

OCCUPATIONAL HAZARDS AND SAFETY MANAGEMENT SYSTEM AMONG SMALL AND MEDIUM SCALE ENTERPRISES IN PORT HARCOURT METROPOLIS, RIVERS STATE

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Abstract: This study investigated the occupational hazards and safety management system among small and medium scale enterprises in Port Harcourt metropolis, Rivers state. The descriptive, cross-sectional design was used for the study. The population of the study comprised of a total of about four thousand two hundred and twenty two (4,222) SME Operators, with a sample size of six hundred and sixty (660), comprising four hundred and forty (440) conventional SME workers and two hundred and twenty (220) SME operators/Manager/HSE officer which was determined using the Taro Yamane formula, and selected using the non-proportionate stratified random sampling technique. A structured questionnaire was used for data collection and analysis was done using frequency, percentages, mean and standard deviation for research questions and Z-test, one-way analysis of variance (ANOVA), Multiple Regression analysis for test of hypotheses. The finding of the study showed that there was a significant difference in exposure to occupational health hazards of SME workers in Port Harcourt based on age [$F(3, 392) = 7.33; p > 0.05$]; there was significant difference in the level of SME workers exposure to occupational health hazards based on gender [$Z(-4.348); p > 0.05$]; amongst others. The study concluded that the least hazards prevalent among SMEs were biological hazards and chemical hazards. Based on the findings of the study, it was recommended that government should become more proactive in implementing OHS legislations on industries especially agricultural and ICT industries by designing enforcement programmes to help protect the lives of millions of Nigerians working in these sectors, as well as to improve the productivity of this set of workers, amongst others.

Keywords: Occupational hazards, safety management system, small and medium scale enterprises, Port Harcourt metropolis.

1. INTRODUCTION

Background to the Study

According to the World Health Organization (WHO, 2013), more than three billion people in the world have daily occupational health needs that can only be met by providing occupational health services (OHS) to workers and workplaces, and it has been established that SME workers account for a vast majority of the total workforce in every country of the world. It is important to improve occupational health service systems and infrastructures, and provide occupational health

services for all, as emphasized by International Labour Organization (ILO) Convention No 161 on Occupational Health Services, the WHO Global strategy on occupational health for all, and most recently, the United Nations (UN) Sustainable Development Goals (SDGs).

Many research findings agree to the fact that small and medium enterprises (SMEs) sector is a key engine to economic growth and development in developing nations. This sector is responsible for most of the advances in new products and process, provides most of the employment opportunities but is also a key indicator of the overall performance of an economy. The Small and Medium-scale Enterprises Development Agency of Nigeria (SMEDAN) and National Bureau of Statistics (NBS) collaborative survey on Micro, Small and Medium Enterprises (MSMEs) in 2013 point to the significance of small and medium enterprises for the growth, productivity and competitiveness of economies of developing countries. According to SMEDAN, not only do SMEs provide employment and income for the bulk of the population, they are a primary source of new jobs and are acknowledged as critical breeding and nurturing grounds for domestic entrepreneurial capacities, technical skills, technological innovativeness and managerial competencies for private sector development in Nigeria.

There is growing evidence that those working in SMEs are more frequently exposed to hazardous situations and suffer more work-related injuries and illnesses than those working in large businesses (Clifton, 2000; Targoutzidis *et al.*, 2014). However, data available for analyzing the influence of enterprise size on injuries and illnesses are poor, making 'analysis-by-size' difficult. The challenge of establishing the national injury/illness burden contributed by SMEs is even harder, because it is likely that there is more under-reporting from smaller enterprises than larger ones. In addition, there is often a focus on injury and fatality, with less emphasis on ill-health and diseases, for which data for SMEs are commonly lacking (Legg *et al.*, 2009). Health is an important pre-requisite for a successful private and social life and participation in work, as posited by the International Commission on Occupational Health (ICOH) global survey on occupational health services for all. ICOH further buttress that in addition to occupational accidents, a silent epidemic of work-related diseases (WRDs) has been recognized. Stating that the early origins of this new concept lie in the Report of the WHO Expert committee from 1985 (WHO Technical Report series 714, Geneva, 1985). Since then, the importance and scale of occupational and work-related morbidity has been researched and found to have a global epidemic scale; the most recent estimates speak of 2.4 million fatal work-related diseases annually in the world. This is six times the number of fatal occupational accidents, and the morbidity from non-fatal WRDs is one or two orders of magnitude higher.

One problem with developing nations is bad data keeping. Poor data keeping culture makes the extent of the effects of hazards hard to measure. There are many countries that cannot produce basic data on safety statistics. If these data are not available, it may be hard to trace where there are safety hazards and appropriately tackle them. It is even worse in the Small and Medium-scale Enterprises which is one of the least organized sectors of the economy of developing countries like Nigeria with very bad data keeping system (Umeokafor, Evaggelinos, Lundy, Isaac, Allan, Igwegbe, *et al.*, 2014). Progress in generating Occupational Health and Safety data in the SME sub-sector in the industrializing countries has been painfully slow over the years. In the poorest countries, there has been no progress at all. The majority of occupational illnesses are occurring almost exclusively in the developing countries (Petro, 2017).

