THE INTERNATIONAL JOURNAL OF SCIENCE & TECHNOLEDGE

Knowledge, Attitude and Practices Regarding Occupational Hazards and Safety Measures among Oil and Gas Workers in South-South Nigeria

Aminaho, Efenwengbe Nicholas
Graduate Student, Department of Petroleum Engineering,
University of Aberdeen, UK
Aminaho, Ehianu Maynard
Data Analyst, Minapress Research Institute, Port Harcourt, Nigeria
Aminaho Mariam
Graduate Student, Department of Educational Management,
University of Port Harcourt, Nigeria

Abstract:
This study investigated the knowledge, attitude and practices regarding occupational hazards and safety measures among oil and gas workers in South-South Nigeria. The study objectives were to determine the knowledge of petroleum companies' workers about occupational hazards and safety measures, establish their attitude towards safety measures for occupational hazards and ascertain whether workers in petroleum companies actually practice hazard prevention in the workplace. The study adopted cross sectional design and a total of 7200 oil and gas workers formed the target population. A sample of 379 oil and gas workers was selected using the stratified non proportionate sampling technique. Structured questionnaire was used as the data collection instrument. Analysis of data was done using Microsoft Excel and Statistical Package for Social Sciences (SPSS) software. Results revealed that a large proportion of oil and gas workers though knowledgeable about occupational hazards and safety measures do not actually practice workplace hazard prevention. A significant proportion of the oil and gas workers were negative in their attitudes towards safety measures in the workplace. However age and length of service significantly influenced the knowledge of safety measures for occupational hazards ($P<0.05$). Based on the study findings, the need for petroleum companies to design and implement behavioural change programmes in addition to their routine safety trainings with the aim of stimulating workers to take responsibility for their health and safety in the workplace is crucial.

Keywords: *Knowledge, attitude, practices, occupational hazards, south-south Nigeria*

1. Introduction

Oil and gas companies in Nigeria have continued to in recent times report accidents and deaths among workers in the sector. The increasing number of health and safety issues associated with oil and gas operations with the harmful consequences of the employees in the upstream and downstream petroleum industry in Nigeria has become a major source of concern to petroleum companies, individuals and groups in the society. Occupational hazards are workplace-related inimical physical, psychosocial, ergonomic, chemical, biologic and environmental factors to which individuals and groups within an occupation may be exposed. Within the petroleum industry, oil and gas operations are associated with actual and potential hazards which oftentimes emanate from poor use of working equipment, the nature of working environment, the knowledge of employees on the operational mechanisms and procedures for each task as well as unwholesome safety behaviours and practices (Wipro, 2017). Hence, work-place related hazards and condition places employees at risk for problems that could compromise their physical, mental, social and overall well being. Occupational hazards could have adverse consequences on the health of the individuals, impair workers functionality and may result in death depending the nature of hazard and the extent of damage done.

Thus, the consequences of occupational hazards include actual and potential exposure injury and vulnerability to environment-borne health problems with negative impact on significant other individuals. Occupational hazard exposure is not something that happens acutely. There are usually warning and quality control signs relating to instrumental fractures, working condition surveillance, work-space design, specific job responsibilities and incidence outbreak in any industry operations including oil and gas operations. Such warning sign may include but not limited to biological agents (viral and bacterial disease causing agents), chemical exposure, physical violence or attacks on employees and reports of ergonomic conditions by workers among others. Hazards to which workers are exposed could have immediate, degenerative or progressive harmful consequences (for example asbestos exposure which could predispose to occupational cancers (International Labour Organization, 2015).

According to Osagbemi, La-Kadri and Aderibigbe (2010), overall job plan could predispose individuals and groups to occupational injuries of lifetime nature, where hazard prevention, control and work-place safety protocols are not followed. Studies on workplace hazards reveal that variations in the knowledge and attitude of oil and gas workers towards occupational hazards and safety precautions. Akalonu, Nwaogazie and Ejikeme (2017) conducted a study which revealed high awareness regarding occupational hazards and safety measures among employees in petroleum industry and however, recommended attitudinal change as a way of reducing the incidence of injuries, illnesses and fatalities in the workplace. Adebola (2014) found out that majority oil and gas workers despite having appreciable knowledge of occupational hazards and preventive strategies do not comply with global best practices relating to oil and gas operations in all petroleum sectors.Inyang (2007) while appraising the job-related health and safety practices of worker in the oil and gas industry asserted that a large proportion of oil and gas workers do not significantly implement safety protocols, a situation which exerts harmful effects on the employees and the organizations.

