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Occupational Health Hazards and Workers Safety in Selected Chemical Waste Management Companies in Rivers State

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Abstract

This study contributes towards knowledge in the area of occupational health hazards and workers safety by empirically examining the relationship between the variables within the unique socio-economic context of chemical waste companies in Rivers State, Nigeria. The study adopts the cross sectional survey design and data is generated through self-administered questionnaire copies. Data for the analysis was generated from a total of 192 participants selected from four chemical waste companies in Rivers State. The analysis centered on investigating the influence of occupational health hazards on the four identified measures of workers safety, namely: workers evacuation, safety control measures, implementation of safety and job satisfaction. The univariate analysis revealed that on the average, most of the respondents affirmed to the significant manifestations of the variables within their various organizations. For the bivariate hypotheses, the Spearman's rank order correlation was utilized in testing the extent of correlations between occupational health hazards and the measures of workers safety. The results revealed significant correlations in all instances, affirming the position of occupational health hazards as a significant predictor of workers safety. As such, all four (4) null hypotheses of no significant relationships were rejected. In conclusion this study asserts that occupational health hazards, is significantly associated and enhances manifestations of workers safety and as such enhances outcomes such as workers evacuation, safety control measures, implementation of safety and job satisfaction. It was therefore recommended that health and safety systems be structured and designed to allow for flexibility, consistency and to also allow for feedback so as to enable updates and corrective measures.

Keywords: Occupational health, workers safety, waste management, chemical disposal

INTRODUCTION

Today, in most industrialized countries, the occupational health and safety standard for workers are still either weak or non-existent in many organizations. OSH also commonly referred to as occupational safety and health is an area concerned with the safety, health and welfare of the people engaged in work or employment. As pointed out by WHO "Occupational Health" deals with all aspects of health and safety in the work place and has a strong focus on primary prevention of hazards. While efforts are made to reduce hazards, these hazards remain present in the work place by nature of the profession. Occupational or work place hazard is dangerous to health, limb, or life that is inherent in or

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is associated with a particular occupation, industry or work environment. Rivers State with its population increase, strong urbanization, numerous industries especially the oil and gas industries, petro-chemicals as well as chemical industries, is faced with the problem of environmental waste management. The total and lack of effective regulatory framework on hazardous waste management policies is a concern that has made, for example, the country susceptible for the importation of waste materials into the country. The cases of the Koko dump, where in 1988, 3,500 tonnes of toxic waste from Italy were dumped is but one case. This incidence of Koko waste dump, as indicated by Olanipekun, Anibilow and Mundi (nd) "prompted and promoted" the promulgation of the harmful waste Special Criminal Provision act. decree 42, which, made it a criminal act punishable by life imprisonment, to carry, deposit, transport, import, sell, buy or negotiate in trade of harmful waste in Nigeria territory.

The Nigerian working environment over the years have become very challenging due to a number of verifiable facts such as lack of implementation of Labour laws, particularly on health and safety, sharp labour practices by multinational organizations, out dated legislations that have continued to negate international best safety practices. This is manifested in work place in the form of poor ventilations, lack of protective gears, excessive noise and poor lightening systems. Workers placed under these conditions mentioned above are prone to occupational health risk in the discharge of their duties.The increase in the nature of industrial activities have continued to generate huge disposable and in disposable waste in industrialized and industrializing nations. One of the many problems facing these nations is the issues of proper waste management. This has become a major concern for scholars in the field of waste management and occupational safety. For instance Oyesola andOdeku (2014) points to the fact that organization of the workplace should also provide proactive ways of evacuating the workforce and preventing neighbours from being injured in cases of workplace accidents and hazardous disasters.

ILO (2009) estimated that at least 250 million occupational accidents occurred every year worldwide, 33,500 0f the accidents are fatal resulting to death. In another study Ekram, Safaa, Sameh, Sana, Hanan, and Amira (2014) conclude thatWorkers exposed to chemical waste exhibit significant increase in risk of ill health. This is in relation to poor personal hygiene and self-care, inadequate protective and safety measures for potentially hazardous exposure. For concern is a study revealed by ILO (2003) and WHO (2013) which showed that overall occupational accident and disease rates are slowly declining in most developed countries. But in the position of Alli (2008) it is increasing in developing and industrializing countries. In United Kingdom for instance Health and safety executives (2000) estimated that about 500 people are killed every year and several hundred thousands are either injured or suffer work related ill health.

However, in a developing economy like Nigeria, accurate data on work place accidents and injuries are lacking. This stems from the fact that studies mention above have identified coherent reasons for work place accident, with identifiable

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data on numbers of casualties. However, this is lacking in Nigeria, where work related accidents are numerous, but data showing the numbers of incidents are lacking. This forms the basis for this study, to providing empirical data and examining the occupational hazards and safety control among waste management workers in selected waste management companies in Rivers state.

