

Pattern and Prevalence of Occupational Injuries in Major Oil Companies in Port Harcourt

Korie, A.U¹ and Ugwoha, E^{1,2*}

¹Centre for Occupational Health, Safety & Environment, Institute of Petroleum Studies, University of Port Harcourt

²Department of Civil & Environmental Engineering, University of Port Harcourt

*Corresponding Author's Email Address: ugwohaej@gmail.com

Abstract

This study ascertained the pattern and prevalence of occupational injuries in selected major oil companies in Port Harcourt, Nigeria. A descriptive research design was adopted. The target population was four multinational oil producing companies that operate in Port Harcourt. The target population was 80 full staff (field engineers). This was because most incidents are recorded in the field rather than in the administrative offices. Random sampling method was applied in choosing a sample size of 70. Both interviews and survey (questionnaire) of both structured and semi-structured nature were adopted for data collection. The results obtained showed that the pattern of occupational injuries in oil companies is as follows: Bone fracture (27.1%) > Burn (Chemical) (20%) > Burn (Scald/Heat) (14.3%) > Ergonomic Injury (12.9%) > Concussion / Brain Injury (10%) > Irritation from hazardous atmosphere (8.6%) > Dislocation (7.1%). In terms of the prevalence of occupational injuries in oil companies, the results exposed that 37.1% of workers have had pain or discomfort caused by or made worse by their present work, 21.4% reported pain or discomfort to management, 15.7% indicated that they have used one or more days of sick or vacation leave due to work related pain or discomfort, and 7.1% agreed that they have filed work-related injury compensation claim, during the past 12 month, indicating a high prevalence of occupational injuries in the studied oil companies.

Keywords: Occupational injuries, Oil companies, Port Harcourt, Prevalence, Pattern

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1. Introduction

Oil and Gas Industry faces a number of evolving and various types of risks and hazards that give rise to serious incidents. Work-related incidents constitute a social phenomenon and one of the major problems all over the world, despite all the implemented safety control measures in any organization and the improvements in work-related safety. The incidents rates have increased alongside the industrial revolution and the rapid globalization of the world. As a result, all sectors suffer from all types of adverse events ranging from deadly incidents to minor injuries at the workplace. Statistics show that in every 15 seconds one worker dies from an occupational related incidence, and 153 workers have a work accident. In addition, 6300 people passed away daily as a result of occupational related incidences or work-related ill-health. These work accidents affect negatively both the company performance and bottom-line as well as the economic growth (Hämäläinen *et al.*, 2005). These statistical figures relate to the occupational

accidents and diseases which are reported and recorded globally but do not reflect the real safety record situation of most companies, since there are cases of underreporting, especially in developing countries. So, the real figures are likely to be higher than the current recorded ones (Nenonen *et al.*, 2010), and a few catastrophic cases of these incidents receive public attention (Hämäläinen *et al.*, 2005; ILO, 2003). Such incidents can significantly have a negative impact on the profitability of the business as they are associated with direct and indirect costs.

The Oil and Gas Industry plays a crucial role in driving the global economy. It is the cornerstone to growth and production across the nations. However, occupational related incidences catastrophically take place in the oil and gas industry more than others. In the oil industry, particularly the offshore workers, given the demanding factors involved in the type of work they undertake, face many challenges. Offshore personnel working on an installation can be

exposed to demands that far outweigh that of similar comparable work onshore. Shift patterns, risk exposure, working away from family and friends, sometimes in remote and hostile locations for long periods of time (as long as 4 weeks) and carrying out sometimes repetitive and monotonous work can lead to physical and mental stressors which can have a negative impact on the workers life, as well as their relationships with family and friends (Parkes, 2002). Thus, the aim of this study was to ascertain the pattern and prevalence of occupational injuries in selected major oil companies in Port Harcourt.

2. Materials and methods

2.1. Research design

A descriptive research design was adopted for this study. According to Kothari (2004), the main aim of descriptive design approach is portrayal of the situation as it exists at present. As indicated by Orodho (2003, 2012), the descriptive survey design is powerful, and simple to carry out and it likewise guarantees ease in getting access to data.

2.2 Study area

This study was conducted in Port Harcourt. Port Harcourt is a metropolitan city and capital of Rivers state, occupying approximately 1811.6 km² area, with a population of about 1.5 million. It constitutes the state's main city and has one of the largest seaports in the Niger Delta region, thus being the centre of administration, commerce, and industrial activities. It is situated between Latitude 4°45' N and 4°55' N, and Longitude 6°55' E and 7°05' E, occupying the entrance of the Bonny River. The city is bounded in the north by Abia and Imo states; east by Akwa-Ibom state; west by Bayelsa state, and south by the Atlantic Ocean

(Fig. 1). Its estimated mean altitude is 12 km above average sea level, lying between the Dockyard creek/Bonny River and the Amadi creek.