On the occupational difference in the knowledge, attitude and practice of preventive measures for occupational hazards among workers in the oil and gas sector, the socio-demographic variables of gender, age, work type and length of work experience did not significantly influence how knowledgeable the workers were, their behaviour towards safety measures and the actual practice of health and safety (Kwankye, 2012; Baksh, Wayne & Narine, 2015; Umar & Ibrahim , 2015; Egenti & Azuike, 2017; Marahatta, Katuwl, Adhikari & Rijal, 2017). Recommendations on the ways of reducing the prevalence of occupational hazards include the use of safety equipments, compliance with universal safety precautionary measures, hazard surveillance, periodic risk assessment practices and routine fit-to-use equipment evaluation of workers among others (Umar & Ibrahim, 2015). This trends and turn of events in the oil and gas industry suggests that safety is the answer.

Safety measures as regards hazards are prevention and control protocols for injuries, damages and harmful workplace exposure. Potential safety issues or problems in the oil and gas industries could be averted by taking prioritized safety measures. According to NIOSH (2017), the common safety measures in order of priority include elimination (entire and deliberate taking away of the hazards), substitution (replacing high risk with less hazardous one), engineering control (placement of restraints that are physical in nature on the hazards), administrative/institutional strategies (ensuring compliance by designing and implementing administrative adherence policies) and ultimately use of Personal Protective Equipment (PPE) In other words, the occupational hazard prevention principles include risk avoidance, risk assessment, risk source identification and mitigation, fitting the job to the employee, workers adaptation to the work routines and progress on technical stance, replacement of hazardous with non or less inimical work factors, policy formulation and implementation on operational safety in line with global best practices, prioritizing protective measures and practices in the work place and employee training (NIOSH, 2017). Therefore, occupational hazards can be prevented if relevant protective measures are taken (Meswani, 2017).

However, inspite of the gains known to be derivable from prevention and control of hazard in organization, a global report by Meswani (2017) reveals that approximately 2.9 billion employees are potentially and actually exposed to hazards in their workplaces. Corroboratively, Kalejaiye (2013) reported a yearly death rate of 1,249 per 100,000 employeesin Nigeria in the past decade. One can therefore infer that the relevance of occupational safety seems ignored by government and regulating agencies globally, nationally and regionally. Occupational injuries and accidents oftentimes results in disabilities among employees which could in turn lead to loss of manpower with associated decline in job output, economic gallops and in severe cases physical death.

Few oil and gas companies in Nigeria, particularly multinationals place so much relevance on occupational safety, social responsibility and employee well-being. However, reports of non compliance to safety protocols among oil and gas employees abound. Considering the ample emphasis that has been placed on occupational hazards and the need for effective practice of safety measures, one is moved to question the knowledge and attitude of employees towards occupational hazards and safety measures in the oil and gas industry in Nigeria as knowledge and behaviours towards operational policies are believed to influence practices of such protocols. Could it be that the employees in the oil and gas sector in Nigeria are not knowledgeable on what constitutes occupational hazards? Do oil and gas workers have appreciable knowledge of safety measures for occupational hazards? What is the attitude of workers in petroleum companies towards occupational hazards and related safety measures? To what extent do oil and gas workers practice safety measures for occupational hazards are there socio-demographic variations in the knowledge, attitude and practice of occupational hazards and safety measures among employees in petroleum companies? The bid to answer these crucial questions formed the basis for this study.

2. Materials and Method

This study adopted cross sectional survey as its design and a cross section of employees in the oil and gas industry in South-South Nigeria participated in the study. South-South region is one of the geopolitical zones in Nigeria which is made up of six (6) states (Akwa Ibom, Bayelsa, Cross Rivers, Delta, Edo and Rivers). South-South Nigeria is the fiscal giant of Nigeria as the major oil and gas operations that fuel the development of the country takes place in the region. The region houses the various sectors of petroleum industry.

A total of 7200 oil and gas employees formed the study population out of which 379 were selected using the stratified non proportionate sampling technique. Sample size determination was done using Taro Yamane's formula. The instrument for data collection was a structured questionnaire. Reliability of the data collection tool was done using Cronbach Alpha method and a score of 0.78 was obtained which proved the instrument reliable enough for the study. Due ethical clearance was obtained from the oil and gas companies used in the study, the purpose of the study was also

explained to the employees who willingly participated in the study.Data analysis was done using Microsoft Excel and the SPSS Software. Results were presented in tables to allow for better appreciation of findings.

