Perceived Effect of Occupational Safety Measures on Workers’ Performance in Warri Refining and Petrochemical Company, Delta State, Nigeria

Ayoola Abidemi Agboola¹, Oluwaseun Taiwo Esan², Temitope Olumuyiwa Ojo², Olorunfemi Sunday Omotosho³

¹The Nigerian National Petroleum Corporation Medical Services, Warri, Delta State, Nigeria; ²Department of Community Health, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria; ³Department of Community Health, Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun State, Nigeria.

Abstract

Introduction: Occupational safety measures when put in place in organizations are expected to increase the productivity of employees and drive organizations to better performance. This study was aimed at assessing the perception of workers at the Warri Refining and Petrochemical Company (WRPC) on the effect of implemented occupational safety measures on their individual and organizational performance.

Materials and Methods: The study was cross-sectional in design conducted at the WRPC, Delta state, Nigeria, among 236 workers of the WRPC selected via a simple random sampling technique across different job cadres (junior, senior, and management) in the organization. Data were collected using a semi-structured self-administered questionnaire and analyzed using the descriptive and inferential statistical tests of the SPSS version 20 with statistical significance set at P < 0.05.

Results: The mean age of respondents was 43 ± 2.26 years with a male-to-female ratio of 1.8:1. More than 50% of the respondents attested that occupational safety measures had been well implemented at the WPRC. Almost all the respondents, 219 (92.8%) and 224 (94.9%), agreed that occupational safety measures in place and trainings on safety measures had improved individual worker’s performance, respectively. Respondents’ length of service and job cadres were significantly associated with their perceived effect of the existing occupational safety measures at the WRPC on individual worker and organizational performance (P < 0.001). They were also significantly associated with their perceived effect of the neglect of these safety measures on high labor turnover rate (P < 0.001).

Conclusion: Occupational safety measures were perceived to have positively affected workers’ and organizational performance.

Keywords: Implementation, occupational health, perception, performance, safety measures

INTRODUCTION

Management of safety and health is a key component of the oil and gas industry operations. This is because most of the operational conditions involve the use of chemicals and end-products such as hydrocarbons and other compounds which are well-known to pose serious threats to workers’ performance and well-being. Indeed, the oil and gas industry is more likely to experience occupational accidents owing to the nature of the industry and the difficult working conditions.¹ In Nigeria, proceeds from oil and gas is the largest income earner for the country, thereby making it the backbone of the nation’s economy.² In this regard, proper care and attention must be placed on managing and reducing fatal injuries in the oil industry which often leads to physical or emotional damage that may hinder performance in the workplace.

Following the growing universal call for safety of employees and the environment, Nigeria enacted the Mineral Oils (Safety) Regulations in 1997.³ Despite the United Nations Declarations⁴ and the country’s mineral oil safety regulations, there have been several cases of injuries that have resulted in permanent partial disabilities and permanent total disabilities, occupational illnesses, and oftentimes, outright death of employee in the oil...
and gas sector in Nigeria. Several factors have been adduced for fatalities in the oil and gas industry, even in Nigeria. These include equipment failure, supervisory failure, negligence, and violation of safety ethics.

The oil and gas industry is divided into the upstream, mid-stream, and downstream segments. The upstream segment is involved in exploration and production of crude oil and gas. The mid-stream segment is involved in transportation, sales, and marketing of petroleum products, while the downstream segment is involved in refining, storage, sales, and distribution of finished petroleum products. Warri Refining and Petrochemical Company (WRPC), a subsidiary of the Nigerian National Petroleum Cooperation, belongs to the downstream segment. The company is involved in the receipt of crude oil in giant tanks, fractionally cracking the crude to extract various inflammable components including petrol, diesel, and kerosene using extremes of temperatures and hazardous chemicals including carcinogenic materials and heavy equipment in physically intimidating columns of extreme heights with employees working under extremely hazardous conditions.

