SOCIO DEMOGRAPHIC FACTORS ASSOCIATED WITH ~~KNOWLEDGE OF~~ OCCUPATIONAL HAZARD ~~AND SAFETY MEASURES~~ AMONG WORKERS ~~IN SELECTED DOWNSTREAM PETROLEUM COMPANIES~~ IN PORT HARCOURT, RIVERS STATE, NIGERIA.

ABSTRACT

Background: Safety and health management are some of the vital constituents of oil and gas industry activities, because most of the operational conditions, chemicals and end products associated with oil and gas production are well-known to pose serious safety and health threats to the workers. However, these hazards can be prevented and controlled with good safety practices. This study aims to investigate the knowledge, attitude and practices of workers in the downstream petroleum companies about occupational hazards and safety processes.

Materials and Method: The study ~~was~~ is a descriptive cross-sectional study which ~~involved~~ involves a quantitative approach to collect data from 379 technical workers engaged in operations in the selected downstream petroleum companies, sampled via multi-stage sampling technique. A semi-structured interviewer-administered questionnaire was used to collect relevant information. Data was analysed via Statistical Package for Social Science (SPSS) version 20 software.

Result: Almost one-third 120 (32.0%) of the respondents were between the ages of 38-43years old. Majority 343 (91.0%) were males, while most 277 (73.0%) were single. Majority 363 (95.8%) had good ~~Level~~ level of knowledge on occupational ~~Hazard~~hazard, while 359 (94.7%) of the respondents had good ~~Level~~ level of knowledge on safety measure on occupational hazard. More than one-third 139 (36.70%) had positive behaviour towards preventive measures for occupational hazard, while 167 (44%) had good practice towards ~~Safety~~ safety measures for occupational hazard. Level of knowledge on occupational hazard was significantly associated with age, sex and religion ($p<0.05$).

Conclusion: Though most of the respondents were knowledgeable about occupational hazard and safety measures, positive behaviour towards safety measure and its practice was low among workers in the downstream petroleum companies. Hence, the need for behavioural interventional programmes directed at ensuring positive occupational safety related behaviour among workers generally and those in industrial settings particularly

Keywords: Downstream, Petroleum, Hazard, Safety and Nigeria.

1.0 INTRODUCTION

With the oil and gas industry growing each year in Nigeria, the need for workers in this ~~field~~ area is also ~~on the increase~~increasing. Oil and gas well drilling and servicing activities involve many different types of equipment and materials which may expose workers to hazards emanating from activities related to their jobs. Hazard is defined as the presence of a material or condition that has the potential for causing loss or harm. Occupational hazard thus, refers to work-related risk to the health of a person usually arising out of employment and is usually the result of unsafe work conditions and behaviours. Occupational hazards may arise from three dimensions: the task to be done, for instance malfunctioning machines, lack of protective equipment like working conditions which arise from inadequate lighting, fatigue that comes out of excessive working hours and the employee himself/herself. Other possible causes of occupational hazards include bad roads leading to well sites, lack firm shoulders and other safety features, presence of highly combustible hydrocarbons, presence of oxygen/ignition source, frequent need to work at heights~~elevations~~, uneven surface, improper use or non-availability of fall protection systems among others.[1]

Safety and health management are some of the vital constituents of oil and gas industry activities, because most of the operational conditions, chemicals and end products (hydrocarbons and other compounds) associated with oil and gas production are well-known to pose serious safety and health threats to the workers. The number of work-related fatalities in the oil and gas industry globally stands at 27.6%, with a total of 1,189 deaths annually.[2] According to Meswani, [3] 4,000 ~~out~~ of every 100, 000 workers die as a result of fatal occupational injuries. Over the last few years, multinational oil and gas producing companies in Nigeria have continued to report accidents and sometimes death of crew members.

Thus, the magnitude of the global impact of occupational hazards, as well as major industrial disasters, has been a long-standing source of concern at the international, national, and workplace level. Despite the huge gains accrued to the discovery of oil, cases of hazard related effects, like pollution and workplace accidents linked to evolution of petroleum refining and other subsidiary processes are increasingly being reported at an alarming rate. The inflammable nature of the petroleum products, exposures to high sophisticated machineries and equipment,

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heavy metal toxicity, environmental health hazards and other injurious effects opens the workers to a high risk and work related accidents[3]. The researcher is bothered about this situation and is moved to ask the following questions: could it be that the workers in petroleum producing companies do not have knowledge of occupational hazards? To what extent do workers practice safety measures in workplace? These unanswered questions underscore the problem issue of this study.

