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OCCUPATIONAL HAZARDS ON ARTISANS PRODUCTIVITY IN EDO STATE, NIGERIA

DANIA, AFE VICTOR OD, MPH, FNCO
Department of Optometry, Faculty of Health Sciences,
Bayelsa Medical University,Bayelsa State

DANIA, EVELYN NDIDI, PhD.
Department of Economics, Faculty of Arts, Management and Social Sciences,
Admiralty University of Nigeria,
Delta State.

AND

DIBIE KASHIARI ESTHER, PhD.
Department of Economics,
Faculty of Management and Social Sciences,University of Delta, Agbor,
Delta State.

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Abstract

BACKGROUND: This study investigated the impact of occupational hazards on the productivity of artisans in Edo State. The study was guided by four dimensions of occupational risk which included physical, biological, chemical and psychological hazards. A cross-sectional survey project was conducted among artisans in Edo State. A questionnaire was developed to respond to the research hypotheses. A total of twelve hundred (1200) artisans were deliberately selected METHODS; Across the state. The questionnaire was based on the Likert scale. Content validity was used to determine the validity of the tool while Cronbach Apha was used to determine the reliability of the study which produced a coefficient of 0.88 (88%) for physical risk, 0, 82 (82%) for chemical hazard, 0.67 (67%) for biological hazard, 0.77 (77%) for psychological hazard and 0.78 (78%) for productivity. The frequency distribution and the percentage were used to analyze the demographic profile of the respondents. Correlation was used to verify the presence of multicollinearity and multiple

regression was used to analyze the study hypotheses. All dimensions of occupational risk have a negative impact on the productivity of artisans, but only RESULTS; physical risk is insignificant. This means that occupational risk has a negative impact on productivity. There should be occupational safety and health awareness among artisans with the aim of promoting the health and well-being of artisans and artisans should receive occupational safety and health training in order to minimize the number of causes of occupational risk, thereby increasing their productivity.

Introduction

The rate of occupational injuries and illnesses is increasing in most developing economies around the world, it has been estimated that over 120 million accidents occur in the workplace with over 200,000 deaths per year in developing countries (Lund and Marriott, in Sujan, Sanju, Grish & Uday, 2018). Occupational hazards can lead to serious lifelong health problems in workers due to poor sanitation and an inadequate or unsafe work environment, which can lead to low worker productivity and negatively affect 'economy. Academically, huge productivity, economic growth and development can be achieved by the encouragement, improvement or promotion of good health, safety and better quality of the working environment.

According to World Health Organization (WHO) in Sujan, Sanju, Grish , and Uday (2018), poor occupational health can reduce capacity of workers which accounts for a loss of upto10–20% of the gross national product (GNP) of a country worldwide. Occupational diseases, illnesses, and death accounts for an estimated loss of 4% of the country's gross domestic product (Amponash & Dartey, 2003).In 2016, International Labor Organization (ILO) estimated that 6300 people die every day due to occupational accidents and over 2.3 million deaths occur per year as a result of work related sicknesses.

Most of the work of artisans is in the informal sector which falls outside the scope of government, labour, occupational safety and health regulations. In general, it has been observed by researchers such as Rockefeller Foundation, (2013) and Ahmed, Usman, Nazir and Shaukat, (2018) that informal workers (artisans) are particularly vulnerable to occupational injuries and illnesses due to poverty illiteracy and precarious and dangerous working conditions. These injuries and illnesses have a negative impact on the productivity of artisans which directly affect the economy of the state. These artisans or workers in the informal sector are largely engaged in services or activities such as spraying, painting, vehicle engine repair, welding, cleaning, cutting, grinding, servicing, /styling, wood working, etc, where they are exposed to various hazards such as light/radiation, welding fumes, sharp metals, electric current, heat noise, sparks, vibrations, chemicals, etc. in their working environment. It is easy to see some artisans lift or carry heavy loads manually, work without protective/safety equipment, litter the street with lethal oil, eat without washing their hands, play in stores, glean, use sensitive equipment without asking permission, and test cables under tension with bare hands, including others without taking into account the danger nature of their action for their productivity.