3. Results and Discussion

3.1. Results

Variable	Category	Frequency (n=379)	Percentage (%)
Sex	Male	331	87.3
	Female	48	12.7
	Total	379	100
Age (years)	20-25	8	2.10
	26-31	68	17.9
	32-37	104	24.7
	38-43	119	31.4
	44-49	68	17.9
	50 and above	12	3.20
	Total	379	100
Marital status	Single '	280	73.9
	Married	99	26.1
	Total	379	100
Religion	Christianity	364	96.0
	Islam	15	4.00
	Total	379	100
Type of employment	Regular	113	29.8
	Casual	266	70.2
	Total	379	100

Table 1: Socio-Demographic Characteristics of the Respondents (Field Survey, 2018)

Table 1 showed that majority of the respondents were males; mean age was 34±2 with majority aged 32-37 years, were single, practiced Christianity and were casual workers.

S/N	Items	Frequency (n=379)	Percentage (%)
1	Have you heard of occupational hazard?		
	Yes	374	98.7
	No	5	1.30
	Total	379	100
2	Are you aware of occupational hazard exposure in your line of duty?		
	Yes	322	85.0
	No	57	15.0
	Total	379	100
3	Are you aware of the types of hazards you may be exposed to while working?		
	Yes	315	83.1
	No	64	16.9
	Total	379	100
4	Broken objects and sharp equipments are physical hazards?		
	Yes	371	98.0
	No	8	2.00
	Total	379	100
5	Misuse of operational equipments may result in hazards for me?		
	Yes	332	88.0
	No	15	8.00
	Total	379	100

Table 2: Knowledge of Occupational Hazards among Respondents

Scores	Knowledge	Frequency	Percentage
1-2	Poor	10	2.00
3-4	Moderate	31	8.00
5-6	Good	338	90.0
	Total	379	100

Table 3: Categorization of Respondents' Knowledge of Occupational Hazards (N=379)
(Field Survey, 2018)

Tables 2 and 3 show that 2.00% had poor knowledge, 8.00% had moderate knowledge while 90.0% had good knowledge of occupational hazards.

S/N	Items	Frequency (n=379)	Percentage (%)
1	Is elimination of source of hazards a safety measure in the Oil and Gas industry?		
	Yes	358	94.0
	No	21	6.00
	Total	379	100
2	Does the use of less hazardous chemicals or piece of equipment help offer protection against occupational hazards?		
	Yes	346	91.0
	No	25	7.00
	Don't know	8	2.00
	Total	379	100
3	Does 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
	Total	379	100
4	Is personal protective equipment effective safety measures for occupational hazards?		
	Yes	371	98.0
	No	8	2.00
	Total	379	100
5	Should unsafe procedures or situations be reported?		
	Yes	358	94.0
	No	21	6.00
	Total	379	100
6	Should you monitor your own health and safety status?		
	Yes	346	91.0
	No	25	7.00
	I don't know	8	2.00
	Total	379	100

Table 4: Knowledge of Safety Measures for Occupational Hazards among Respondents

Scores	Knowledge	Frequency	Percentage
1-2	Poor	8	2.00
3-4	Moderate	25	7.00
5-6	Good	346	91.0
	Total	379	100

Table 5: Categorization of Respondents' Knowledge of Safety Measures for Occupational Hazards (N=379)
(Field Survey, 2018)

Table4 and 5 show that 2.00% had poor knowledge, 7.00% had moderate knowledge while 91.0% had good knowledge of safety measures for occupational hazards.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.010E2[a]	10	.000
Likelihood Ratio	171.256	10	.000
Linear-by-Linear Association	93.085	1	.000
N of Valid Cases	379		

Table 6: The Association between Age and Knowledge of Safety Measures
a. 10 Cells (55.6%) Have Expected Count Less Than 5 the Minimum Expected Count Is .17

Table 6 shows that there is a statistically significant association between age and knowledge of safety measures for occupational hazards among the respondents as P=0.000 which is lower that P-value of 0.05. This reveals that there is a significant difference in the knowledge of safety measures for occupational hazards among the respondents based on their age

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.541E2[a]	6	.000
Likelihood Ratio	124.835	6	.000
Linear-by-Linear Association	71.897	1	.000
N of Valid Cases	379		

Table 7: The Association between Length of Service and Knowledge of Safety Measures
a. 6 Cells (50.0%) Have Expected Count Less Than 5 the Minimum Expected Count Is .49

Table 7 shows that there is a statistically significant association between length of service and knowledge of safety measures for occupational hazards among the respondents as P=0.000 which is lower that P-value of 0.05. This reveals that there is a significant difference in the knowledge of safety measures for occupational hazards among the respondents based on their length of service.