There is the a need to continue to reduce exposure to hazards, while maintaining existing companies as well as developing new oil and gas facilities in an economic climate, as we haveis the case in Nigeria, and reducing the risk acceptance of hazards in the society. To combat the hazards associated with processes of the petroleum companies, understanding the knowledge of workers regarding the hazards peculiar to their job and the safety measures crucial to preventing the occurrence of occupational hazard is important. The need to develop effective frameworks that will initiate the integration and ensure implementation of safety measures in oil and gas facilities in Nigeria is evident. Where these exist, there is a need to promote adherence to these practice guidelines. Given the foregoing, this study is set out to establish the knowledge, attitude and practices on occupational hazards and safety processes of workers in downstream petroleum companies in Port Harcourt, Rivers State.

2.0 METHOD

2.1 Study Area

This study was carried out in selected downstream petroleum companies in Port Harcourt, Rivers State. The city was established in 1912 by the British (unclear to me) and named after Lewis Vernon Harcourt. The urban population is about 2.7 million people. Port Harcourt is the capital and largest city of Rivers State, Nigeria. Port Harcourt is a flat river-port city located along the Bonny River in the Niger Delta, approximately 50 km from the sea. As of 2016, the Port Harcourt urban area has an estimated population of 1,865,000 inhabitants, up from 1,382,592 as inof 2006. The city of Port Harcourt takes pride in being the Gulf of Guinea's oil and gas activity hub. This prominence is due to its strategic location in the Niger Delta as the Nigerian and West African sub-region petroleum industry's operational headquarters. Port Harcourt holds the largest accumulation of heavy and light industry technology in Nigeria and the West African sub-region.

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~~The economy of Port Harcourt is vibrant and offers myriad opportunities for business, investment, and tourism. There is also significant horticultural activity within the metropolitan area. This has earned Port Harcourt the appellation, "*The Garden City*".~~ Port Harcourt's oil and gas industry is centered in its main industrial area, Trans Amadi, where most of the international oil companies and service providers have their headquarters and operational bases. Port Harcourt's downstream oil business is represented by two refineries and a petrochemical plant.

~~Port Harcourt is well endowed with all the infrastructure of a modern city international and domestic airports, seaports, hotels, and conference facilities. The Port Harcourt International Airport is located in Omagwa, about 30 minutes' drive from the city center. Port Harcourt is connected to the world and the rest of Nigeria with a vast array of airlines that fly to Paris, Frankfurt, Lagos, and Abuja.~~ Two seaports are located in Port Harcourt the Federal Ocean Terminal, located in Onne, and the Port Harcourt Wharf. The oil and gas free zone is located in Onne, which was created to offer duty-free import services and is the main route for most goods imported to support energy sector activities.

2.2 Study Design

A descriptive cross sectional study was employed to collect data from workers in downstream petroleum companies in Port Harcourt, Rivers State, and assess their knowledge, attitude and practices on occupational hazards and safety processes.

2.3 Study Population

This study was conducted among all technical workers engaged in operations ~~within~~ between the ages ~~range~~ of 20 ≥ and 50 ~~years~~, both ~~males~~ men and women~~females~~. A sample of this population was studied. The total number of workers in the selected downstream petroleum companies ~~is~~ was 420 (Downstream Petroleum Companies in Port Harcourt, 2018).

2.3.1 Inclusion Criteria

All employees who have worked for a minimum of one year in the selected downstream petroleum companies were taken in this study, with assumption that those who have worked for less than one year have not formed or adopted basic occupational habits. (Grammar!)

2.3.2 Exclusion Criteria

Employees who did not report for duty on the selected days of questionnaire administration were excluded.

2.4 Sample Size Determination

The sample size was calculated using ~~(4)~~the formula recommended by Daniel; [4] the following assumptions were adopted; proportion of workers (using estimated prevalence of 27.6% [= 0.28]). Using 5% margin of error at 95% confidence level, the sample size was 379 after considering 10% non-response rate.

2.5 Sampling Method

A multi staged sampling method was used for this study.

First, simple random sampling technique was used to select the study respondents.

