the previous findings by Reddy *et al.* [55]; Onyekuru *et al.* [56] and Olusola *et al.* [57] which revealed that many workers in pharmaceutical industries are quite aware of safety policies in order to safeguard their wellbeing, safety and prevent occupational hazards. The previous reports agree with the results obtained from "Workers well trained before using safety policies and safety policies reviewed as at when due" which guarantee the safety of workers in pharmaceutical sector [58, 59, 60, 61, 62]. However, variables such as "I am aware of the safety policies immediately I was recruited and workers were not consulted nor inputs sought before drafting the safety policies" which were rejected revealed the gaps in the pharmaceutical sector and also implicative because workers perception of risks and

involvement in drafting safety policies are vital in risks mitigation as posited by Inegbedion *et al.* [63], Adebayo *et al.* [64] and Uzoechi *et al.* [65]. Therefore, the need for regular interaction and synergy between the workers and employers will ensure safety not only in the laboratories but in organization [66].

The highest mean score recorded from the variable, "I was given personal protective equipment (PPE) when employed" with other acceptable variables such as "Availability of safety officers to train workers"; "Trained on safety behaviour and PPE given is adequate for the assigned duty" are in agreement with the policies by Occupational Safety and Health Administration (OSHA) in the United States and the European agency for Safety and Health at Work (EU-OSHA) in the European Union to ensure training and safety of workers in workplaces [67, 68]. Meanwhile, rejected variable, "No training was given on safety rules" revealed the missing links (such as inadequacy of training given or no training at all) in the pharmaceutical laboratories which ought not to be so. Therefore, it is imperative for pharmaceutical workers to be adequately trained on the rules that guide their safety so as to mitigate any potential hazards or injuries in the laboratories.

The "Perception of risks associated with my job" which recorded the highest mean when working in the laboratory implied that the workers have strong awareness of the risks associated with their jobs and by following the safety protocols in the laboratory coupled with good supervision with respect to associated risks (such as chemical exposure, electrocution; slips or fall and sudden illness) will serve as mitigating measures [69]. The following risks (such as chemical exposure, electrocution; slips or fall and sudden illness) which were accepted by respondents while working alone in the laboratory align with the previous findings [70, 71]. This implies that the pharmaceutical laboratories must put in place safety protocols, provision of PPEs which workers must strictly complied with in order to conform to global practice and to prevent occupational hazards and risks [71]. However, variables such as "Loneliness and isolation" and "Mental stress" which normally are associated with lone working were rejected and this may be due to differences in the tasks carried out in the laboratories and working policies put in place coupled with organizational differences [72].

The variable, "I enjoy a conducive and friendly work environment" that had the highest mean value when variables on safe working environment and common challenges experienced in working environment were examined agree with the global practice which enhance workers' retention, effective communication, conducive organizational climate, mutual trust and respect, safety, mental well-being, reduction in occupational injuries and hazards leading to higher productivity of the workers [73, 74, 75]. In addition, the variables, "I enjoy a certain level of autonomy in discharging my duties" and "I have a good and harmonious working relationship with my co-workers during working hours" align with the global practice. This leads to job satisfaction, productivity, creativity, inter-personal relationships, reduction

in accidents and timely completion of assigned tasks [71, 73, 76].

However, the result obtained after the hypotheses were tested was higher than the p-value which favoured the alternate hypothesis. This showed that working in pharmaceutical laboratories in the six geo-political zones of Nigeria cannot be regarded as lone working. Previous studies which reported that working in the laboratories involve collaboration and teamwork which reduces occupational hazards or injuries and minimizes errors agree with this outcome [37, 77, 78].

CONCLUSION

The outcomes from the study showed that working in the pharmaceutical laboratories is not a lone working because working in the pharmaceutical laboratories involve collaboration and teamwork which reduces occupational hazards or injuries and minimize errors.

AUTHORS' CONTRIBUTION

OSD, AJE, BP, and AME contributed to the conception, design of the questionnaire, and drafting of the manuscript. **AOS** analyzed the data and interpreted the results. All authors contributed immensely to the revision of the manuscript for intellectual content and approved the final draft for publication.

CONFLICT OF INTEREST

No conflicts of interest by the authors.

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