Due to the nature and frequency of occupational injuries and diseases prevalent among workers in the informal sector including small and medium enterprises, Rafei (2004) advocated increasing governmental and regulatory bodies' attention to the matters of occupational health and safety in small and medium enterprises. He noted that the absence of legislative, administrative and technological provisions for the sector account for the volume of lost time injuries and avoidable casualties recorded from year to year. The International Labour Organization sponsored study conducted and reported by Comaru & Werna (2013) examined the health and safety related issues in the informal sector enterprises and recommended safe practices that can enhance the health status of urban workers in the informal sector and small and medium enterprises which form an important part of human capital development. They further posited that work and the working environment should be pro-health and not detrimental to the health and wellbeing of the worker. This is because work can have an irrefutable impact on individuals, their families and society, as it is a source of income and material output which supply for the necessities of life. However, other studies suggest that work can also be seriously detrimental to employees' health and safety (e.g. Cox, Griffiths & Rial Gonzalez, 2000; Leka & Andreou, 2012). Thus, in pursuing the goal of health at work, it is vital to uphold standards and practice level so as to shield workers' health and safety and block possible negative impact resulting from unfavourable working conditions (Leka & Andreou, 2012).

Occupational Health and Safety practices are concerned with protecting employees and other people affected by what the company does and produces. Safety practices serve to prevent accidents and so reducing the subsequent loss and damage to people and their property. They relate more to systems of work than the working environment; Health and Safety practices are concerned with protection of workers against hazards (Armstrong, 2012). ISO 14001 (International Standards Organization 14001) provides the framework for performance improvement, control and directional compliance as well as demonstrates commitment to stakeholders. The laws which relate primarily to safety of workers are covered mainly under the occupational health laws. As ISO 14001 is not regulatory but voluntary, not all organizations aim to achieve it, possibly as a result of costs. This is especially so with small scale enterprises (Edmund, 2015).

Hazards in the workplace can jeopardize the health of workers especially those workers who are ignorant of the existence and adverse effects of such hazards. Exposure to such hazards, either long-term or short-term, may predispose workers to acute accidents, occupational diseases or chronic health risks in the long-run. According to Prashar and Bansal (2010), occupational hazard refers to a potential condition which might be converted into an event (accident). The Navy and Marine Corps Public Health centre, in 2010 defined a hazard as a source of danger that has the ability to cause injury or harm. Occupational hazards are dangers to human health and well-being which are associated with specific occupations.

While efforts are being made to reduce hazards to the barest minimum, these hazards remain present in the workplace by nature of the profession (WiseGEEK, October, 2013). Occupational or workplace hazard is a danger to health, limb, or life that is inherent in, or associated with a particular occupation, industry or work environment. It includes risk of accident and of contracting occupational or work-related diseases (Business Dictionary.com, October, 2013). While at work, people face a variety of health hazards almost as numerous as the different types of work, including chemicals, biological agents and adverse ergonomic conditions etc.

A critical look at hazard exposure reveals that accident and physical and chemical agents are the main problems in manufacturing industries, while pesticides and organic dusts, heavy physical workload, biological factors and accidents are the occupational burdens of agricultural workers. A number of studies show that in the worst conditions, 50-100% of the workers in some hazardous industries may be exposed to levels of chemical, physical and biological factors that exceed the occupational exposure limits applied in the industrialized countries (Muhammad, 2013).

Furthermore, it has been reiterated severally that human behaviour is often time modified or influenced by social, economic and demographic variables such as education, income/resources, political structure, age, experience, gender amongst others. Similarly, such could also be said about the practices of occupational health and safety among SMEs (Mwawasi, 2012). However, there is still ongoing argument as to what extent and how these variables are associated or related to the implementation of OHS-MS among SMEs as well as the extent to which they determine hazard exposure and the adoption of hazard control strategies.

Gender is one of the individual factors contributing to occupational injury. A review of 16 studies showed that the injury risk of males was 3.3 times higher than that of females. The injuries of men were often more serious, as the risk of a fatality is 13 times higher for males than for females in nine studies (Salminen, Saari, Saarela, & Rasanen, 1992). However, the sex ratios for fatal occupational injuries decreased substantially in the US and Italy from 1955 to 1995 (Waldron, McCloskey, & Earle, 2005). The gender difference in occupational injuries is mostly explained by the lower proportion of females in high-risk industries. However, females in heavy manufacturing were more often involved in injuries than their male counterparts (Taiwo et al., 2009).

Age as well can have a profound influence on safety behaviour. A review of 63 non-fatal studies showed that young employees have a higher injury rate than older workers. However, the injuries of young employees were less serious, because their fatality rate was lower than that of older employees (Salminen, 2004). A later review with nine cross-sectional studies showed that work injuries of young employees varied with hazard exposure, perceived work overload and job (Breslin et al., 2007). Night shifts in particular increased the risk of injury among young employees (Horwitz & McCall, 2005), and mother's education contributed strongly to the injuries involved of young workers (Rauscher & Myers, 2008). Older employees have a lower injury rate than younger ones among Ghanaian industrial workers (Gyekye & Salminen, 2009a).

There is increased research interest in identifying the contribution to injuries and accidents from enterprises having different sizes – an acknowledgement of the fact that size matters in OHS management (Micheli and Cagno, 2010; Sørensen et al., 2007). Micheli and Cagno (2010) argue that it is important not just to look at SMEs in relation to the nature of the accident burden but to divide SMEs into different size categories. They showed that there were differences between occupational health and safety (OHS) performance of micro enterprises (less than 10 employees), small enterprises (between 11 and 50 employees) and medium enterprises (between 51 and 250 employees). The differences were between micro enterprises and the rest for average lost time days due to accidents, with the same pattern for frequency of severe accidents. Their findings emphasize the importance of identifying business size in OHS studies.