One wonders if these artisans know the health and productivity implications of these negligent actions or behaviors. These

careless actions have led to the untimely death of some, blindness, amputation and other injuries or health challenges of the artisans. The magnitude of effect on these issues on the productivity and economy growth of Edo state is the challenge of this study.

Objectives of the study

Occupational hazards are related exposures to; physical, chemical, biological and psychological hazards to the artisan, thus, the objectives of this research are to;

- To determine the impact of physical hazard on the productivity of an artisan in Edo state.
- To examine the impact of chemical hazard on the productivity of an artisan in Edo state.
- To ascertain the impact of biological hazards on the productivity of an artisan in Edo state.
- To evaluate the impact of psychological hazards on the productivity of an artisan in Edo state.

Hypotheses

The research work is guided by the following hypotheses

a) Physical hazard does not have significant impact on the productivity of an artisan in Edo state.

b) Chemical hazard does not have significant impact on the productivity of an artisan in Edo state.

c) Biological hazard does not have significant impact on the productivity of an artisan in Edo state.

d) Psychological hazard does not have significant impact on the productivity of an artisan in Edo state.

Conceptual Definitions

An artisan is an unskilled or under-skilled trade who works with his own hands to create unique, functional and/or decorative objects according to the traditional methodology. Artisans are masters of their craft and create products such as clothing, toys, tools, furniture, etc. This artisanal methodology is learned through decades of tribal knowledge and passed down within families and communities. Many artisans depend on the resources of their environment to create these items. In economic terms, an artisan is a small producer of goods who owns his production and lives from his trade, while productivity is the ratio of the volume of production to the volume of inputs.

In other words, it measures how efficiently production inputs such as labour, land, and capital are used in an economy to produce a given level of output. Productivity is considered a key source of economic growth and competitiveness, and as such, is fundamental statistical information for many international comparisons and assessments and comparisons of country performance.

Hazard refers to anything that has the potential to cause harm to people, the environment and/or property. A hazard is an unpleasant or undesirable event, situation or condition that occurs and has negative effects on people and productivity. According to the Canadian Center for Occupational Health and Safety (2020), an occupational hazard is generally defined as any potential source that can cause injury or damage the health of a worker.

Gambhir, Singh, Sharma, Brar and Kakar (2011) defined it as a material, substance, process or work situation that predisposes to illness or injury, or can directly cause illness or injury to workers in the workplace, even years after workers have left the occupation or work. Some hazards can have immediate harmful effects when they occur, such as injuries from accidents (eg broken bones from falling from heights), the danger and the occurrence of harmful consequences (for example, low back pain due to repeated bending) (ILO, 2000; ILO, 2015).

A specific group of informal workers subject to occupational hazards are artisans. Previous research has reported numerous OSH problems among artisans, including hand, finger or eye injuries, burns, bruises, fractures, hand dermatitis, headaches, dizziness, fatigue, back, waist and joint pain and hearing problems (Elenwo, 2018; Ojo, Onayade, Akinyemi and Adsanmi, 2017; Adejumo, Olaiya and Sridhar, 2017 etc.). Hazards are categorized into physical, chemical, biological, psychological etc.

Physical hazards are materials, substances or activities that threaten the physical safety of a worker. According to Harwood (2015), physical hazards involve environmental hazards that can cause harm with or without contact. These are injuries that occur on parts of the body such as hands, eyes, legs, etc. They are often the most common in any workplace. They include noise, heat and cold stress, bruising from falls, lighting, vibration and electromagnetic radiation.