Step One: A list of functional oil and gas downstream companies was obtained from the Directorate of Petroleum Resources (DPR) of the Nigerian National Petroleum Corporation (NNPC) office in Port Harcourt. A total of 10 companies was made, which included: Conoil, Chibeco Oil and Gas Nigeria Limited, Forte Oil Plc, MRS Oil Nigeria Plc, Romans Petroleum Resources Limited, Oando Group, Ciscon Nigeria Limited, Master energy Nigeria Limited, Nexpro Group as well as Lewis Oil and Gas.

Step Two: Three o~~ut~~f the group were selected by a simple random method in order to satisfy the minimum sample size and to broaden ~~to~~ the scope of the study.

The list of ~~the~~ companies ~~constituted~~ was the sampling framework from which three were selected. ~~–~~ The selection was done through balloting. The serial numbers of the companies were written out on pieces of papers, wrapped and put in a cup. Three wraps were then picked out from the cup, while being blindfolded with a handkerchief. The companies selected were: Oando, Con Oil and Agip.

Step Three: The proportionate sampling method to the size of each of the selected companies was used to allocate the minimum sample required to each of the selected companies. The staff strength of all technical staff, involved in exploration/production activities was obtained from the

Human Resources Department of each of the companies. The following formula was used to calculate the sample size for each of the companies:

TSn/TSN*379,

Where:

TSn = Technical Staff strength of selected company

TSN= Total Technical Staff Strength of all 3 selected companies

TSN= Total Technical Staff Strength of all 3 selected companies = 1158

Oando = TSn = 414

Con Oil = TSn = 346

Agip = TSn = 398

Applying the formula TSn/TSN*379;

Oando = TSn/TSN*379 = 414/1158*379 = 136

Con Oil = TSn/TSN*379 = 346/1158*379 =113

Agip = TSn/TSN*379 = 398/1158*379 = 130

2.6 Study Instrument

A semi-structured self administered questionnaire on the knowledge, attitude and practices on occupational hazards and safety practices in Oil and Gas facilities was used in the study. The Questionnaire comprises of six sections: A. B, C, D, E and F.

SECTION A obtained items on the socio-demographic characteristics of the respondents.

SECTION B obtained items on the occupational history of the respondents.

SECTION C obtained the typed of hazards encountered.

SECTION D obtained knowledge of occupational hazards

The questionnaire was validated by pre-testing it in a small survey of 26 respondents in Juhel Nigeria Limited and Jezco oil company Enugu. However, the data from the pre-test did not form part of the study.

2.7 Data Collection Procedure

Data collection was done over a period of eight (8) alternate work days during the morning hours. The purpose of the study was explained to the eligible respondents. With the assistance of the Department/Unit Foremen and Supervisors, the study questionnaires were distributed to all

eligible technical staff who reported for duty on the days of the study was carried out. The questionnaires were self-administered. All duly completed questionnaires were retrieved on the spot and cross-cheeked for completeness. The researcher employed the services of a research assistant in administering the questionnaire to assist in the data collection. -A total number of 391 questionnaires were distributed to the workers but 379 (97%) of them were returned completed.

2.8 Data Analysis

Data collected from the field was cross checked and cleaned and entered into the Microsoft Excel spreadsheet from where it was exported to Statistical Package for Social Sciences (SPSS) software version 22 for analysis. The data was analyzed using Statistical Package for Socioal Sciences (SPSS) version 23. Descriptive statistics were conducted to describe the background characteristics of the respondents The analysis involved the calculation of descriptive statistics (such as frequency distributions, percentages and means and median) to describe the background characteristics of the respondents and inferential statistics (logistic regression). Continuous variables were expressed as means ± standard deviation while categorical variables were expressed as absolute frequencies. The p-value of less than 0.05 was considered statistically significant. Results from analyzed data were presented in tables and charts.

2.9 Ethical Clearance

Ethical clearance for the study was obtained from the Ethics Committee of University of Port Harcourt. Permission to conduct the study was obtained from the management of the participating companies, and consent was obtained from all participants after explaining the purpose of the study and requesting that they willingly participate in the study. The workers were also informed that their participation will not affect their job as utmost confidentiality would be maintained. They were informed that they were free to choose not to participate in the study.

3.0 Limitations

Recall bias; some respondents found it difficult to recall answers to some of the questions in the questionnaire.

3.0 RESULTS

A total number of 391 questionnaires were distributed to workers in the selected downstream petroleum companies, but 379 (97%) of them were returned completed.