Finally, no research is complete without theoretical foundations. This study which is focused on occupational hazards, hazard control measures (HCM) and occupational health and safety management system (OHS-MS) is quite linked to several cause and effect theories, especially those expressing accident causation and mitigation. In this knowledge, the theoretical evidence supporting the study are numerous but was limited to three workplace safety theories comprising ABC theory of accident, Domino theory of corrective actions and entropy theory of accidents causation. While the propositions of these theories differ slightly, all agree that hazard is inherent in every industry and because human health is important, every organization should always make effort to protect their workers from hazard exposure in order to ensure their health and well-being and this is especially expedient in the small and medium-scale enterprises.

Statement of the Problem

Small-scale industries and service enterprises often have few resources, heavy workloads and multiple tasks for each worker. Work usually takes place in an environment that does not always meet required standards. Family members of the entrepreneurs and workers, including children and pregnant women and elderly people share the work in small scale enterprises such as home industries, small farms and cottage industries, particularly in developing countries like Nigeria. It has been estimated that two-third of the workers of the world still work in conditions that do not meet the minimum standards set by International Labour Organization (ILO).

While developed countries are seen as being more stringent about workplace safety; because of the value placed on human life and the need to optimize safety, the developing countries do not take safety seriously or they have insufficient resources and regulatory frameworks enforce compliance to existing OHS legislation especially in Small and Medium-scale Enterprises.

More so, developing countries have a very unbearable level of “I don’t care” attitude towards occupational health and safety both at organizational and individual levels. So, SME workers are even more at risk of occupational hazards and exposed to agents of diseases including physical, biological, and chemical hazards. Mechanical and psychosocial hazards have also been prominently reported amongst SMEs the world over. But the situation of Port Harcourt, Rivers State is quite unknown at the moment, which is the gap this study intends to fill.

There is an obvious lack of coordinated occupational health and safety regulations and practice among SMEs in Port Harcourt metropolis, where skirmishes of unreported work-related accidents and attendant injuries/illnesses are constant occurrences at work sites and business places. A walk through survey embarked upon by the researcher revealed a noticeable poor safety culture among most SMEs in Port Harcourt metropolis. Hence, the need to carry out this study in order to ascertain the Occupational health and safety status of SMEs in order to create the needed awareness among SME operators and the teeming workforce.

More seriously, a diligent search of various online resources revealed the dearth of information on SMEs in Port Harcourt metropolis, showing that not much has been done on occupational health and safety among SMEs in Rivers despite the margin of employment by this important sub-sector of the state economy. Most of the available researches, policies and legislations on occupational health and safety and the work environment has been and still is, mainly based on large enterprises. And yet, there are growing evidence that SME workers in Port Harcourt metropolis are more frequently exposed to hazardous situations and suffer more work-related injuries and illnesses than those working in large businesses. This is the rationale for carrying out this study in this area, to investigate this assertion.

Aim and Objectives of the Study

The aim of the study was to investigate occupational hazards and safety management system among small and medium scale enterprises in Port Harcourt metropolis, Rivers state. Specifically, the objectives of the study were to:

1. Determine the prevalence of occupational hazards among SME workers in Port Harcourt metropolis;
2. Find out the extent of exposure to occupational hazards based on age of SME workers;
3. Ascertain the extent of exposure to occupational hazards based on gender of SME workers;
4. Find out the types of occupational hazards most common to each SME sub-sectors;

Research Questions

The following research questions were formulated to guide the study.

1. What are the occupational hazards among SME workers in Port Harcourt metropolis?
2. What is the extent of exposure to occupational hazards among SME workers in Port Harcourt metropolis based on age?
3. To what extent is exposure to occupational hazards among SME workers in Port Harcourt metropolis based on gender?
4. What are the most common types of occupational hazards found in each SME sub-sector?

Hypotheses

The following hypotheses were postulated to be tested at 0.05 alpha level.

1. There is no significant difference in exposure to occupational hazards among SME workers in Port Harcourt metropolis based on age.
2. There is no significant difference in exposure to occupational hazards among SME workers in Port Harcourt metropolis based on gender.
3. There is no significant difference between the prevalence of occupational health and safety management system and the SME business types.

2. CONCEPTUAL REVIEW

Concept of Occupational Health and Safety

Generally, there is no single definition of occupational health and safety that has won the acceptance of all and sundry. Rather, there are as many definitions of OHS as there are OHS experts. Thus, different definitions abound in the literature. For example, Occupational Health is defined by the Joint Committee of International Labour Office and the World Health Organization as “the promotion and maintenance of the highest degree of physical, mental well-being of workers in all occupations and places of employment (Lukas et.al, 1997). Also, Keitany (2014) defined Occupational health and safety (OHS) as the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment (Lamm, 2000). Similarly, Ali (2008) in the preamble to second edition of fundamentals of Occupational health and safety (OHS) defined it as the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment.

Occupational Hazards Exposures in SMEs

In the preceding subheading, the meaning of OHS was described as the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment. Central to this definition is the idea of controlling hazards in the work environment to promote health of workers. This simply means that hazard is the ugly component of the work environment that causes harm to workers and other subjects around the environment.

Occupational hazard is defined as a work material substance, process or situation that predisposes to disease or accident, or can directly cause disease or accident to workers in the workplace, and even years after the workers might have left the workplace (Asuzu, 2002). Hazard is the intrinsic property or potential of a product, process or situation to cause harm, adverse health effects on someone or damage to something. In other words, hazard is the potential to cause harm, ill-health or injury, damage to property, plant, products or the environment, production losses or increased liabilities. A hazard is further understood as any source of potential damage, harm or adverse health effects on something or someone under certain conditions at work. Examples of hazards are hydrocarbons under pressure, objects at height, electricity, toxic substances, noise, radiation and working at heights. The Navy and Marine Corps Public Health centre, (2010) defined a hazard as a source of danger that has the ability to cause injury or harm. Occupational hazards are dangers to human health and well-being which are associated with specific occupations.