Aim of the Study

The aim of the study is to examine the impact of occupational health hazards on workers safety among selected wastes management companies in Rivers State. The specific objectives of the study are to:

Research Questions

i. What is the relationship between occupational health hazards and workers evacuation in chemical waste disposal companies?

ii. What is the relationship between occupational health hazards and safety control measures in chemical waste disposal companies?

iii. What is the relationship between occupational health hazards and implementation of safety in chemical waste disposal companies?

iv. What is the relationship between occupational health hazards and job satisfaction in chemical waste disposal companies?

Research Hypotheses

HO_1: There is no significant relationship between occupational health hazards and workers evacuation in chemical waste disposal companies

HO_2: There is no significant relationship between occupational health hazards and safety control measures in chemical waste disposal companies

HO_3: There is no significant relationship between occupational health hazards and implementation of safety in chemical waste disposal companies

HO_4: There is no significant relationship between occupational health hazards and job satisfaction in chemical waste disposal companies

LITERATURE REVIEW

Occupational Health and Safety (OHS)

Occupational health as defined by the joint committee of the ILO/WHO (1950) is the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupation. It is further explained as the sum total of all activities and programs that are engaged upon aiming to attain and maintain the highest level of health and safety for all people who are engaged in any type of work whatever. It involves the protection of worker health from any hazard to which they may be exposed to in the work environment. Occupational Health and Safety (OHS) is a preventive and proactive approach which involves risk assessment, hazard identification, hazard mitigation hazard elimination and treatment of work-related injuries.

However, there is a lot of hazards (Safety and health hazards) in which

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people are exposed to in their jobs, both in formal and informal industries. Exposure to these hazards occurs for fairly long hours on a daily basis as the majority of the active hours of the day is spent at work (at least 8 hours per day). These hazards include: chemical, biological, physical, mechanical, psychological and ergonomic hazards for any person affected, it could be either or a couple of the various forms of hazard.

Health and safety are inevitable in any organization or business. The reason is that the only time an employee will perform his duties is when the employee is in good health and he is sure of a safe working condition. Also, a good worker will perform his duties effectively only when he is sure that even when an accident occurs, he will be given a proper treatment and compensation. According to Goetzel (1991), improving employees health and safety practice at work, is directly related to their productivity and profitability of organizations. Also, Oxenburgh et al (2004) argued that "the health and safety of all employees is closely linked to the company's productivity in all work places.

Providing workers with a safe and healthy work environment, free from physical, chemical, biological and radiological hazards inherent in a particular industry sector, is essential for ensuring the long term sustainability of the organization and operations. A company is required to implement all reasonable precautions to prevent accidents, injury and illness of workers in the course of performing their duties. This includes following industry specific workers safety standards and implementing preventive and protective measures to.

The Development and State of Health/Safety in organization: The Nigerian Perspective

Occupational health practice as reviewed by Asuzu (1996) was originated in Europe following the systematic work of BernadinoRamazzini in Italy at the turn of the 17th century – it grew mostly under the notion of industrial health, concentrating on the chemical, mechanical and social conditions of labourers as well as the work of the arts and trade, until the work of Charles Turner Thackrah in Britain broadened its understanding to include the professions and certain civic ways of living. The health and safety in industries in Nigeria have however not been in anyway adequate from studies in that area, especially among the indigenous small and medium sized companies.

This code was put in its final form in 1949, and was placed at the disposal of governments and industries for guidance in framing or revising their own safety regulations. Nigeria, as a member of the international labour organization ratified and adopted the relevant international labour organization convention, and in 1955, enacted "an ordinance to make provision for the health, safety and welfare of persons employed in factories and other places. However, the ordinance came into force on 1st September, 1956. It became the chapter 66 of the laws of the federation of Nigeria and Lagos in force on the 1st June, 1958. When it was later reviewed 1987 with a commencement date of 11the June, 1987; it is currently the factories Act, 1990.

Environmental Legislations/ Standards/Compliance

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Environmental legislations are laws made to guide individual and industrial interactions with the environment to avoid the pollution of the environment. In Nigeria, the petroleum act of 1969 generally empowers these laws. It was the first enabling act for environmental control in Nigeria.To ensure full compliance with the laws as provided by the petroleum act (1969), the Department of Petroleum Resources (DPR) was instituted by decree no 33 of April 1st 1977 to monitor the operations of the exploration and production companies. The tool used by DPR to ensure compliance is the "environment guidelines and standards for the oil industry in Nigeria" published in 1992. However there was another body, the federal environmental protection agency (FEPA) enabled by decree no 58 of 1988. FEPA used to legislate for industrial operations in Nigeria as a whole. Presently, however FEPA has been scraped and in its place thefederal ministry of environment was instituted in 1999. However most of the policy goals, strategies for implementation etc. are still in place. To enable their performance the federal ministry of environment and DPR have instruments in place which companies are required to comply with. These instruments are referred to as standards & regulations.