Chemical hazards are subtypes of occupational hazards resulting from exposure to harmful and hazardous chemical compounds. Chemicals in the form of solids, liquids, gases, fumes, dusts, mists and vapours can have toxic effects on workers if inhaled through breathing, direct skin contact (absorption) or ingested by eating or drinking (World Health Organization, 2001). Hazardous chemicals include neurotoxins, immune agents, skin toxins, systemic toxins, pneumoconiotic agents and sensitizers.

Biological hazards are risks in the workplace caused by biological agents such as microorganisms and toxins produced by living organisms (Olaoye, Odebiyi & Abimbola ,2015). They exist due to exposure to bacteria, viruses, fungi, and other living organisms, animals or their products that are subject to biohazards. Examples of biohazards include bites and stings from snakes, insects, scorpions, and spiders. Consistent with the above, Dania (2019) noted that, increased susceptibility to trachoma is also associated with biological agents, generally associated with poverty; poor water supply, sanitation, hygiene, living conditions, housing and therefore, these diseases are indicators of poverty and underdevelopment.

Psychological/behavioral hazards are a subtype of occupational hazards that affect the social life or psychological health of workers. These include burnout and job stress. They can manifest as boredom, production pressure, repetitive tasks and low wages.

Cost of Occupational Hazard

The cost of occupational risk is high and can be categorized into direct and indirect costs (Mendeloff & Staetsky, 2014). Leigh, Markowitz, Fahs and Landrigan (2000) described direct costs as insured and easily quantifiable costs, Safe Work

Australia (2012) categorized direct costs to include workers' compensation premiums paid by employers or payments to injured or disabled workers by workers' compensation groups.

Indirect costs, on the other hand, are seen as the lost opportunities for the injured employee, their family, their employer, their colleagues, the community and the government as a whole (Leigh et al., 2000). According to Safe Work Australia (2012), indirect costs are lost productivity, loss of current and future earnings, potential loss of production, and the cost of providing social protection programs to injured or disabled workers directly related to treatment and repair of the injury. In Contrast to direct costs, indirect costs are generally intangible in nature.

This means that they are much more difficult to calculate. One of the main indirect costs of accidents at work and occupational diseases is the loss of working hours. However, the indirect costs of accidents and illnesses at work are estimated at 2.7 times the direct cost (Health and Safety Executive, 2018).

Empirical Literature

The following extant literature were reviewed for the study.

Olalekan and Wahab (2020) studied the occupational health risks associated with Nigerian fishing. The purpose of the study was to review the literature on occupational health risks associated with Nigerian fisheries. This was done by specifically reviewing the literature on the links between occupational health and sustainable development.

An overview of occupational hazards, fishing in Nigeria and occupational hazards in fishing with empirical evidence from Nigeria. The study indicated that occupational hazards had adverse effects on the level of fish production, fishing income and the loss of man hours.

Addae (2019) studied occupational health and safety among auto artisans in Suame Kumasi Magazine, Ghana. The study aimed to assess occupational health and safety (OSH) among auto artisans practicing all existing craft trades in the enclave with the aim of contributing to a broader understanding of occupational safety among auto artisans in Suame Magazine. The study was guided by positivist philosophy. Protective motivation theory and the conceptual framework of the DEFENS study were used for the study.

The survey (N=957) and 58 observations were used to generate data for the study. Data were analyzed using descriptive and inferential statistics. Twenty-nine self-crafting trades have been identified in the enclave. It has been found that the Occupational Safety Guide is organized for new car craftsmen. OSH guidelines have been found to influence risk awareness in the workplace, but not occupational risk perception. While organizational factors were associated with safety practices among automotive artisans, they were not associated with willingness to pay for occupational health and safety services.

Tunji-Olayeni, Afolabi, Olowookere, Okpalamoka and Oluwatobi (2019) assessed the implications of occupational hazards on the achievement of Sustainable Development Goals in the Nigerian construction sector. The study reported the results of a survey of 100 artisans in Lagos, Nigeria. The data obtained through the survey were analysed by means of frequencies and graphs. The study showed

that most artisans surveyed suffered from some form of health problem. Occupational hazards deprive workers of resources. They also lead to absenteeism, low productivity and poor project performance. Nationally, occupational hazards increase the burden of disease, which represents an additional cost for public health expenditure.