Physical Hazards: Physical hazards are often said to be less important than chemical hazards but this is not so. They can and do cause several health problems, injuries or even death. The nature of physical agents is wide and should not be underrated but the main ones capable of causing occupational disorders and injuries are noise, illumination, vibration, radiation (ionizing and non-ionizing), microclimatic conditions in the case of extreme heat and cold. (WHO, June 2013)

Chemical Hazards: About 100 000 different chemical products are in use in modern work environments and the number is growing. High exposures to chemical hazards are most prevalent in industries that process chemicals and metals, in the manufacture of certain consumer goods, in the production of textiles and artificial fibres, and in the construction industry. Chemical hazards could be classified into: Particles, (such as fibres, fumes and mist: Carbon Black, Welding Fume, Oil Mist), metals and metalloids (such as Arsenic, Cadmium, Chromium, Mercury, Zinc), organic, solvents and compounds (such as Acetone, hydrocarbons, Benzene), inorganic gases: (Carbon monoxide, Hydrogen sulphide, Sulphur dioxide).

Biological Hazards: Exposure to some 200 biological agents, viruses, bacteria, parasites, fungi, moulds and organic dusts occurs in selected occupational environments. The hepatitis B and hepatitis C viruses and tuberculosis infections (particularly among healthcare workers), asthma (among persons exposed to organic dust) and chronic parasitic diseases (particularly among agricultural and forestry workers) are the most common occupational diseases resulting from such exposures.

Psychosocial Hazards: Psychosocial hazards comprises of the psychological and social hazards. Psychological hazards are caused when time and a work pressure has become more prevalent during the past decade. Monotonous work, work that requires constant concentration, irregular working hours, shift-work, and work carried out at risk of violence (for example, police or prison work), isolated work or excessive responsibility for human or economic concerns, can also have adverse psychological effects.

Mechanical and Ergonomics Hazards: unshielded machinery, unsafe structures in the workplace and dangerous tools are some of the most prevalent workplace hazards in developed and developing countries. In Europe, about 10 million occupational accidents happen every year (some of them commuting accidents). Adoption of safer working practices, improvement of safety systems and changes in behavioural and management practices could reduce accident rates, even in high-risk industries, by 50% or more within a relatively short time.

Control of Occupational Hazards in SMEs

The incidence of accidents and work-related diseases and injuries in most occupational sectors is still regrettably high; there is therefore an urgent need for preventive and protective measures to be instituted at workplaces in order to guarantee the safety and health of workers. Occupational accidents and diseases not only cause great pain, suffering or death to victims, but also threaten the lives of other workers and their dependants:

Elimination: Elimination involves physically removing the hazard from the workplace. This is the most effective hazard control measure. For example, if employees must work high above the ground, the hazard can be eliminated by moving the piece they are working on to ground level to eliminate the need to work at heights.

Substitution: This is the second most effective hazard control which involves replacing something that produces a hazard (similar to elimination) with something that does not produce a hazard, for example, replacing lead-based paint with titanium white. To be an effective control, the new product must not produce another hazard. Because airborne dust can be hazardous, if a product can be purchased with a larger particle size, the smaller product may effectively be substituted with the larger product, according to Canadian Centre for Occupational Health and Safety (2006).

Engineering controls: The third most effective means of controlling hazards is engineered controls. These do not eliminate hazards, but rather isolate people from hazards, according to the New York Committee for Occupational Safety & Health (2012). Capital costs of engineered controls tend to be higher than less effective controls in the hierarchy, however they may reduce future costs (NIOSH, 2018) For example, a crew might build a work platform rather than purchase, replace, and maintain fall arrest equipment. "Enclosure and isolation" creates a physical barrier between personnel and hazards, such as using remotely controlled equipment. Fume hoods can remove airborne contaminants as a means of engineered control, according to the Canadian Centre for Occupational Health and Safety (2006.)

Administrative controls: Administrative controls are changes to the way people work. Examples of administrative controls include procedure changes, employee training, and installation of signs and warning labels as those in the Workplace Hazardous Materials Information System), according to New York Committee for Occupational Safety & Health (2012). Administrative controls do not remove hazards, but limit or prevent people's exposure to the hazards, such as completing road construction at night when fewer people are driving, according to Canadian Centre for Occupational Health and Safety (2006).

Personal Protective Equipment (PPE): Personal protective equipment (PPE) includes gloves, Nomex/Uniform, respirators, hard hats, safety glasses, high-visibility clothing, and safety footwear. PPE is the least effective means of controlling hazards because of the high potential for damage to render PPE ineffective according to the Canadian Centre for Occupational Health and Safety (2006).

3. THEORETICAL FRAMEWORK

Heinrich Domino Theory of Corrective Action Sequence (1932).

One of the earliest theorists that theorized about industrial accident was Herbert William Heinrich who first wrote about the contributions of human factor and environmental factors to industrial accidents in one of his papers titled "industrial accidents and prevention: the scientific approach" in 1931. In his proposition which later became a full theory in 1932, Heinrich argued that over 80% of industrial accidents are caused by human factor which is regarded as unsafe act.

However, advancing on the theory, Heinrich forwarded that in the sequence of industrial accident, five major factors which he called Dominoes form a chain of sequence. These dominoes include: social environment and ancestry, fault of person, unsafe act or mechanical or physical hazards (unsafe conditions), accident and injury. These dominoes were further explained as follows:

Social environment and Ancestry: this is the first domino in the accident sequence which deals with personality. According to Heinrich (1932), undesirable personality traits such as stubbornness, greed, recklessness, etc. can be inherited from parents or transmitted to individual through social interaction in the form of cultural practices, peer interaction, parental care often regarded as "Nature and Nurture". Such traits lead to personal fault.