Hazards in WRPC can be physical, chemical, biological, and psychosocial. These hazards make safety a major concern. For these reasons, the management of WRPC puts great premium on the safety of employees, material assets, and the environment where it operates, and this is evident in the various safety measures put in place to demonstrate this commitment. The hazardous nature of her operations which predisposes the employees to the physical, chemical, biological, and psychosocial hazards warrants that various measures are put in place to ameliorate the effect of these hazards.

Some of these measures include training and re-training of staff on the importance of safety, the implementation of the Health, Safety, and Environment (HSE) management system framework, regular awareness campaigns on safety, and display of safety signage in necessary areas. Other measures in place are compulsory documentation and reporting of all accidents including incidents and near misses and provision of fire extinguishers and fire exit doors. Others include the provision of a comprehensive emergency response plan, mandatory use of personal protective equipment such as hard hats, hand gloves, safety boots, coveralls, face masks, ear muffs/plugs, mandatory periodic medical examinations for all workers within her premises, and many more. According to a study that evaluated the occurrence of hazards at the WRPC in 2014, all the members of staff at the WRPC are aware of these safety measures put in place by the management of the organization and they participate in them.

It is truly a fact that work is essentially an economic activity and companies are established to create or provide services for the market and in return generate revenue for themselves. However, when workers’ safety needs are met consistently, they display greater emotional attachment and involvement and express stronger feelings of allegiance, safety, commitment, and loyalty to their organizations. Therefore, occupational safety measures put in place with subsequent improved productivity of an employee are important business enablers that can drive organizations to a better performance.

Increasingly enlightened employers, together with trade unions, are striving to provide safer and healthier workplaces which can translate into increased productivity, more job satisfaction, and stronger bottom-line results. Researchers concerned with workplace illnesses and injuries have endeavored to quantify how the overall health and safety of an employee affects their ability to work productively and enhance organizational performance.

However, some people have argued that productivity and its gains are often at the expense of workers’ safety. This is with the belief that businesses typically strive to become more productive and in doing so, drive workers to work longer, harder, and more efficiently, often in extremely hazardous conditions and only implement occupational safety measures to keep compensation costs down. Over the past decade, workers are spending more time at work in many industrialized countries, and as a result, work-related stress and fatigue have become major issues. In short, implementing occupational safety measures to increase productivity may create the opposite of the desired effect.

Several documentations on the various degrees of fatalities experienced by workers in oil and gas industry, the risk perception of workers on their workplace environment, the relationship between workers’ perception of their workplace environment on their job satisfaction and productivity, among others are available in literature. Nevertheless, how workers perceive the effect of occupational safety measures implemented in their workplace environment on their individual and organizational performance, particularly in the oil and gas industry seems to be sparse in literature.

Answering this question can serve as an indirect measure for managers of such organizations on the relevance attributed to perceived safety measures on worker and organizational performance. The implication of these to ensuring more commitment to safety in organizations cannot be overemphasized. To this end, the study objectives were to assess the perception of workers at the WRPC on the implementation of existing occupational health measures in the organization, how these measures are perceived to have affected workers’ performance at work and to identify factors that may be associated with their perception.

**Materials and Methods**

The study was descriptive cross-sectional in design, conducted among workers across the 19 departments at the WRPC, in Delta State, South–South, Nigeria, with an estimated 750 workers in total at the time of conducting the study. The departments include the administration, public affairs, internal audit, finance and accounts, production, commercial, and
human resources to mention a few. A calculated sample size of 255 respondents was derived using the Cochran formula for single proportions where \( n = Z^2 pq/d^2 \), with an assumed prevalence \( (p) \) of 50% for proportion of workers who were aware of the effect of occupational safety measures on workers’ performance. The confidence limit was set at 95% with a 5% acceptable error margin \( (d) \) and adjusted to the total population \( (N) \) of 750 workers with the formula \( n/1 + n/N \) and \( n \) is the calculated sample size. To allow for a 10% attrition rate, 283 respondents were reached.