Similarly, Adesanya (1997) added that, industrial hazard such as air pollutants which abound in various forms in many areas and cities especially the industrial centres have components in form of particular matters and gases. They affect not only the health of man, but also other creatures and vegetation in the environment. They also have irritating effects upon the eyes and skin as well as upon the respiratory tracts.According to Herper (1999), health risk from industrial activities can occur through direct physical injury from accidents during industrial operation, acute chemical poisoning in the work place or surrounding and long-term exposure to chemicals released into the general environment. David (2005) added that dusts from industrial production constitute the pollution which are composed of toxic chemical concentrations that usually affect man, resulting to respiratory and skin diseases.

WHO, 1996 also added that the major factors accounts to urban air quality deterioration are growing industrialization and increasing industrial emissions. Moreover, a study carried out by WHO revealed that 84 deaths were directly attributed to outdoor air pollution in Indian Cities, at the same time indoor air pollution accounted for 496, 000 deaths in villages and 93,000 deaths in cities (WHO, 1997). Okorie (1988), stated that exposure to atmospheric pollutants is a source of health hazard. He postulated that injury to health from atmospheric or air pollution in a developing country like ours is of course a phenomenon of urbanization and industrialization and not a part of rural living. In chronic disease conditions, alteration of physiologic function may occur especially among sensitive groups such as and sufferers of respiratory and heart disease. Examples of episodes of acute air pollution resulting from accidental discharges of industrial processes which were characterized by sudden death include that of Los Angeles, United States of America in 1955; Meuse Vallevy in Belgium 1930; Pennyslvania U.S 1948, London, U.K 1952; Sevego Milan Italy 1976 and the union carbide explosion in India 1979.

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Udoh (1990) also added that radiation in high doses causes somatic and genetic defects in man. The somatic damage may appear as skin damage, eye contracts, liver damage, spleen and thyroid damage and reduced fertility. Exposure to environmental contamination also influences nutritional needs of the individual. Other effects associated with radiation include leukemia or uncontrolled growth of cancerous cells in the body. While the genetic damage appears in the offspring as mutations, they may become hereditary. Two Japanese cities of Hiroshima and Nagasaki are typical examples. He further posited that noise especially above 80 – 85 can cause ear damage and temporary or even permanent hearing loss. Other levels of noise can cause decreased heart rate, vibration in blood pressure or breathing difficulties. Others include fatigue, emotional stress, hypertension, colitis and ulcer.

METHODS

Research Design: The survey research design was adopted in this study. This research strategy focuses on the use of question-based or statistical tools to collect information about how people think and act.

Population of the Study: The study population is the entire staff of the four (4) selected chemical waste disposal companies in Rivers State, that are directly working at the disposal units. The total population size is 413 workers from the four (4) waste management companies. The population is confined to only staff working directly in the chemical disposal units of the selected waste management companies.

Sample Size Determination: The sample size was determined using the Taro Yamane 1970 sampling formula based on the numbers of staff working directly at the chemical disposal units of the waste management companies. They exclude staff working in other units of the firms. The reason for choosing the population and size from the staff working directly under the chemical disposal units is that they are directly affected and come in contact with the disposal of the chemical wastes in the field. Hence, they provided first-hand information on their activities on field. This study therefore utilizes the Taro Yamane 1970 sampling formula in its decision on an appropriate size for representing the adopted population. An error precision value of 0.05 is adopted in calculating the sample size given the adoption of a confidence interval of 95%. Hence, the sample size for this study is 203 workers to be selected from the four chemical waste disposal companies in Rivers State.

DATA RESULTS

Demographic Data Analysis

The result for the analysis on the demographic data is presented in this section; analysis at this level entailed simple frequencies statistical analysis using the bar chart; this is as a result of the discrete characteristic of the variables of the study. The demographic analysis aimed at ascertaining the distribution of the participants of the study through selected characteristics such as the frequencies for their gender of the participants, qualification of the participants, marital status, religion and status or nature of respondents' employment with the organization.