Fault of Person: fault of person within the context of domino theory is used to express human flaws or the undesired characteristics of people such as bad temper, inconsideration, ignorance, recklessness, impatience, mood swing etc. These individual characteristics increase the propensity to engage in unsafe act such as not using PPE, not obeying safety rules, not following the work process among others. All these culminated to bring about unsafe act.

Unsafe Act and/or unsafe conditions: the third domino deals with the resultant effect of the first and second dominoes. As earlier noted, fault of person breeds unsafe act such as not warming the machine before use, not wearing the PPE, among others. Additional to unsafe act, certain work process or machinery are hazardous. These were regarded as hazards or unsafe conditions in the work place. Examples include; poor quality equipment, high temperature, poor work organization, poor general housekeeping etc. the interplay among the first three dominoes lead to accidents.

Accident: accident is the unforeseen events that lead to injury, sickness, damage of properties as well as death in fatal cases. To theory proponent, accident include such events as falls of person, striking of persons by flying objects, trips etc. the most common consequences of accident is injury

Injury: injury results from accidents. It is any form of ulceration or fracture on the body accompanied by bleeding or oedema (fluid accumulation in the body), pains and other forms of discomfort. For Heinrich, injury means cuts, broken bones or dislocation.

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Among the propositions of the theory was also the means of controlling accidents in the workplace. To Heinrich, there are three cardinal means of ensuring that accident in the workplace is mitigated. These means were conceptualized as the 3Es of accident prevention. It is the inclusion of the 3Es that brought about the name “Model of Accident Corrective Action Sequence”. The three Es are; engineering, education and enforcement.

Engineering: Control hazards through product design or process change, elimination and substitution.

Education: Train workers regarding all facets of safety, training of management on the benefits of healthy workers that result from safe work environment.

Enforcement: Ensure that internal and external rules, regulations, and standard operating procedures are followed by workers as well as management.

The 3Es of accident prevention advanced by Heinrich were based on his arguments as follows:

1. The potential injury only occurs as a result of an injury (Final Domino).
2. An accident only happens as result of personal or mechanical hazard.
3. Hazards only occur as a result of people’s faults.
4. Faults of people are inherited, born, bred and educated.

Thus, by removal of an optical domino, it will cause the effect not to happen. This is done by training the staff and to make them aware of the danger in the workplace.

Empirical Review

Agwu (2014) conducted a study on the challenges of SMEs in Port Harcourt in a paper titled ‘Issues, Challenges and Prospects of Small and Medium Scale Enterprises (SMEs) in Port-Harcourt City, Nigeria’. Results from the data analysis indicated that poor financing, inadequate social infrastructures, lack of managerial skills and multiple taxation were major challenges confronting SMEs in Port-Harcourt City, thus the researcher recommended: provision of soft loans to SMEs operators, government guaranteeing of long-term loans to SMEs operators, establishment of SMEs funding agency, public/private sector partnership in infrastructural provision, capacity building for SMEs operators and provision of tax incentives for SMEs operators.

In a related study, Onugu (2005), in a study titled; Small and Medium Scale Enterprises (SMEs) in Nigeria: Problems and Prospects, stated that the study was undertaken to find out if the SME sub-sector in Nigeria has performed its critical role of driving the country’s industrial transformation and development as it has done in other developed countries; and if not, why, and also to identify remedial measures. The major findings of this study include the following: SMEs have played and continue to play significant roles in the growth, development and industrialization of many economies the world over. In the case of Nigeria, SMEs have performed below expectation due to a combination of problems which ranges from attitude and habits of SMEs themselves through environmental related factors, instability of governments and frequent government policy changes and somersaults; The top ten problem areas of SMEs in Nigeria in decreasing order of intensity include: management, access to finance, infrastructure, government policy inconsistencies and bureaucracy, environmental factors, multiple taxes and levies, access to modern technology, unfair competition, marketing problems and non-availability of raw materials locally.

Bande and Lopez-Mourelo (2015) in their study titled ‘The Impact of Workers’ Age on the Consequences of Occupational Accidents. Empirical Evidence Using Spanish Data’ examined extensive impact of workers age on the various consequences of occupational injuries. The analysis shows that the probability of suffering a severe or fatal accident, as well as the duration of sick leave, increases with the workers’ age once personal, job and accident characteristics are controlled for. From a policy perspective, the result point out that decisions about delaying the retirement age require additional measures, such as the occupational reallocation of these older workers towards tasks with lower incidence rates, in order to minimize these effects

Amodu, Amodu, Bimba, and Bolori (2017) studied occupational hazard problems encountered by female farmers in Northeastern region of Nigeria. The results showed that 662 (82.8%) of the female farmers interviewed complained of back pains. Six hundred and twenty-four or (78.0%) of the respondents suffered lacerations from the usage of farm implements such as hoes, axes, sickles, cutlass, and also from grasses and thorns. Insect stings were the third most prevalent diseases

and constitute 59.5% of the respondents. Other diseases prevalence were; sunburns, snake bites, fractures, and injuries from falling trees and branches, which constitute 20.6% of the farmers. The respondents got treatments at homes, traditional healers, and hospitals. Farming activities among rural women farmers in Northeastern Nigeria was found to be their means of livelihood.