Proportionate sampling to size was used to determine the number of respondents per department and per cadre of staff. Simple random sampling technique (balloting) was then used to select respondents from the generated list of workers per cadre of staff per department, which served as the sampling frames. If anyone selected declined participation, another was selected from the pool.

Data were collected using a structured, anonymous questionnaire by trained investigators who are non-staff of the organization from October to November, 2015. Data generated was analyzed with IBM SPSS version 20 (IBM Corp., Armonk, N.Y., USA). The perception of the respondents on the effect of occupational safety measures on performance and the level of implementation of these occupational safety measures in their organization were the outcome measures.

Categorical variables such as sex, educational qualification, marital status, and job cadre of the respondents were summarized using frequencies and percentages, while mean and standard deviation were calculated for their age and length of service. Respondents were asked if they agreed or disagreed with variables measuring the effect of occupational safety measures on their performance and the level of implementation of these occupational safety measures at the WRPC. Factors associated with their perception were determined using the Chi-square test with the level of statistical significance set at \( P < 0.05 \).

Verbal informed consent was obtained from the participants. Approval to collect the data was obtained from the WRPC Ethical Committee. The purpose for the data collection which was strictly for academic pursuits was clearly explained to the respondents. Confidentiality of data was maintained and survey tools were designed as anonymous. Respondents were free to withdraw from the study at any time during the conduct of the study with no negative consequences for their decline to participate.

**RESULTS**

Two hundred and thirty-six participants completed the survey tools giving a response rate of 92.5%. The mean age of respondents was 43 ± 2.26 years with a male-to-female ratio of 1.8:1 and a mean length of years of service of 20 ± 2.28 years. Most of the respondents were married (196 [83%]), had postgraduate levels of education completed (125 [53%]), and

| Sociodemographic variables | Frequency (%) |
|----------------------------|---------------|
| Sex                        |               |
| Male                       | 152 (64.0)    |
| Female                     | 84 (36.0)     |
| Age (years)                |               |
| ≤ Mean age (43)            | 93 (39.4)     |
| > Mean age (43)            | 143 (60.6)    |
| Marital status             |               |
| Single                     | 38 (16.0)     |
| Married                    | 196 (83.0)    |
| Widowed                    | 2 (1.0)       |
| Educational qualifications |               |
| GCE ‘O’ level*             | 15 (7.0)      |
| City and guild/OND**       | 27 (11.0)     |
| Graduate degree            | 69 (29.0)     |
| Postgraduate               | 125 (53.0)    |
| Length of service (years)  |               |
| ≤20                        | 101 (42.8)    |
| >20                        | 135 (57.2)    |
| Job status in WRPC         |               |
| Junior staff               | 50 (21.0)     |
| Senior staff               | 147 (62.0)    |
| Management staff           | 39 (17.0)     |

*General certificate of education (ordinary level); **Nigeria certificate in education/Ordinary National Diploma. WRPC – Warri Refining and Petrochemical Company

were in the senior staff cadre (147 [62%]) [Table 1].

The perception of respondents on the extent of implementation of safety measures and regulations in the organization was assessed. A high proportion of them agreed that employees in WRPC adhered to safety practices and conformed to safety standards (144 [61%]). They also agreed that safety tips are put in place in appropriate measures within the company (184 [78%]). Majority of the respondents, 170 (72%), opined that the current level of safety observance by employees in the WRPC was good. Most of them, 189 (80%), agreed to the existence of safety officers put in place to respond to safety issues, while almost all the respondents, 213 (90.2%), concurred that it was mandatory for workers to participate in workplace safety activities and that appropriate first-aid supplies were provided for the employees as stated by 209 (88.6%) of the respondents [Table 2].

Findings showed that almost all the respondents agreed that the occupational safety measures put in place helped to enhance workers’ performance (219 [92.8%]), served as a motivational factor (219 [92.8%]), and that the training provided has improved individual worker’s performance (224 [94.9%]). Barely more than half of the respondents, 134 (56.8%), believed that neglect of occupational safety measures may lead to high rate of labor turnover. Most of them, 212 (89.8%), agreed that work-related hazards had a negative effect on workers’ performance (196 [83.1%]). They also believed that there is
a direct relationship between occupational safety measures ensuring employee safety and organizational productivity. Majority of the respondents also perceived that occupational safety measures had a positive effect on employee’s job satisfaction (177 [75%]) [Table 3].