Table 1: Socio-demographic ~~Characteristics~~ characteristics of the ~~Respondents~~ respondents

Variable	Category	Frequency (n=379)	Percentage (%)
Sex	Male	343	91.0
	Female	36	9.00
Age (years)	20-25	8	2.0
	26-31	68	18.0
	32-37	106	28.0
	38-43	120	32.0
	44-49	65	17.0
	50 and above	12	3.0
Marital status	Single ‘	277	73.0
	Married	102	27.0
Religion	Christianity	364	96.0
	Islam	15	4.0
Length of service in ~~in~~ the company (yrs)	2-6	72	19.0
	7-11	166	44.0
	12-16	118	31.0
	17-21	23	6.0
Highest educational attainment	Primary	12	3.00
	Secondary	96	25.0
	Tertiary	110	29.0
	Technical education	161	43.0
Type of employment	Regular	124	33.0
	Casual	255	67.0
Eth~~i~~nicity	Igbo	156	41.1

Ikwerre	81	21.4
Yoruba	80	21.1
Kalabari	53	13.9
Hausa	9	2.3

Table 1 showed that majority, 343 (91.0%) of the respondents were males; 120 (32.0%) were aged 32-37 years; 277 (73.0%) were single; 364 (96.0%) were Christians; 166 (44.0%) have served in the downstream petroleum companies for a period of 7-11 years and 255 (67.0%) were casual workers. One hundred and fifty-six (41.1%) were of the Igbo origin while 9 (2.3%) were of Hausa origin. ~~-~~ The table revealed that the majority of the respondents were males, aged 32-37 years, ~~were~~ single, practiced Christianity, and have served in the downstream petroleum companies for a period of 7-11, being ~~and were~~ casual workers.

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Table 2: Knowledge of ~~Occupational Hazards~~ occupational hazards among ~~Respondents~~respondents

Variable	Category	Frequency (n=379)	Percentage (%)
Ever heard of occupational hazard	Yes	375	99.0
	No	4	1.00
Source of information (n=375)	Television	11	3.00
	Radio station	12	3.20
	During safety training at work	345	92.0
	Posters	7	1.80
Identified job hazards	Struck by/caught-in/caught between	28	7.00
	Vehicle accident	46	12.0
	Falls	238	63.0
	Chemical exposure	67	18.0
Knowledge of exposure to job hazard	Yes	366	97.0
	No	13	3.00
Types of hazards exposed to (n=366)	Struck by/caught-in/caught between	27	7.00

	Vehicle accident	44	12.0
	Falls	230	63.0
	Chemical exposure	12	18.0
Witness any occupational health hazards	Yes	332	88.0
	No	15	4.00
	I don't know	32	8.00
Knowledge job of oil and gas workers predisposition to falls	Yes	358	94.0
	No	21	6.00
Knowledge that confined spaces constitute hazards	Yes	346	91.0
	No	25	7.00
	I don't know	8	2.00
Knowledge that slippery surfaces exposes to occupational hazard	Yes	358	94.0
	No	21	6.00
Does the absence of personal protective equipment lead to the occurrence of occupational hazard for oil and gas workers?	Yes	371	98.0
	No	8	2.00
Knowledge that poor lighting conditions can lead to occupational hazards	Yes	375	99.0
	No	4	1.00
Knowledge that not using full body harness when climbing heights above the ground can lead to the occurrence	Yes	371	98.0
	No	8	2.00
Knowledge that ~~nott~~not having enough working space can lead to the occurrence of occupational hazard	Yes	332	88.0
	No	15	4.00
	I don't know	32	8.00
Knowledge that the misuse of operational equipment may result in occupational hazards	Yes	366	97.0
	No	13	3.00

T~~he t~~able 2 above shows that a significant proportion of workers in downstream petroleum companies are knowledgeable about occupational hazards. Out of the 379 respondents studied, 375 (99.0%) have heard of occupational hazard while 4 (1.00%) have not. 28 (7.00%) identified such hazards to include struck by/caught-in/caught between, 46 (12.0%) vehicle accident, 238 (63.0%) falls and 67 (18.0%) chemical exposure.