4. METHODOLOGY

This study was a descriptive, cross-sectional study of selected registered small and medium Enterprises (SMEs) in Port Harcourt metropolis, Rivers State and the study was carried out in Port Harcourt metropolis. The population for the study consisted a total of about four thousand two hundred and twenty two (4,222) SME Operators. The sample size for the study was six hundred and sixty (660), comprising four hundred and forty (440) conventional SME workers and two hundred and twenty (220) SME operators/Manager/HSE officer. This sample was determined using Taro Yamane formula. Non-proportionate stratified random sampling technique was used to draw the 660 participants from 220 SMEfirms. The 660 respondents were stratified into ten selected SME sub-sectors of interest to this study. The instruments for data collection was a set of researcher-structured questionnaires titled "Occupational Health Hazards Identification Questionnaire (OHHIQ). The design of the questionnaire was in two (2) sections. Section A gave bio data of the respondent. Section B was further divided into subsections, where multiple choice questions on likert scale was asked. The reliability of the instrument was determined using test-retest method and the result of the analysis yielded a Cronbach Alpha reliability coefficient of 0.86. The data gathered from the field survey were sorted, coded, inputted into IBM SPSS (Statistical Product and Service Solution) version 25 and analysed using appropriate statistical tools such as frequency, percentages, mean and standard deviation for research questions and Z-test, one-way analysis of variance (ANOVA), Multiple Regression analysis for test of hypotheses.

5. RESULTS AND DISCUSSION

Analysis of Demographic Characteristics of Respondents

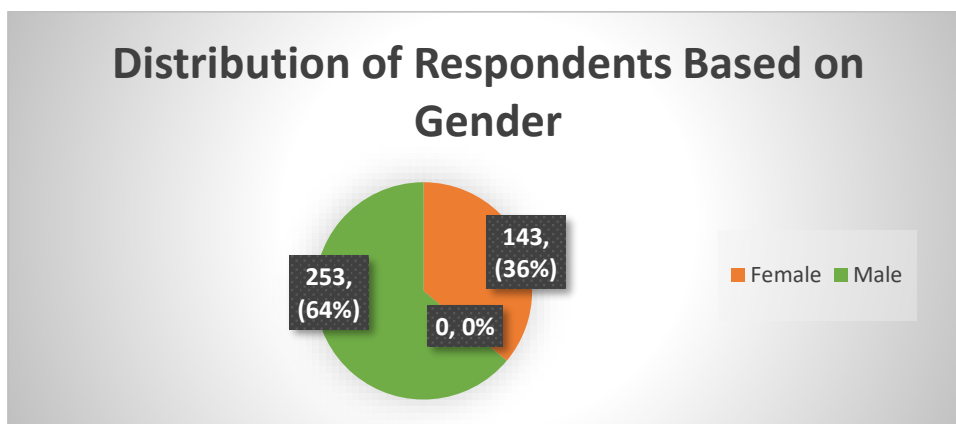


Figure 1: Gender Distribution of Respondents

Figure 1 reveals that majority of the respondents were male representing 64% while the remaining 36% were females.

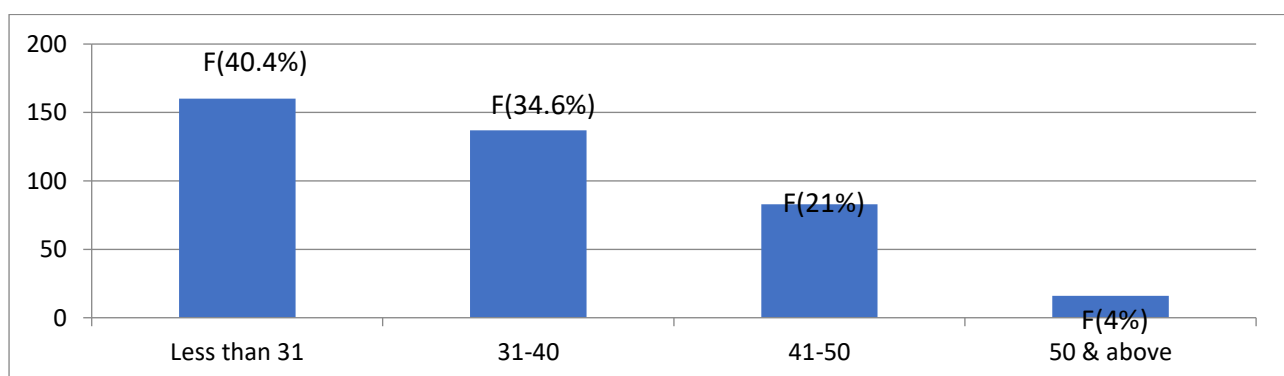


Figure 2 Age distribution of respondents

Figure 2 revealed that 40.4% of the respondents were less than 31 years, 34.6% were within 31-40 years old, 21% were within 41-50 years while only 4% were above the age of 50.

Analysis of Research Questions

Research Question 1: What are the occupational hazards among SME workers in Port Harcourt?

Table 1: Mean and Standard deviation Analysis of OHS Hazards among SME Workers.