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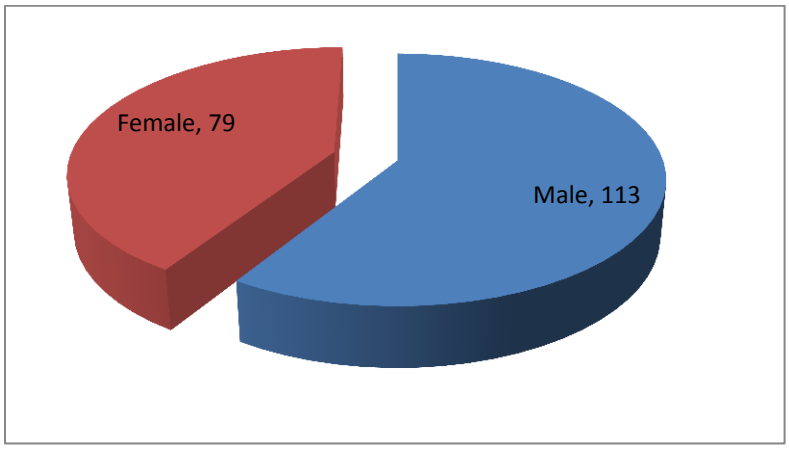


Figure 1 Gender distributions for the study

Gender (sex) of respondents: Table 1 depicts the distribution for the frequencies of the gender distribution of the participants of the study. The data reveals that a higher number of the participants are male (113) and are in the majority as compared to their counterparts who are female (79)

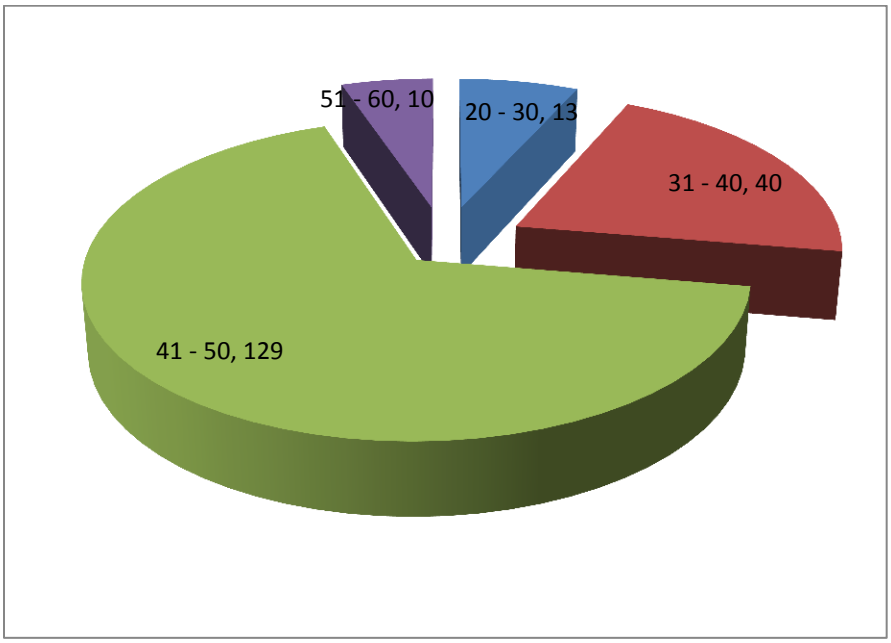


Figure 2 Age distributions for the study

Age of respondents: Table 2 depicts the age distribution for the frequencies of the members of the organization. The data indicates that a higher number of the participants are between the ages of 41 – 50 years (129), followed by those between the ages of 31 – 40 years (40) and then those between the ages of 20 – 30 years (13) and finally those between the ages of 51 – 60 years (10)

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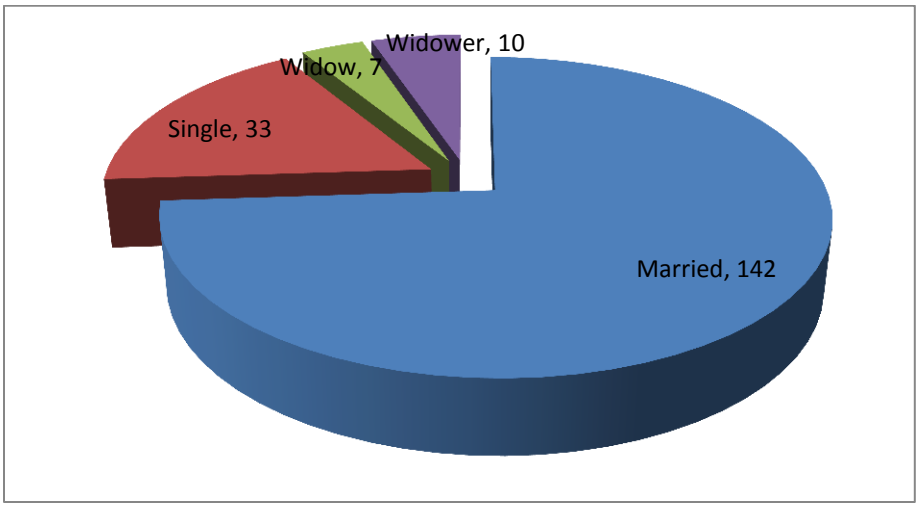


Figure 3 Status distributions for the study

Marital status of respondents: Table 3 depicts the distribution for the frequencies of the participants based on their marital status, where it was observed that most of the participants are married (142) in comparison with those who are still single (33), followed by the category for widowers (10) and finally the category for widows (7).