Scores	Practice	Frequency	Percentage
0-3	Do not practice	228	60.0
4-8	Practice	151	40.0
	Total	379	100

Table 8: Respondents' Practice of Safety Measures for Occupational Hazards (n=379)

Table 4b shows that 60.0% of the respondents do not practice safety measures for occupational hazards while only 40.0% practice safety measures for occupational hazards.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.227E2[a]	3	.000
Likelihood Ratio	412.779	3	.000
Linear-by-Linear Association	252.310	1	.000
N of Valid Cases	379		

Table 9: Cross-tabulation of Length of Service and Practice of Safety Measures for Occupational Hazards
a. 0 Cells (.0%) Have Expected Count Less Than 5 the Minimum Expected Count Is 9.47

Table 9 shows that there is a statistically significant association between length of service and practice of safety measures for occupational hazards among the respondents as P=0.000 which is lower that P-value of 0.05. This reveals that there is a significant difference in the practice of safety measures for occupational hazards among the respondents based on their length of service.

Scores	Attitude	Frequency	Percentage
0-3	Negative	266	67.0
4-8	Positive	113	33.0
	Total	379	100

Table 10: Respondents' Attitude towards the Practice of Safety Measures for Occupational Hazards (N=379)

Table 10 shows that 67.0% of the respondents have negative attitude while 33.0% have positive attitude towards the practice safety measures for occupational hazards.

Chi-Square Tests					
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.698E2[a]	1	.000		
Continuity Correction[b]	266.190	1	.000		
Likelihood Ratio	329.274	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	269.105	1	.000		
N of Valid Cases[b]	379				

Table 11: Attitude towards Occupational Hazards and Practice of Safety Measures among the Respondents
a. 0 Cells (.0%) Have Expected Count Less Than 5 The Minimum Expected Count Is 51.86.
b. Computed Only for a 2x2 Table

Table 11 shows that there is a statistically significant association between attitude towards occupational hazards and practice of safety measures for occupational hazards among the respondents as P=0.000 which is lower that P-value of 0.05.

4. Discussion

4.1. Knowledge of Occupational Hazards and Safety Measures among Workers in Petroleum Companies

Findings from the study revealed that majority of workers in oil and gas companies have good knowledge of occupational hazards and relevant safety measures. However, how knowledgeable employees of petroleum companies are about occupational hazards and safety protocols were not significantly influenced by the age of the employees. The length of services of the employees significantly influenced the knowledge of occupational hazard and safety measures among the workers as those with more years of work experience had good knowledge of hazards and safety in the workplace. These results are consistent with the findings of studies conducted by and Adebola (2014) and Akalonu, Nwaogazie and Ejikeme (2017)which revealed that a significant proportion of oil and gas workers are knowledgeable about occupational hazards and safety measures. This high knowledge level on occupational hazards and safety measures could be linked with the fact that most oil and gas companies organized periodic health, safety and environment trainings for its employees.

4.2. Practice of Safety Measures for Occupational Hazards among Workers in Petroleum Companies

Results from the study showed that a significant percentage of oil and gas workers do not actually practice safety measures for occupational hazards despite having adequate knowledge of the strategies for preventing workplace hazards. This result is in consonance with the submission of Adebola (2014) that majority of employees in petroleum companies rarely practice hazard prevention in the workplace. The findings of a study conducted by Inyang (2007) that a large proportion of oil and gas workers do not significantly implement safety protocols also substantiate the results of this study.

4.3. Attitude of Oil and Gas Workers towards the Practice of Safety Measures for Occupational Hazards

The study findings revealed that majority of oil and gas workers have negative behaviour towards the practice of safety measures in the workplace. Thus, there is a significant relationship between attitude and practices regarding safety measures for occupational hazards among employees of petroleum companies. These results agree with the findings of studies conducted by Adebola (2014) and Akalonu, Nwaogazie and Ejikeme (2017) which reveals that a large proportion of oil and gas workers are negative in their attitude towards occupational hazards prevention.

5. Conclusions

Safety and health management are crucial aspects of petroleum industry operations because core activities in the sector poses significant health, safety and environment issues. Inspite of the fact that oil and gas companies activities contributes significantly to any nation's economic development cases of hazard exposures abound. A large number of oil and gas workers, though knowledgeable about occupational hazard and safety measures do not actually practice preventive strategies for workplace related dangers. This is linkable to the attitude of the workers towards the practice of safety measures for occupational hazards as majority of employees whose attitude were negative did not practice workplace hazard prevention. It is therefore paramount that petroleum companies should not only organize health, safety and environment trainings, but also design and implement behavioural change programmes aimed at stimulating workers to take responsibility for their health and safety in the workplace

6. Acknowledgement

We are thankful to the Oil and Gas Companies that allowed their workers toparticipate in the study

7. Abbreviations

- PPE=Operational maintenance
- NIOSH=National Institute of Occupational Safety and Health
- ME=Microsoft Excel
- SPSS= Statistical Package for Social Sciences (SPSS)

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