S/No	OHS-Hazards	\bar{X}	SD	Rank	Remark
	Physical hazards				
1	Exposed to loud noise level in my workplace	2.45	1.08	4th	Disagree
2	Working with object, tools, equipment, machine, chemical etc. that has high temperature.	2.16	1.18	10 th	Disagree
3	Exposed to vibration from workplace machines and equipment	2.09	1.22	12 th	Disagree
4	My workplace is inadequately lighted, hence workers are exposed to inadequate illumination	1.16	0.54	30 th	Disagree
5	Exposed to Radiations like in welding, radioactive substances emitted as I perform my job function	1.28	0.72	28 th	Disagree
6	Exposed to unsafe conditions that can cause accidents at my workplace	2.13	1.01	11 th	Disagree
7	Exposed to health risks that can cause diseases at my workplace	1.65	0.84		Disagree
	Grand mean and SD	1.85	0.94	2nd	Disagree
	Chemical Hazards				
7	Exposed to chemical substances such as solvents, mist, fumes and gases	2.20	1.36	9 th	Disagree
8	Exposed to substances such as dust particles of metals and metalloid	2.08	1.16	13 th	Disagree
8	Exposed to chemical/gases which are flammable, poisonous and corrosive	1.63	1.01	18 th	Disagree
10	The hazardous chemicals are sometimes inhaled, ingested, injected and spill over my skin	1.50	0.74	20 th	Disagree
11	Exposure to chemical hazards that could cause reproductive disorder, cardiovascular disease, respiratory diseases, renal diseases etc.	1.25	0.46	29 th	Disagree
	Grand mean and SD	1.73	0.95	4th	Disagree
	Mechanical/ergonomic hazards				
13	I take awkward posture while working	2.00	1.05	14 th	Disagree
14	I work in height	1.41	0.84	24 th	Disagree
15	I stand for a long while at work	2.93	0.98	2 nd	Agree
16	The work equipment at my duty post is obsolete	1.47	0.83	23 rd	Disagree
17	I lift heavy objects manually and working tools and materials arrangements in my workplace are not comfortable and convenient with my job functions.	2.35	1.11	7 th	Disagree
18	I sit most time when I am on duty	2.94	0.78	1 st	Agree
19	My work is repetitive and monotonous	2.41	1.06	6 th	Disagree
20	Mechanical/Ergonomic hazards cause me back ache, neck and body pain	2.23	0.84	8 th	Disagree
	Grand mean and SD	2.22	0.94	1st	Disagree
	Biological Hazards				
21	Microbes could be found in some substances I work with in my work station	1.59	0.88	19 th	Disagree
22	Exposed to hazardous wastes while working which could impact on my health	1.64	0.89	17 th	Disagree
23	Workplace prone to rodent infestation	1.40	0.69	25 th	Disagree
24	Proper environmental hygiene is lacking in my place of work	1.41	0.79	24 th	Disagree
	Grand mean and SD	1.51	0.81	5th	Disagree
	Psychosocial Hazards				
25	My workload is excessive	2.72	0.86	3 rd	Agree
26	I would like to be transferred to another unit/department	1.39	0.78	26 th	Disagree

27	I work in isolation	1.96	0.98	15 th	Disagree
28	I am constantly talked down by my Superior	1.95	0.92	16 th	Disagree
29	I am faced with some kind of aggression and harassment in my place of work	1.48	0.72	22 nd	Disagree
30	I face bullying by my superior but I feel threatened to report or do anything about it	1.29	0.61	27 th	Disagree
31	Psychosocial hazard at work causes me hypertension, anxiety, boredom etc.	1.49	0.70	21 st	Disagree
	Grand mean and SD	1.76	0.80	3rd	Disagree
	Aggregate mean and SD	1.86	0.89		Disagree

Table 1 shows the mean and standard deviation analysis of the occupational hazards among SMEs workers in Port Harcourt metropolis. The Table shows that mechanical and ergonomic hazards were the most inherent occupational health hazards among SMEs workers in Port Harcourt with a mean score of 2.22 ± 0.94 . This was followed by physical hazards and psychosocial hazards with mean score of 1.85 ± 0.72 and 1.76 ± 0.89 respectively. On the lower ebb, biological hazards were less among SMEs in Port Harcourt with the mean score of 1.51 ± 0.81 . The mean rating of all the forms of hazards is less than the criterion mean of 2.5 ± 00 which is the cut off mark for unacceptable degree of hazards exposure.

Research Question 2: To what extent is the exposure to occupational hazards among SME workers in Port Harcourt metropolis based on age?

Table 2: Mean analysis of SME workers exposure to occupational Hazard based on Age

Hazard Exposure	<31		31-40		41-50		51 & above	
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
Physical hazards	2.51	0.011	2.45	0.632	2.03	0.832	2.23	0.666
Chemical hazards	2.48	0.712	2.39	0.311	2.24	1.111	1.99	0.711
Mechanical/ergonomic hazards	2.47	0.962	2.41	0.447	2.13	0.064	1.87	0.581
Biological hazards	1.31	0.781	1.04	0.931	1.09	0.742	0.99	0.784
Psychosocial hazards	2.14	1.041	1.57	0.832	1.45	0.612	1.98	0.883
Average mean	2.17	0.701	2.00	0.611	1.93	0.632	1.87	0.245

Table 2 shows the mean analysis of SMEs workers exposure to occupational Hazard based on Age. The result revealed that the respondents <31 years of age had the highest level of exposure to occupational health hazards (OH-H) with a mean score of 2.17 ± 0.701 while the least exposure to OH-H were experienced by those between 51 years and above with an average mean score of 1.87 ± 0.245 . This implies that the level of exposure of SME workers to occupational hazards differed based on age.

Research Question 3: To what extent is exposure to occupational hazards among SME workers in Port Harcourt metropolis based on gender?

Table 3: mean analysis of SMEs workers exposure to occupational Hazard based on Gender

Hazard Exposure	Female		Male	
	\bar{X}	SD	\bar{X}	SD
Physical hazards	2.08	1.211	2.09	0.942
Chemical hazards	1.16	0.499	1.85	0.906
Mechanical/ergonomic hazards	2.45	1.019	2.49	1.164
Biological hazards	1.28	1.011	2.20	1.356
Psychosocial hazards	1.92	0.884	2.02	1.012
Average mean	1.78	0.925	2.13	1.076

Table 3 showed that average mean exposure of female SME workers is 1.78 ± 0.925 while that of the male is 2.13 ± 1.076 . The mean difference in the level of exposure of female and male SME workers is -0.35 . This implies that there was a difference in the level of occupational health hazard exposure of SME workers based of gender. Meaning that male workers are more exposed to occupational hazards than their female counterpart.