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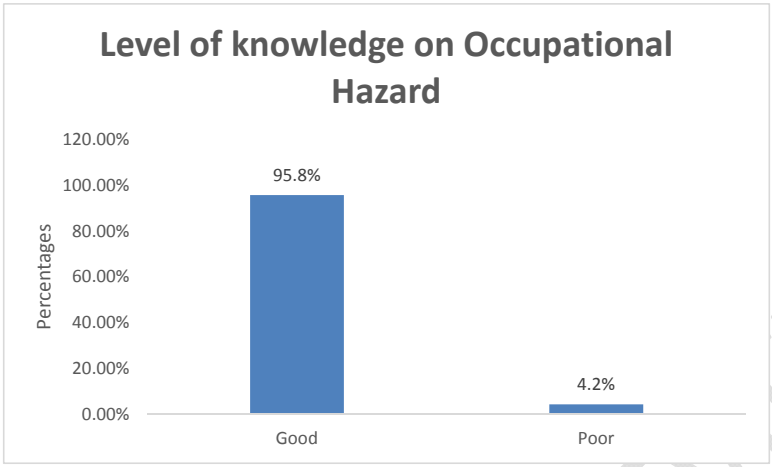

Fig 1: Level of knowledge on ~~Occupational~~ occupational ~~Hazard~~hazard

~~The f~~Fig 1 above shows that out of the 379 respondents interviewed, 363 (95.8%) had good ~~Level~~ level of knowledge on ~~Occupational~~ occupational ~~Hazard~~hazard.

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Table 3: Knowledge of ~~Safety~~ safety ~~Measures~~ measures for ~~Occupational~~ occupational ~~Hazards~~ hazards among ~~Respondents~~ respondents

Variable	Category	Frequency (n=379)	Percentage (%)
Knowledge that elimination of source of hazards is a safety measure.	Yes	358	94.0
	No	21	6.0
Knowledge that the use of less hazardous chemicals or piece of equipment help offer protection against occupational hazards	Yes	346	91.0
	No	25	7.0
	Don't know	8	2.0
Knowledge that the removal of a hazard or placing a barrier between the worker and the hazard serve as a safety measure	Yes	375	99.0
	No	4	1.00
Knowledge that PPE is an effective safety	Yes	371	98.0

measures for occupational hazards	No	8	2.00
Knowledge that unsafe procedures or situations be reported	Yes	358	94.0
	No	21	6.00
Knowledge that monitoring ~~ones~~one's own health and safety status is good	Yes	346	91.0
	No	25	7.00
	I don't know	8	2.00
Knowledge that the company has a medical clinic	Yes	375	99.0
	No	4	1.00

Table 3 above showed that majority of workers in the downstream petroleum companies have knowledge of safety measures for occupational hazards. The following safety measures were identified: elimination of source of hazard (94.0%), use of less hazardous chemicals or piece of equipment (91.0%), removal of a hazard or placing a barrier between the worker and the hazard (99.0%), use of personal protective equipment (98.0%), reporting unsafe procedures or situations (94.0%), workers' ~~self-monitoring~~self-monitoring of their health and safety status (91.0%), establishment of medical clinics in workplaces (99.0%).

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Table 4: Knowledge of ~~Safety~~ safety ~~Measures~~ measures for ~~Occupational~~ occupational ~~Hazards~~ hazards among ~~Respondents~~ respondents

Variable	Category	Frequency (n=379)	Percentage (%)
~~Did~~ Had medical examination at recruitment	Yes	371	98.0
	No	8	2.00
Knowledge that pre-placement medical examination is usually done before any task	Yes	332	88.0
	No	15	4.00
	I don't know	32	8.00
Is medical exam carried out periodically?	Yes	332	88.0
	No	15	4.00
	I don't know	32	8.00

If yes. How regularly are the exams performed?	Quarterly	-	-
	Bi annually	10	3.00
	Annually	332	97.0
	Once in a while	379	100

Table 4 showed that medical examination at recruitment (98.0%) and medical examination before job placement (88.0%).