Climatically, Port Harcourt undergoes two distinct seasons viz dry and rainy. Nonetheless, the atmosphere sustains adequate moisture throughout the year. The city's proximity to the South Atlantic explains this trend - nearness of inlands to the Atlantic increases annual relative precipitation, thus this characteristic assures heavy and persistent rainfall, owing to the strong south-west wind. Wind force reduces as it approaches inland. Mean maximum and minimum temperatures are approximately 34°C and 21°C, respectively - the months of April through October having the highest temperatures.

Like other Nigerian States, the interaction between two major pressures and wind systems drives the entire weather system in Port Harcourt. They include the two actively produced sub-tropical high-pressure cells (anticyclones) that are centered over Azores Archipelago (off the west coast of North Africa) and St. Hellena Islands (off the coast of Namibia). These permanent high-pressure centres create and run the Northeast trade winds and the South-West winds, respectively, which are the northward extension of the re-curved Southeast trade winds of the South Atlantic Ocean.

Geographical location and topography of Port Harcourt is such that air borne pollutants travel fast and the farthest, as high lands are practically absent. Studies suggest that periodic plumes of pollutants from industrial discharges, a principal source of air pollution, constitutes a frequent occurrence in the city. Furthermore, occurrence of land breeze, as well as Harmattan, facilitate emission transfer into the city.