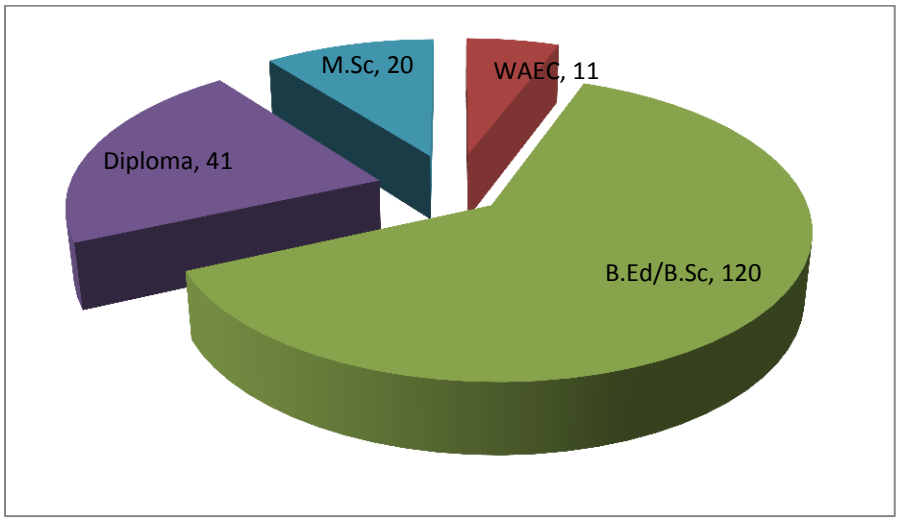


Figure 4 Education distributions for the study

Education of respondents: Table 4 depicts the distribution for the frequencies of the participants based on their educational qualifications, where data revealed that a majority of the participants had attained first degree qualifications (120) followed by those with diploma qualifications (41), next, the category for those M.Sc. qualifications (20), then those with WAEC qualifications (11). The FSLC and PhD categories both have no frequencies (0).

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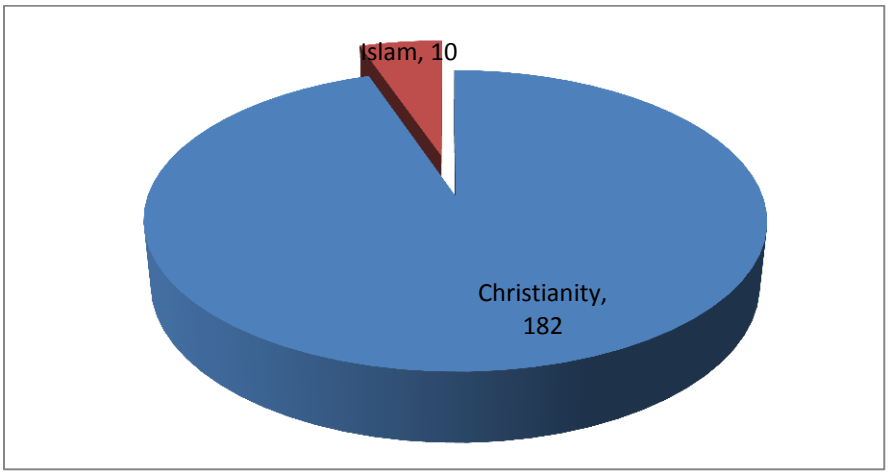


Figure 5 Religion distributions for the study

Religion of respondents: Table 5 depicts the religion distribution for the frequencies of the participants of the study. The data indicates that a higher number of the participants are Christians (182), followed by those who are of the religion of Islam (10). The category for Traditional and none form of religion both have no frequencies (0).