A higher proportion of respondents who had worked at the WPRC for more than 20 years as well as those at the senior cadre and managerial levels agreed that the safety measures in place helped to enhance the organizations’ performance, and these findings were statistically significant. Conversely, a higher proportion of the workers with 20-year work experience or less at the WPRC and those in the junior staff cadre reported a perceived neglect of occupational safety measures leading to high rates of labor turnover. These findings were also statistically significant. However, the length of service of the workers at the WPRC and their cadre at work had no significant effect on their perception about work-related hazards having a negative effect on workers’ performance as well as employees’ safety resulting into increased productivity at the WPRC [Table 4].

**Discussion**

WRPC generates some hazardous chemicals (including some that are carcinogenic) and utilize heavy equipment while carrying out work activities. These inherent hazards in the work place environment have made it necessary for the management of the company to establish various safety measures known to the workers to mitigate their effects on the employees. This study has tried to assess the perception of the workers on the effect of these occupational safety measures on the organizations’ and their individual work performance.

There were more male respondents studied than females at the WRPC. This is not surprising as the oil and gas industry itself is a male dominated industry and this has been corroborated by other studies. The implications of this on safety are possible higher occurrence of occupational accidents and deaths among men and the socioeconomic effects of this on their immediate family, community, and the nation.

Findings showed that majority of the respondents were aware of occupational safety measures at the WPRC and perceived that these have been well implemented at the organization. This is similar to the findings in 2014 when the knowledge and awareness of occupational hazards among workers at the WPRC were studied and the occupational health practice in the organization evaluated. This is an encouraging finding for the management of this organization. They must however continue to conform to best global practices as defined by the International Labour Organization, ensuring that conducive ambience and safety measures are always in place in the organization.

Job status and length of service were significantly associated with workers’ perception of the implementation of occupational safety measures at the WPRC and its effect on the employee and organizations’ performance. From this study, the longer an employee stays on the job, the more he/she is likely to appreciate the importance of his safety and the well-being of his organization. The higher the rank on the ladder of job status, the more the appreciation of safety becomes influential. Similarly, in a study published in 2014, it was also found that workers with more than 6 years’ length of service at the Pipelines Product and Marketing Company, which is also a subsidiary of the Nigerian National Petroleum Corporation, had positive compliance with occupational safety measures. This suggests that they also better appreciate their safety.

These findings may be explained by the educational status of the employees as the more educated employees are more likely to be high on the job cadre and do appreciate the need
to work and stay safe on their job. The senior cadre staff are also closer to the management and may be more aware of their efforts and motive at providing these safety measures in the organization. To prevent this from constituting a bias, the respondents were disaggregated into the junior, senior, and management staff categories. Hence, the responses from the senior staff have not been diluted by those of the management staff.

Table 4: Factors associated with the workers’ perception of the effect of occupational safety measures on organizational performance