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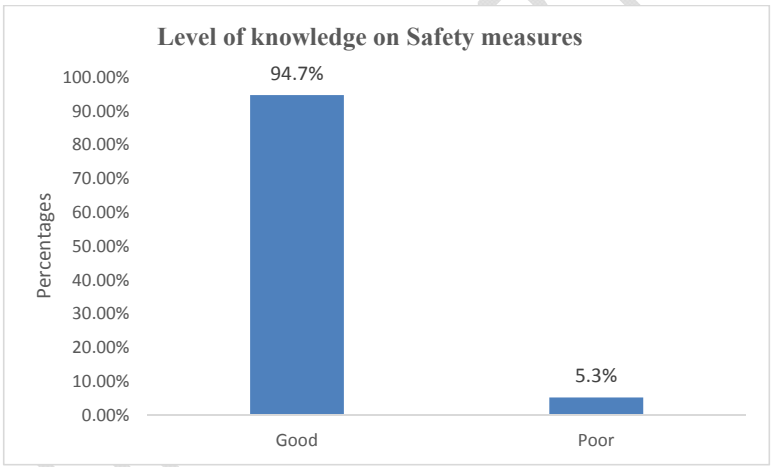

Fig 2: Level of knowledge on safety measure on Occupational Hazard

~~The f~~Fig 2 above shows that out of the 379 respondents interviewed, 359 (94.7%) had good ~~Level~~ level of knowledge on safety measure on ~~Occupational~~ occupational ~~Hazard~~hazard.

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Table 5: Association between ~~Socio~~ socio ~~Demographics~~ demographics and level of knowledge on ~~Occupational~~ occupational ~~Hazard~~hazard

Variable	Level of knowledge on Occupational Hazard			df	χ2 (p-value)	OR (95% CI)
	Good (%)	Poor (%)	Total (%)			
Age						
≤31years	72 (19.8)	16 (100)	88 (23.2)		0.000*[f]	*Not applicable*
>31years	291 (80.2)	0 (0)	291 (76.8)	1		
Total	363(100)	16(100)	379(100)			
Sex						
Male	334(92.0)	9(56.3)	343(90.5)		22.798	8.95
				1	(0.000)*	(3.10-25.80)
Female	29(8.0)	7(43.8)	36(9.5)			
Total	363(100)	16(100)	379(100)			
Marital status						
Single	263(72.5)	14(87.5)	277(73.1)		0.254[f]	0.37
				1		(0.84-1.68)
Married	100(27.5)	2(12.5)	102(26.9)			

Total	363(100)	16(100)	379(100)			
Religion						
Christianity	351(96.7)	13(81.3)	364(96.0)		0.021*	6.75
				1		(1.69-26.85)
Islam	12(3.3)	3(18.8)	15(4.0)			
Total	363(100)	16(100)	379(100)			

*F= fischers exact test, * =statistically significant (<0.05)*

~~In the table~~ Table 5 above shows that there was no statistically significant association observed between marital status and ~~Level~~ level of knowledge on ~~Occupational~~ occupational hazard. However, there was a statistically significant association observed between sex and the level of knowledge on ~~Occupational~~ occupational hazard, ~~those who were~~the males had significant higher proportion (92%) ~~towards~~ of people having good level of knowledge on ~~Occupational~~ occupational hazard compared to ~~those who were~~the females (8%). The~~ose who were~~ males ~~are~~ were 8.95 times more at odds in having good level of knowledge on ~~Occupational~~ occupational hazard compared to ~~those who were~~ females.

A statistically significant association was observed between age and level of knowledge on ~~Occupational~~ occupational ~~hazard,~~hazard; those over 31 years ~~who were >31 years~~ of age had significant higher proportion (80.2%) towards having good level of knowledge on ~~Occupational~~ occupational hazard compared to those ~~who were ≤~~below 31years (19.8%).

A statistically significant association was observed between religion and level of knowledge on ~~Occupational~~ occupational ~~hazard,~~hazard; those who were Christians had significant higher proportion (96.7%) towards having good level of knowledge on ~~Occupational~~ occupational hazard compared to those who were of Islam faith (3.3%). Those who were Christians ~~are~~ were 6.75 times more at odds in having good level of knowledge on ~~Occupational~~ occupational hazard compared to those who were Islam.

Table 6: Association between ~~Socio~~ socio ~~Demographics~~ demographics and level of knowledge on ~~Occupational~~ occupational ~~Hazard~~ hazard ~~Cont'~~cont'

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Variable	Level of knowledge on Occupational Hazard			df	χ2 (p-value)	OR (95% CI)
	Good (%)	Poor (%)	Total (%)			
Educational level of completed ***(Merged)***						
Primary/Secondary	102(28.1)	6(37.5)	108(28.5)	1	0.665 (0.415)	0.65 (0.23-1.83)
Tertiary/Technical College	261(71.9)	10(62.5)	271(71.5)			
Total	363(100)	16(100)	379(100)			
Type of Employment						
Regular	117(32.2)	7(43.8)	124(32.7)	1	0.924 (0.337)	0.61 (0.22-1.68)
Casual	246(67.8)	9(56.3)	255(67.3)			
Number of years worked						
≤11	226(62.3)	12(75.0)	238(62.8)	1	0.430[f]	0.55 (0.17-1.74)
>11	137(37.7)	4(25.0)	141(37.2)			
Total	363(100)	16(100)	379(100)			