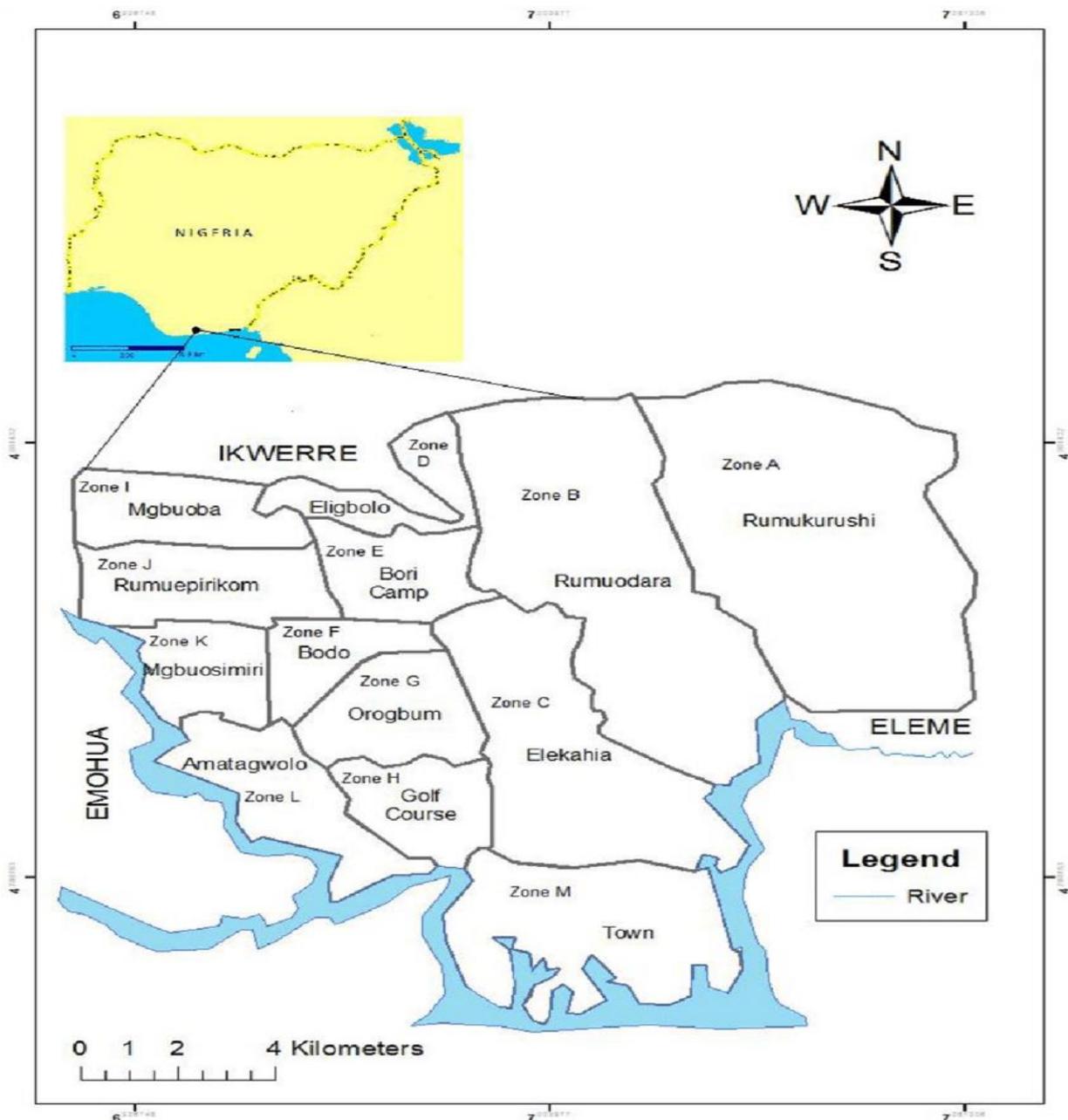


Fig. 1: Map of Rivers State showing Port Harcourt metropolis.

2.3 Study population

A total of four (4) multinational oil companies that operate in Port Harcourt were purposefully selected for this study. The inclusion criteria were full/main permanent staff of these companies and that the participants must be field Engineers. This is because most incidents are recorded in the field rather than in the administrative offices. Contract staff were excluded from the study. Thus, the estimated total workforce (the target population) for the selected companies was 80 full staff (field engineers).

2.4 Sampling technique and sample size

Random sampling method was applied in choosing the samples for the study. The random sample size for the present study was derived using Taro Yamane's statistical technique with a certainty level of 95% and 5% margin error. With a study population of 80, the sample size was calculated to be 70 using Equation (1).

$$n = \frac{N}{1 + N(e)^2} \quad (1)$$

where n is the sample size, N is the population size, and e is the marginal error (0.05) (assuming a

confidence level of 95%). Table 1 shows the selected oil companies. distribution of the sample size among the four (4)

Table 1: Sample size distribution

Oil and Gas Company	Sample Size
Total E & P Ltd	15
Shell Petroleum Development Company	25
Agip	15
Exxon Mobil	15
Total	70

2.5 Data collection

As indicated by Creswell (2005), no single strategy or instrument might be viewed as sufficient in itself in gathering legitimate and dependable data. Thus, two significant instruments were utilized to get sufficient and reliable data for this study. These were interviews and survey (questionnaire) of both structured and semi-structured nature. The questionnaire was administered through email to the respondents. The respondents, upon completion of questionnaire also emailed back the completed questionnaire. The interview was conducted either via physical or telephone discussion with either one individual or a group of individuals. About 10% of the sample size were interviewed.

2.6 Data analysis

Data obtained were subjected to descriptive statistics using the Statistical Package for the Social Sciences (SPSS) version 22 and presented in tables and charts.

3. Results and discussion

3.1 Questionnaire distribution and retrieval

Table 1 summarized the questionnaire distribution and retrieval among the studied oil companies. All administered 70 copies of questionnaire were retrieved successfully and found valid giving a 100% retrieval rate. This surpasses the threshold mark of 50% as recommended, hence the study considers the number to be sufficient for use in the data analysis.

Table 4.1: Copies of questionnaire administered and retrieved

Companies	Distributed	Retrieved	Rate
Total E & P Ltd	15	15	100%
Exxon Mobil	15	15	100%
Agip	15	15	100%
Shell Petroleum Development Company	25	15	100%

3.2 Demography of respondents

Table 2 presents respondents demographic information such as age, gender, work experience, and highest education qualification. The result shows that over 40% of the respondents are within the age grade of 31-40 years while 21% are within 21-30 years. This is followed by 20% who are in the age group of 41-50 years. Also, the result showed that the majority of the respondents are male constituting 62.9% of the sample size whereas

37.1% are female. Further, the result shows that about 54.3% of the respondents have <4 years work experience, 35.7% have between 4 -10 years' work experience while 10% respondents have 10 years work experience. Finally, 58.6% of the respondents have obtained a BSc degree, 31.4% have MSc while 10% have PhD. These demographics indicate that the respondents are knowledgeable adults that can provide valid information.

Table 2: Demography of respondents

Variables	No. of Respondent	Percentage (%)
Age		
21-30 years	15	21.4%
31-40 years	29	41.4%
41-50 years	14	20%
51 years and above	12	17.1%
Total	70	100%
Gender		
Male	44	62.9%
Female	26	37.1%
Total	70	100%
Work Experience		
< 4 years	38	54.3%
4-10 years	25	35.7%
10 years and above	7	10%
Total	70	100%
Highest Education Qualification		
BSc	41	58.6%
MSc	22	31.4%
PhD	7	10%

3.3 Pattern of occupational injuries in oil companies

The injuries workers of oil companies have sustained and also susceptible to are clearly defined by respondent in the pattern shown in Table 3. The

result reveals that oil workers mostly encounter bone fracture, followed by burns (chemical and heat), and ergonomic injury among others. Dislocation is the least encountered.