| Factors                                                                 | Frequency (%) | Test of statistical significance, \( \chi^2 \) value; (degree of freedom); \( P \) |
|------------------------------------------------------------------------|---------------|--------------------------------------------------------------------------------|
|                                                                      | Agree | Disagree | Total |                                                                 |
| **Occupational safety measures in the WRPC help to enhance organizational performance** |       |          |       |                                                                 |
| Length of service (years)                                              |       |          |       |                                                                 |
| ≤20                                                                    | 56 (55.4) | 55 (44.6) | 101 (100.0) | \( \chi^2=32.8; (1); P<0.001 \) |
| >20                                                                    | 114 (78.2) | 21 (21.8) | 135 (100.0) |                                                                 |
| Job status/cadre                                                       |       |          |       |                                                                 |
| Junior staff                                                           | 30 (60.0) | 20 (40.0) | 50 (100.0) | \( \chi^2=13.766; (2); P=0.001 \) |
| Senior staff                                                           | 115 (78.2) | 32 (21.8) | 147 (100.0) |                                                                 |
| Management staff                                                       | 36 (92.3) | 3 (7.7) | 39 (100.0) |                                                                 |
| **A good working condition acts as a motivational factor to employees’ performance** |       |          |       |                                                                 |
| Age (years)                                                            |       |          |       |                                                                 |
| ≤43                                                                    | 90 (96.8) | 3 (3.2) | 93 (100.0) | \( P=0.172^* \) |
| >43                                                                    | 135 (91.8) | 12 (8.2) | 147 (100.0) |                                                                 |
| Job status                                                              |       |          |       |                                                                 |
| Junior staff                                                           | 48 (96.0) | 2 (4.0) | 50 (100.0) | \( LR^2=10.919; (1); P=0.004 \) |
| Senior staff                                                           | 123 (83.7) | 24 (16.3) | 147 (100.0) |                                                                 |
| Management staff                                                       | 38 (97.5) | 1 (2.5) | 39 (100.0) |                                                                 |
| **Safety training and proper orientation in an organization improve workers performance** |       |          |       |                                                                 |
| Job status                                                              |       |          |       |                                                                 |
| Junior staff                                                           | 37 (74.0) | 13 (26.0) | 50 (100.0) | \( \text{Likelihood ratio}=3.638; (1); P=0.162 \) |
| Senior staff                                                           | 103 (70.0) | 44 (30.0) | 147 (100.0) |                                                                 |
| Management staff                                                       | 33 (84.6) | 6 (15.4) | 39 (100.0) |                                                                 |
| **Neglect of occupational safety will further lead to high rate of labor turnover** |       |          |       |                                                                 |
| Length of service (years)                                              |       |          |       |                                                                 |
| ≤20                                                                    | 90 (89.1) | 11 (10.9) | 101 (100.0) | \( \chi^2=12.707; (1); P<0.001 \) |
| >20                                                                    | 94 (69.6) | 41 (30.4) | 135 (100.0) |                                                                 |
| Job status                                                              |       |          |       |                                                                 |
| Junior staff                                                           | 46 (92.0) | 4 (8.0) | 50 (100.0) | \( \text{Likelihood ratio}=23.403; (1); P<0.001 \) |
| Senior staff                                                           | 132 (89.8) | 15 (10.2) | 147 (100.0) |                                                                 |
| Management staff                                                       | 22 (56.4) | 17 (43.6) | 39 (100.0) |                                                                 |
| **Work-related hazards have a negative effect on workers’ performance in WRPC** |       |          |       |                                                                 |
| Length of service (years)                                              |       |          |       |                                                                 |
| ≤20                                                                    | 76 (75.2) | 25 (24.8) | 101 (100.0) | \( \chi^2=0.534; (1); P=0.465 \) |
| >20                                                                    | 107 (79.3) | 28 (20.7) | 135 (100.0) |                                                                 |
| Job status                                                              |       |          |       |                                                                 |
| Junior staff                                                           | 43 (88) | 6 (12) | 50 (100.0) | \( \text{Likelihood ratio}=3.940; (1); P=0.139 \) |
| Senior staff                                                           | 130 (88.4) | 17 (11.6) | 147 (100.0) |                                                                 |
| Management staff                                                       | 38 (97.4) | 1 (2.6) | 39 (100.0) |                                                                 |
| **There is a direct relationship between employee’s safety and productivity in WRPC** |       |          |       |                                                                 |
| Length of service (years)                                              |       |          |       |                                                                 |
| ≤20                                                                    | 93 (92.1) | 8 (7.9) | 101 (100.0) | \( \chi^2=1.727; (1); P=0.189 \) |
| >20                                                                    | 117 (82.7) | 18 (13.3) | 135 (100.0) |                                                                 |
| Job status                                                              |       |          |       |                                                                 |
| Junior staff                                                           | 28 (56.0) | 22 (44.0) | 50 (100.0) | \( \text{Likelihood ratio}=3.375; (1); P=0.185 \) |
| Senior staff                                                           | 91 (61.9) | 56 (38.1) | 147 (100.0) |                                                                 |
| Management staff                                                       | 29 (74.4) | 10 (25.6) | 39 (100.0) |                                                                 |