Research Question 4: What are the most common types of occupational hazards found in each SME sub-sector?

Table 4: Analysis of the most common types of occupational hazards found in each SME Business types.

OH-Hazards Classification	Types of SME Businesses																					
	GBS		OGB		M		BC		H		CT		EDU		ICT		AB		S		TOTA	
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
1 Physical hazard	1.55	0.74	1.62	0.69	2.01	0.68	2.61	0.83	2.05	0.92	2.14	0.65	1.23	0.33	1.53	0.67	2.08	1.19	1.61	0.37	1.84	0.71
2 Chemical hazards	1.54	1.00	1.82	0.86	2.16	0.87	2.37	0.83	1.87	0.85	1.72	0.67	1.50	0.49	1.30	0.51	1.81	0.67	1.22	0.45	1.73	0.72
3 Mechanical/ergonomic hazards	2.00	0.91	1.93	0.70	2.07	0.65	2.73	0.80	2.14	0.88	2.48	0.77	2.07	0.62	2.09	0.66	2.57	0.93	2.14	0.79	2.22	0.77
4 Biological hazards	1.47	0.86	1.00	0.00	1.50	0.48	1.54	0.59	1.72	0.92	1.54	0.59	1.18	0.41	1.20	0.41	2.68	0.91	1.15	0.35	1.50	0.55
5 Psychosocial hazards	1.70	0.82	1.51	0.64	1.52	0.53	1.57	0.67	1.66	0.73	1.55	0.57	2.02	0.71	1.91	0.82	1.85	0.72	2.24	0.78	1.75	0.70
GRAND TOTAL	1.65	0.87	1.58	0.58	1.85	0.64	2.16	0.74	1.89	0.86	1.89	0.65	1.6	0.51	1.61	0.61	2.20	0.88	1.67	0.55	1.81	0.70

Table 4 illustrates the most common types of occupational hazards among each SME sub-sector in Port Harcourt metropolis. The result revealed that Agricultural workers were more prone to biological hazards, mechanical hazards, chemical hazards and physical hazards, while Building and construction workers were more prone to mechanical and physical hazards, and that manufacturing workers were more prone to chemical, ergonomic and physical hazards.

Test of Hypotheses

Hypothesis 1: There is no significant difference in exposure to occupational hazards among SME workers in Port Harcourt metropolis based on age.

Table 5: Summary of One-Way ANOVA in exposure to occupational health hazards among SME workers in Port Harcourt based on age

Level of exposure to OH-hazards	Sum of squares	Mean square	F.cal	Df	P.val	Decision
Between group	18.569	7.993	7.33	3	0.000	Significant
Within group	359.452	1.090		392		
Total	378.021			395		

P<0.05

The result in Table 5 shows the F.cal of 7.33 and the P.val of 0.000 (P<0.05). Hence the null hypothesis (H₀₁) was rejected. This means that there was a significant difference in exposure to occupational health hazards of SME workers in Port Harcourt based on age. Thus, the older the worker, the less exposed they are to some of the health and safety hazards in the workplace. And that the younger workers are more exposed to hazards.

Hypothesis 2: There is no significant difference in exposure to occupational hazards among SME workers in Port Harcourt metropolis based on gender.

Table 6: Summary of Z-Test Analysis of SMES Workers Hazard Exposure Based On Gender

SME size	N	\bar{X}	SD	DF	z-cal	P.val	Decision
Female	143	1.78	0.925	394	-4.348	0.007	Significant
Male	253	2.13	1.076				P<0.05

Table 6 illustrates the Z-test analysis of workers exposures to occupational hazards based on gender of SME workers in Port Harcourt metropolis, the result showed that the Z_{cal} was -4.348 and P<0.05. Since the P<0.05, the null hypothesis that there is no significant difference in the level of SME workers exposure to occupational health hazards based on gender was rejected. Thus, there is a significant difference in the level of SMEs workers exposure to occupational health hazards based on gender.

6. CONCLUSION

This study surveyed occupational health and safety hazards, hazard control and occupational health and safety management system among Small and Medium Enterprises in Port Harcourt metropolis. Mechanical/ergonomic hazards were the most prevalent hazards among SMEs, followed by physical hazards, psychological hazards. The least hazards prevalent among SMEs were biological hazards and chemical hazards. Majority of the SMEs has no occupational Health and Safety Management System (OHS-MS). Age and working experience were significantly associated with hazard exposure. Company size, and type of industries also influence the establishment of OHS-MS. The larger the size of the organization, the more likely OHS-MS is established. Type of industry was positively correlated with hazard control measures.

7. RECOMMENDATIONS

Reference to the findings of this study, the following recommendations were made:

1. Government should become more proactive in implementing OHS legislations on industries especially agricultural and ICT industries by designing enforcement programmes to help protect the lives of millions of Nigerians working in these sectors, as well as to improve the productivity of this set of workers.
2. Industry owners and managers should be sensitized through regular trainings, seminars, and workshops so that they can integrate OHS-MS and into their corporate management system.
3. Government should partner with health promotion organizations to intensify awareness campaign on the occupational hazards and its burden on individual lives and national economy so as to encourage self-driven actions towards the implementation of OHS rules and regulations across all the stakeholders

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