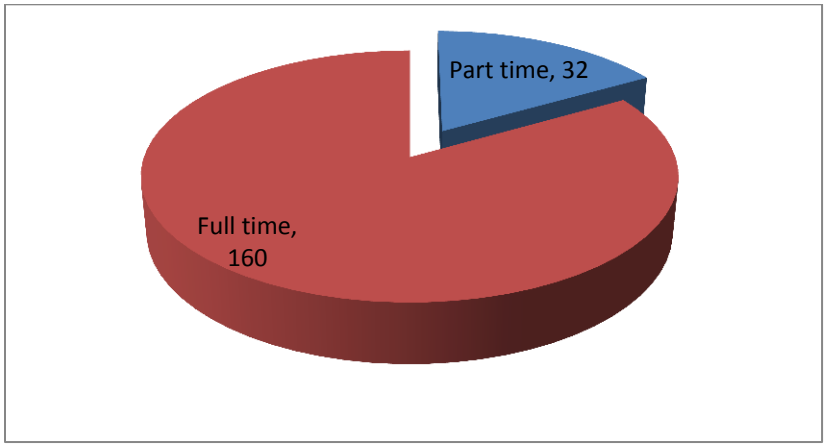


Figure 6 Religion distributions for the study

Employment type of respondents: Figure 6 depicts the distribution for the frequencies of the participants based on the type of their employment within their various organizations. The data reveals that a higher number of the participants are full time staff (160) followed by staff who have been employed on a part time basis (32). The frequency for the category of contractor staff is zero (0).

Primary Level of Analysis

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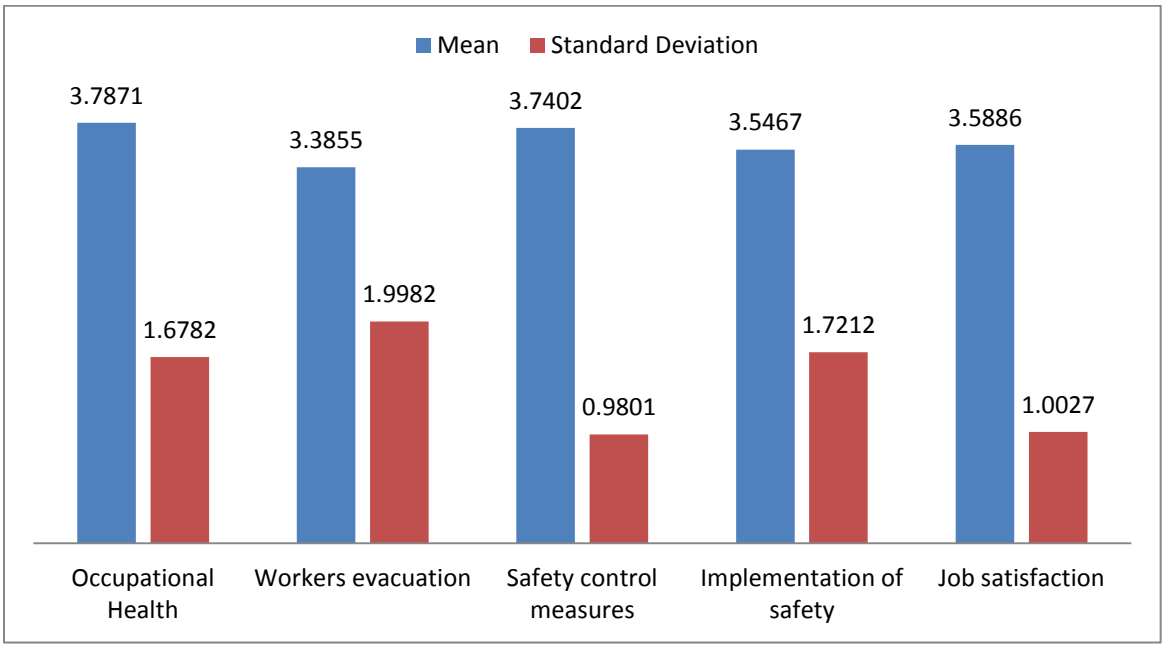


Figure 7 summaries for the distributions for the variables of the study

Presented in figure 7 is the summary for the distribution of the variables of the study. The evidence indicates that all five variables of the study are well manifested within the framework of the selected chemical waste disposal companies.

Secondary Level of Analysis

In this section, the result for the analysis on the null assumptions of significant bivariate associations between the predictor variable – occupational health hazards and the measures of the criterion variable – workers safety (workers evacuation, safety control measures, safety implementation and job satisfaction) is presented. The Spearman's rank order correlation coefficient is adopted in the tests for the associations at a 95% confidence interval for the two-tailed (non-directional) tests implying a 0.05 level of significance. The decision rule is based on the adoption of the Probability (P) value where a $P < 0.05$ region holds for significance thus a rejection of the null hypotheses while a $P > 0.05$ region holds for insignificance thus an acceptance of the null hypotheses. Table 4.7 illustrates the result for the tests for the six hypothetical assumptions.