WRPC – Warri Refining and Petrochemical Company. *Fishers exact= \( P=0.172 \) (it has no Chi-square value, because one cell had an expected cell count <5)
Another significant finding from the study was the higher proportion of workers in the junior category and with a shorter length of stay in the organization, who perceived a possible neglect of occupational safety measures which may lead to further labor turnover. The junior workers may be more conscious of the hazards as they interface more frequently with the machineries and heavy equipment. They are therefore more prone to these hazards compared to those in the senior cadre. This is similar to the findings obtained when the risk management policies and practices of the Nigerian Liquefied Natural Gas company, an extractive industry of the oil and gas industry, were assessed.\textsuperscript{21} They found that a higher proportion of the junior staff compared to the senior staff were not satisfied with the company’s implementation of its risk management policy and conformity with international HSE standards.

Organizations must understand that work-related accidents arise from the interaction among human, machine, and their work environment.\textsuperscript{22} Organizations must therefore ensure that there is a harmonious relationship between the individual worker and the machines as well as the general work environment. For the management of the organization to always enjoy their commitment to work, they will need to intensify efforts at continuously providing safety measures to this category of staff who are more exposed to more injury and stress on the job. This is expected to improve employee job satisfaction and increased individual and organizational performance.

\textbf{Conclusion}

This study has succeeded in establishing that there is a strong safety culture in WRPC exemplified most significantly by good access to safety tips/information, workers being compelled to participate in workplace safety activities that preserve their well-being. Indeed, there is increasing and compelling evidence that providing a healthy and safe work environment has the potential to increase labor productivity by boosting worker’s job satisfaction, reduce labor turnover, encourage workers to take responsibility for their safety and that of others, and, in turn, increase business profits. The authors however recommend that attention should be focused on the staff at the lower end of the job cadre to embrace good safety practices. Assessing the effect of occupational safety measures on workers’ performance from the perspectives of the workers’ is good but limited, as this is not an objective measure. There is also a need to directly measure the organizational performance and determine if the presence of these occupational safety measures has any direct effect on the directly measured organizational performance.

\textbf{Financial support and sponsorship}

Nil.

\textbf{Conflicts of interest}

There are no conflicts of interest.