Table 3: Responses to the pattern of occupational injuries in oil companies

Injury	Frequency	Percent	Cumulative Percent
Bone fracture	19	27.1	27.1
Burn (Chemical)	14	20.0	47.1
Ergonomic Injury	9	12.9	60.0
Dislocation	5	7.1	67.1
Burn (Scald/Heat)	10	14.3	81.4
Concussion / Brain Injury	7	10.0	91.4
Irritation from hazardous atmosphere	6	8.6	100.0
Total	70	100.0	

3.4 Prevalence of occupational injuries in oil companies

Table 4 presents the prevalence of injuries sustained by workers of oil companies. The result shows clearly that over 37% of the respondents have had pain or discomfort caused by or made worse by work during the last 12 months. It also reveals that more than 21% reported pain or

discomfort to management during the past 12 months while over 15% indicated that they have used one or more days of sick or vacation leave for the work-related pain or discomfort during the past 12 months. This implies a high prevalence of occupational injuries in the oil industry. This finding is in agreement with those of Hamalainen *et al.* (2005) and Nenonen *et al.* (2010).

Table 4: Responses to prevalence of occupational injuries in oil companies

Prevalence	Frequency	Percent	Cumulative Percent
Had pain or discomfort caused by or made worse by work during the past 12 month	26	37.1	37.1
Used 1 or more days of sick or vacation leave for this work-related pain or discomfort during the past 12 months	11	15.7	52.9
Reported this pain or discomfort to management during the past 12 months	15	21.4	74.3
Filed work-related injury workers' compensation claim during the past 12 month	5	7.1	81.4
Filed at least 1 work-related workers' compensation injury claim since began working here	7	10.0	91.4
Ever had work-related injury at current company that was not reported	6	8.6	100.0
Total	70	100.0	

4. Conclusions

This study investigated the pattern and prevalence of occupational injuries in major oil companies in Port Harcourt, Nigeria. The results obtained showed that the pattern of occupational injuries in oil companies is as follows: Bone fracture (27.1%) > Burn (Chemical) (20%) > Burn (Scald/Heat) (14.3%) > Ergonomic Injury (12.9%) > Concussion / Brain Injury (10%) > Irritation from hazardous atmosphere (8.6%) > Dislocation (7.1%). In terms of the prevalence of occupational injuries in oil companies, the results exposed that 37.1% of workers have had pain or discomfort caused by or made worse by their present work, 21.4% reported pain or discomfort to management, 15.7% indicated that they have used one or more days of sick or vacation leave due to work related pain or discomfort, and 7.1% agreed that they have filed work-related injury compensation claim, during the past 12 month, implying a high prevalence of occupational injuries in the studied oil companies. It is therefore recommended that replicate studies be performed in other sectors like manufacturing, processing, and construction in order to be able to make wide a generalisation with regards to the pattern and prevalence of occupational injuries.

References

- Creswell, J.W. (2005) *Research Design: A qualitative, quantitative and mixed method approaches*. London: Sage Publication Inc.
- Hamalainen, P., Takala, J. and Saarela, K.L. (2005) Global estimates of occupational accidents. *Safety Science*, 44: 137–156.
- ILO (International Labour Organisation) (2003) *Safety in numbers: Pointers for global safety culture at work*. Geneva, 2003. International Labour Office Geneva.
- Kothari, C.R. (2004) *Research Methodology: Methods and Techniques*. 2nd Edition, New Age International Publishers, New Delhi.
- Nenonen, N., Saarela, K.L., Takala, J., Kheng, L.G., Yong, E., Ling, L.S., Manickam, K. and Hämäläinen, P. (2014). *Global Estimates of Occupational Accidents and Work-related Illnesses 2014*. WSH Institute.
- Orodho, J.A. (2003) *Essentials of education and social sciences research methods*. Nairobi: Pauline's Publications Africa.
- Orodho, J.A. (2012) *Techniques of writing research proposals and reports in education and social sciences*. Maseno/Nairobi: Kanazja HP Enterprises.
- Parkes, K.R. (2002) Psychosocial aspects of stress, health and safety on North Sea installations. *Scandinavian Journal of Work, Environment & Health*, 24: 321-333.