Table 1 Occupational health hazards and workers evacuation

			Health	Evacuation
Spearman's rho	Health	Correlation Coefficient	1.000	.628**
		Sig. (2-tailed)	.	.000
		N	192	192
	Evacuation	Correlation Coefficient	.628**	1.000
		Sig. (2-tailed)	.000	.
		N	192	192

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**. Correlation is significant at the 0.01 level (2-tailed).

The relationship between occupational health hazards and workers evacuation: The tests for the association between occupational health hazards and workers evacuation reveals that there is a significant relationship between the variables (correlation coefficient = .628; and P < 0.05). The evidence suggests that occupational health hazards within the organizations significantly impacts on workers evacuation. As such, the null hypothesis of no significant relationship is rejected.

Table 2 Occupational health hazards and safety control measures

			Health	Control
Spearman's rho	Health	Correlation Coefficient	1.000	.711**
		Sig. (2-tailed)	.	.000
		N	192	192
	Control	Correlation Coefficient	.711**	1.000
		Sig. (2-tailed)	.000	.
		N	192	192

**. Correlation is significant at the 0.01 level (2-tailed).

The relationship between occupational health hazards and safety control measures: The tests for the association between occupational health hazards and safety control measures reveals that there is a significant relationship between the variables (correlation coefficient = .711; and P < 0.05). The evidence suggests that occupational health hazards within the organizations significantly impacts on safety control measures. As such, the null hypothesis of no significant relationship is rejected.

Table 3 Occupational health hazards and implementation of safety

			Health	Implementation
Spearman's rho	Health	Correlation Coefficient	1.000	.691**
		Sig. (2-tailed)	.	.000
		N	192	192
	Implementation	Correlation Coefficient	.691**	1.000
		Sig. (2-tailed)	.000	.
		N	192	192

**. Correlation is significant at the 0.01 level (2-tailed).

The relationship between occupational health hazards and implementation of control: The tests for the association between occupational health hazards and implementation of control reveals that there is a significant relationship between the variables (correlation coefficient = .691; and P < 0.05). The evidence suggests that occupational health hazards within the organizations significantly impacts on the implementation of control. As such, the null hypothesis of no significant relationship is rejected.

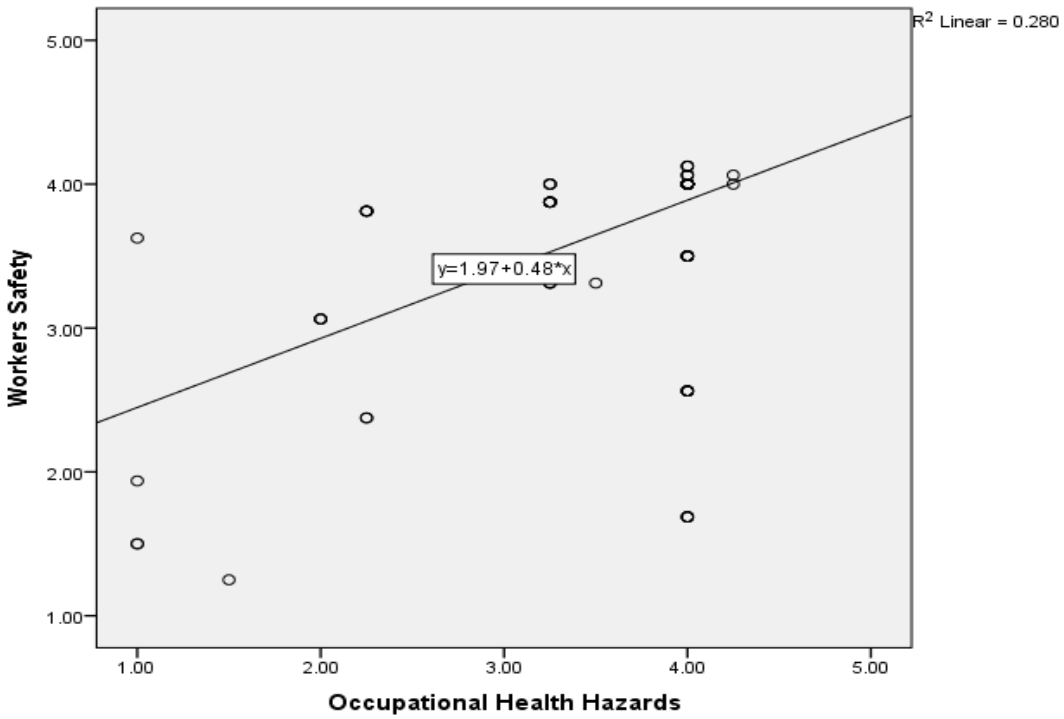
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Table 4Occupational health hazards and job satisfaction