[f]= *fischers exact test, * =statistically significant (<0.05)*

~~In t~~Table 6 above shows that there was no statistically significant association observed between ~~Education~~education, ~~Type~~ type of ~~Employment~~ employment and ~~Numbers~~ numbers of years worked ~~with~~ and the ~~L~~level of knowledge on ~~Occupational~~ occupational hazard.

Table 7: Association between ~~Socio~~ socio ~~Demographics~~ demographics and level of knowledge on ~~Safety~~ safety ~~————~~measures

Variable	Level of knowledge on safety measures on Occupational Hazard			Df	χ2 (p-value)	OR (95% CI)
	Good (%)	Poor (%)	Total (%)			
Age						
≤31years	72(20.7)	4(20.0)	88(23.2)	1	0.936[f]	1.047 (0.34-3.22)
>31years	275(79.3)	16(80.0)	291(76.8)			

Total	347(100)	20(100)	379(100)			
Sex						
Male	325(92.0)	18(90.0)	343(90.5)	1	0.938[f]	1.062 (0.23-4.772
Female	34(9.5)	2(10)	36(9.5)			
Total	359(100)	20(100)	379(100)			
Marital status						
Single	262(73.0)	15(75.0)	277(73.1)	1	0.842[f]	0.90 (0.32-2.54)
Married	97(27.0)	5(25.0)	102(26.9)			
Total	359(100)	20(100)	379(100)			
Religion						
Christianity	345(96.1)	19(95.0)	364(96.0)	1	0.564[F]	1.29 (0.16-10.38)
Islam	14(3.9)	1(5.0)	15(4.0)			
Total						

[f]= fischers exact test, * =statistically significant (<0.05)

In ~~the t~~Table 7 above it is ~~shows~~ shown that there was no statistically significant association observed between ~~Age~~age, ~~Sex~~sex, ~~Marital~~ marital status and ~~Religion~~ religion ~~with~~ and the ~~Level~~ level of knowledge on safety measures of o~~O~~ccupational ~~Hazard~~hazard.

Table 8: Association between ~~Socio~~ socio ~~Demographics~~ demographics and level of knowledge on ~~Safety~~ safety ~~_____~~measures

Variable	Level of knowledge on safety measures			Df	χ2 (p-value)	OR (95% CI)
	Good (%)	Poor (%)	Total (%)			
Educational level of completed ***(Merged)***						
Primary/Secondary	103(28.7)	5(25.0)	108(28.5)	1	0.127 (0.722)	1.20 (0.42-3.40)
Tertiary/Technical College	256(71.3)	15(75.0)	271(71.5)			
Total	359(100)	20(100)	379(100)			
Type of Employment						
Regular	118(32.9)	6(30.0)	124(32.7)	1	0.071 (0.790)	1.14 0.42-3.04)
Casual	241(67.1)	14(70.)	255(67.3)			
Total	359(100)	20(100)	379(100)			
Number of years worked						
≤11	225(62.7)	13(65.0)	238(62.8)	1	0.044 (0.833)	0.90 (0.35-2.32)
>11	134(37.3)	7(35.0)	141(37.2)			
Total	359(100)	20(100)	379(100)			

*F= fischers exact test, * =statistically significant (<0.05)*

In ~~table~~ Table 8 above it is ~~shows~~ shown that there ~~was~~ is no statistically significant association observed between ~~Education~~education, ~~Type~~ type of ~~Employment~~ employment and ~~Numbers~~ numbers of years worked ~~with~~ and the ~~Level~~ level of knowledge on ~~Occupational~~ occupational hazard ~~Occupational Hazard~~.