\textbf{References}

1. Mearns K, Yule S. The role of occupational culture in determining safety performance: Challenges for the global oil and gas industry. Saf Sci 2009;47:777-85.
2. Ihua UB, Ajayi CE. Nigerian Content Policy in the Oil and Gas Industry: Implications for Small to Medium-Sized Oil-Service Companies. In: 10th Annual Conference-IABBD; 2009. p. 163-70. Available from: https://pdfs.semanticscholar.org/c732/9b88b2a6a226a0cb9696158d180786f729c.pdf. [Last accessed on 2020 Feb 24].
3. Federal Government of Nigeria. The Petroleum Act (CAP 350 LFN: Mineral Oils (Safety) Regulations. Nigeria: Federal Government of Nigeria; 1997. Available from: http://www.ngfcp.gov.ng/media/1064/minerals-oils-safety-regulations-mosr-1997.pdf. [Last accessed 2019 Mar 12].
4. International Labour Organization. Prevention of Major Industrial Accidents Convention. 1993. Geneva, Switzerland: International Labour Organization; 1997. Available from: https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0:NO:P12100_1LO_CODE:C174. [Last accessed on 2019 Mar 18].
5. Ibrahim NH, Allen DK. Information sharing and trust during major incidents: Findings from the oil industry. J Am Soc Inf Sci Technol 2012;63:1916-28.
6. Eyayo F. Evaluation of occupational health hazards among oil industry workers: A case study of refinery workers. IOSR J Environ Sci 2014;8:2319-99.
7. Wapper A. Downstream Beneficiation Case Study: Nigeria: Columbia; 2017. Available from: http://csci.columbia.edu/files/2013/10/Nigeria-Case-Study-May-2017_CCSI-Final-2.pdf. [Last accessed on 2019 Mar 17].
8. Askhia MO, Emenike G. Occupational health and safety in the oil and gas industry in Nigeria. JIRIND 2013;11:1596-8303. Available from: https://www.trancampus.org/JIRINDV11Dec2013/JIRIND Vol11 No2 Dec Chapter9.pdf. [Last accessed on 2017 Mar 03].
9. Ezefojo T, Nwigwe H, Osuala F, Iwuala M. Appraisals for potential hazards in the operational environment and facilities of petroleum refining and distribution industry in Nigeria. J Med Investig Pr 2014;9:39-42.
10. Aliyu A, Saidu S. Pattern of occupational hazards and provisions of occupational health and safety among workers of Kaduna refinery and petrochemical company Ltd (KRPC), Kaduna, Nigeria. Cont J Trop Med 2011;5:1-5.
11. Tomoloju VO. Technical Report on Student Industrial Work Experience Scheme with the Warri Refining and Petrochemical Company. Ota, Nigeria; 2018. Available from: https://www.academia.edu/37577084/Technical_Report_on_My_Industrial_Training_at_Warri_Refining_and_Petrochemical_Company_WRPC_Electrical_Power_Plan?au=download. [Last accessed on 2019 Mar 18].
12. Omotayo A, Eseme D. Relationship modeling between work environment, employee productivity, and supervision in the Nigerian public sector. Am J Manag 2015;15:9-23.
13. Akinjeyle ST. The influence of work environment on workers productivity: A case of selected oil and gas industry in Lagos, Nigeria. African J Bus Manag 2010;4:299-307.
14. Griffiths J, Hayley M, George E. ‘Stakeholder Involvement’ Background Paper Prepared for the WHO/WEF Joint Event on Preventing Non-Communicable Diseases in the Workplace (Danian/ China, September 2007). Geneva, Switzerland: WHO Press; 2008.
15. Lamm F, Massey C, Perry M. Is there a link between workplace health and safety and firm performance and productivity? New Zealand Emp Rel Relations 2006;32:75-90. Available from: https://search.informit.com.au/documentSummary;dn=135846714466567;res=IELNZC. [Last accessed on 2019 Mar 18].
16. Hymel P, Loeppke R, Baase C, Berger M, Burton W, Lynch W, et al. Establishing a research agenda in health and productivity: Position statement. Occup Environ Med 2004;46:518-20.
17. Quinlan M, Mayhew C, Bohle P. The global expansion of precarious employment, work disorganization, and consequences for occupational health: A review of recent research. Int J Health Serv 2001;31:335-414.
18. Rasmussen E, Lind J, Visser J. Working time Arrangements: What
19. Seleye-Fubara D, Bob-Yellowe E. Industrial accidental deaths in the Niger delta region of Nigeria: A study of 32 autopsies in Port Harcourt. Med Sci Law 2006;46:342-6.

20. Adebola JO. Knowledge, Attitude and Compliance with Occupational Health and Safety Practices among Pipeline Products and Marketing Company (PPMC) Staff in Lagos. Merit Res J Med Med Sci 2014;2:2354-38.

21. Andeobu L, Hettihewa S, Wright CS. Risk Management in the Extractive Industry: An Empirical Investigation of the Nigerian Oil and Gas Industry. Appl Bus Econ 2015;17:86-102.

22. International Labour Organization. Accidents and Safety Management: Accident Prevention. In: Saari J, editor. Encyclopedia of Occupational Health and Safety. Fourth; 2011. Available from: http://www.iloencyclopaedia.org/contents/part-viii-12633/accident-prevention. [Last accessed 2019 Apr 14].