			Health	Satisfaction
Spearman's rho	Health	Correlation Coefficient	1.000	.575**
		Sig. (2-tailed)	.	.000
		N	192	192
	Satisfaction	Correlation Coefficient	.575**	1.000
		Sig. (2-tailed)	.000	.
		N	192	192

**. Correlation is significant at the 0.01 level (2-tailed).

The relationship between occupational health hazards and job satisfaction: The tests for the association between occupational health hazards and job satisfaction reveals that there is a significant relationship between the variables (correlation coefficient = .575; and P < 0.05). The evidence suggests that occupational health hazards within the organizations significantly impacts on the job satisfaction of the workers. As such, the null hypothesis of no significant relationship is rejected.



Presented in figure 8 is the scatter diagram depicting the summary relationship between the variables of the study

Discussion of the Findings

The findings of this study reveal that there is a substantial and significant relationship between occupational health

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hazards and workers safety in the examined waste management companies. The evidence presented herein reiterates the position previous research (Barbara, 1993) with reference to the implications of occupational health hazards on the affairs and relationship within organizations. Chris (2001) in his argument, emphasized on the structuring and integration of systems within the organization in such a way that it provides both preventive and control measures with regards to hazards at the workplace. These assertions are further corroborated by the findings of this study which provides evidence of the significant relationship between occupational health hazards and the measures of workers safety (workers evacuation, safety control measures, implementation of safety and job satisfaction).

The implications of this finding follows that the extent to which workers safety can be considered as effective or substantial is hinged not just on the processes or systems which are in place, but also on the evidence of the satisfaction of the workers with such established systems or control measures within the organization. The position of this study on the role of occupational health hazards as being a substantial antecedent and predictor of the safety of the workers, resonates the view of Achalu (2009) who even identified health hazard management features such as workers screening, daily feedback on system functionality, and units monitoring thereby hinting on the need for effective systems integration, cohesion and maintenance.

Given the empirical evidence presented by the findings of the study, the implications follow that contrary to the opinion of the Asuzu (1992) which identifies poor workers attitudes and inexperience in handling equipment as being a primary antecedent of incidences of hazard within the workplace, this study affirms that most hazards are as a result of poor management systems and instituted control measures against occupational health hazards. The poor management and lack of integration between units is also supported herein as another major reason why hazards can be considered as being significant or high within organizations.

Furthermore, with regards to the findings of this study provides evidence which significantly connects organizational systems and processes to behavioral outcomes such as job satisfaction. The evidence from the analysis suggests that workers interest and contentment with their occupations can also be necessitated by their observations or experiences of security or safety systems within the workplace which serve as checks on the facilities and provide safeguards for the wellbeing of the worker. The evidence supports Achalu's (2009) observation that the behaviour and attitudes within organizations are basically as a result of the ability of management to identify and address the interest as well as expectations of the workers and to also institute fundamental structures and frameworks which offer safeguards and security for workers within the organization. In his observation, he identifies other factors such as job security, tenure, and compensation as being significant in enhancing workers sense of security and continuity with the organization.

The major premise of this study therefore lies in its support, identification with and confirmation of theories and assertions (Oyesola&Odeku, 2014; Chris, 2001)

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which affirm to the role of occupational health hazards as being a significant antecedent to workers safety (workers evacuation, safety control measures, implementation of safety and job satisfaction) in selected waste companies. Furthermore, the position of the study based on the evidence presented in its empirical data affirms support for the position (Hamalainen, et al 2006; Somers & Somers, 1984; Achalu, 2009) that the manifestations of occupational hazard management systems is a significant antecedent of the behaviour and satisfaction of workers.

CONCLUSIONS

The conclusions of this study are based on the empirical evidence of its investigation of the relationship between the variables of the study as well as the summary of its findings, hence, the study concludes as follows:

i. There is a significant relationship between occupational health hazards and workers evacuation in the selected chemical waste disposal companies in Rivers State. The evidence suggests that the modes and patterns of evacuation are basically an outcome of the designs of the health hazard management systems of the organizations.
ii. There is a significant relationship between occupational health hazards and the safety control measurement of workers in the selected chemical waste disposal companies in Rivers State. Occupational health hazards is observed herein to contribute substantially and to enhance the safety control measures of the organizations
iii. There is a significant relationship between occupational health hazards and the implementation of safety within the chemical waste companies examined by this study. This is as occupational health hazards is observed to have a substantial effect on the safety implementation processes and formats of the organizations
iv. There is a significant relationship between occupational health and the job satisfaction of the workers in the selected chemical waste disposal companies identified in this study. This is as occupational health hazards are observed to have a substantial effect on the satisfaction of the workers.

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