4.0 DISCUSSION

A study by Umar and Ibrahim [5] revealed that no association was found between the knowledge of occupational risks and hazards and gender of the participants (p>0.05).[5] The study indicated that more than a quarter of the workers were exposed to high occupational risks and hazards irrespective of their gender. Similarly, the present study shows that there was no statistically significant association observed between marital status and ~~Level~~ the level of knowledge on

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~~Occupational~~ occupational hazard. Also, this study found that a statistically significant association between sex and level of knowledge on ~~Occupational~~ occupational hazard, and those who were males had significant higher proportion (92%) towards having good level of knowledge on ~~Occupational~~ occupational hazard compared to those who were females (8%). Thus, th~~ose who were~~ e males are 8.95 times more at odds in having good level of knowledge on ~~Occupational~~ occupational hazard compared to those who were females. The present study is affirmed a study by Sabitu *et al.* [6] which have found that the awareness of occupational hazards was positively influenced by educational attainment, age, nature of training and work experience, and there was no significant difference in the respondents' knowledge of occupational hazards based on gender.

According to a study by Kwankye[7], the findings showed that gender does not play significant role in ensuring compliance to occupational health and safety. [8] ~~in~~ In their study, they found that variables which had significant influence on the occupational health problems were knowledge on occupational health hazard (p=0.016), work experience (p=0.021), health ~~checkup~~check-up (p=0.042) and for the occupational health injuries were monthly income (p=0.036), knowledge to prevent from health risk (p=0.001), gender (p=0.02), and knowledge of occupational health hazard (p=0.011), work experience (p= 0.025), work type (p=0.001), knowledge on PPEs (p=0.034) and knowledge on work-related health risks(p= 0.027). Findings in the previous study carried out by Marahatta *et al.*, [8] ~~is~~ are not similar with those in the present study which revealed no statistically significant association between ~~Education~~education, ~~Type~~ type of ~~Employment~~ employment and ~~Numbers~~ numbers of years worked with the l~~L~~evel of knowledge on ~~Occupational~~ occupational hazard ~~Occupational Hazard~~. According to a study by Baksh *et al.*, [9] ~~results showed that~~the farmers had overall good knowledge, fairly positive attitudes but strong negative perceptions towards occupational health and safety issues in agriculture. However, gender was not a significant factor on knowledge, attitude or perception levels in the study. Additionally, the attitude varied significantly based on characteristics of farmers (age and job type) and communication efforts by extension. Findings by Egenti and Azuike [10] showed that there was no statistically significant association between age and knowledge regarding occupational hazards. There was no statistically significant association between age and knowledge regarding safety measures. According to a study carried out by Amabye, [11] ~~showed that~~ significant association was found between occupational risks and hazards exposure and age

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(p≤0.05). ~~Also~~In addition, a study by Thepaksorn et al. ([12]) revealed that practice of safety measures for occupational hearing problems was inversely correlated with age. This is similar to another study by Rotifa and Eguvbe, ([13]) which showed that age and duration of employment ~~was~~ did not statistically significant influence ~~of~~ the knowledge of occupational hazards and safety measures among workers. Similarly, this present study revealed that there was no statistically significant association between ~~Age~~age, ~~Sex~~sex, ~~Marital~~ marital status and ~~Religion~~ religion ~~with~~ and the ~~Level~~ level of knowledge on safety measures ~~Occupational~~ of occupational ~~Hazard~~hazard.

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5.0 CONCLUSION

~~The researchers made the following conclusions based~~ Based on the findings in the study,~~: that was~~ there is no~~a~~ statistically significant association between sex and the level of knowledge on ~~Occupational~~ occupational hazard. ~~The researchers found that~~In addition, there ~~was~~ is no statistically significant association observed between socio demographic ~~characteristics such~~characteristics such as, ~~Age~~age, ~~Sex~~sex, ~~Marital~~ marital status and ~~Religion~~ religion ~~with~~ and the l~~L~~evel of knowledge on safety measures ~~Occupational~~ of occupational ~~Hazard , and no~~ hazard. No statistically significant association was observed between ~~Education~~education, ~~Type~~ type of ~~Employment~~ employment and ~~Numbers~~ numbers of years worked ~~with~~ and the ~~Level~~ level of knowledge on ~~Occupational~~ the occupational hazard~~ Occupational Hazard~~. T~~hus, t~~he ~~researchers conclude that~~ most of the respondents were knowledgeable about occupational hazard and safety measures, positive behaviour towards safety measure and (its practice was low among workers) unclear!!! in the downstream petroleum companies. Hence the need for behavioural interventional programmes directed at ensuring positive occupational safety related behaviour among workers generally and those in industrial settings particularly.

Conflict of Interest

The authors declared that they have no conflicts of interest.

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