Oyediran, Sodiya, Omoare and Ogbonna (2017) assessed the effects of occupational health hazards on artisanal fish production in Ogun State, Nigeria. For this study, a simple random sampling technique was used to select 240 fishermen as the sample size. Descriptive statistics were used for objectives, while Pearson Product Moment Correlation was used to test hypotheses. The results of the study revealed that the average age of the respondents was 41.58 years old. The majority (71.67%) of respondents were male, had a secondary education (68.33%) and had spent 610 years in artisanal fishing. The result also indicated that the estimated income loss was ₦23,705.40 per month. The results of the correlation showed that there was a positive and significant relationship between occupational health risks and loss of income ($p<0.05$). It was concluded that artisanal fishers are affected by occupational health risks. Consequently, considerable incomes and man-day were loss on daily basis by the victims in the study area.

Akangbe, Komolafe and Oduwaiye (2015) studied the perceived effects of occupational hazards on farmer productivity in Kwara State, Nigeria. A total of 160 respondents were selected using a multistage random sampling technique. Descriptive statistical techniques such as frequency, percentages as well as Pearson's product momentum correlation analysis were used for the empirical analysis. The results showed that common agricultural production included maize, yams and cassava. The results also revealed the predominant occupational hazards, included cuts/injuries from agricultural tools, malaria from mosquito bites, and body pain.

The results also revealed that injuries from agricultural tools and general body pain had significant effects on agricultural productivity. The study concluded that occupational (Agriculture) hazards, particularly general body pain, have negative effects on agricultural productivity.

Methodology

The study used a cross-sectional survey design conducted among Artisans in Edo State. For data collection, a questionnaire was developed to answer the research hypotheses. The questionnaire had six sections. The first section contained demographic details of Artisans while sections two to six covered the research hypotheses. A total of one thousand two hundred (1200) Artisans were purposively selected across the three senatorial district in the state (four hundred from each district – the area surveyed were Auchi and Agenebode in Edo North, Uromi and Ekpoma in Edo Central and Benin City comprising of Oredo, Ego and Ikpoba –Okha LGAs in Edo South) The questionnaire was based on Likert scaling as this proved to be most appropriate for the study because it is one of the most frequently used numerical scales to measure attributes and behaviours in an organizational research (Sekaran & Bougie, 2010).

The content validity was used to determine validity of the instrument while Cronbach apha was used to determine the reliability of the study which yielded a coefficients of 0.88(88%) for; physical hazard, 0.82(82%), chemical hazard, 0.67 (67%), Biological hazard, 0.77(77%), psychological hazard, and 0.78 (78%) productivity. All these meant that the overall instrument was reliable.

The researcher employed the descriptive statistics such as frequency distribution and percentage in order to assess the demographic profile of the respondents. While the correlation was used to check for the presence of multicollinearity among variables, and the multiple regressions was used to analyse the hypotheses of the study by determining the magnitude and direction of the independent variables (occupational hazards) on the dependent variable (productivity).

Model Specification

The human capital theory places emphasis on investment in humans than in physical capital because the human capital works on the physical capital through adequate skill being acquired to operate the physical capital in place. This prepares the country for a better future since the productive capacity of individuals is improved, thus economic growth will be enhanced. The productivity in an economy depends on the level of efficiency of labour and capital inputs. Increase in investment in human capital brings about the efficient use of labour and capital resources.

The framework adopted in this study is similar to that of Osoba & Tella (2017). Hence, this study adapts the model equation

$lnrGDP=\alpha_0 + \alpha_1 lnPH + \alpha_2 lnED + \alpha_3 lnHE + \alpha_4 ln(ED*HE) + \varepsilon$ ……..(1)

Where *PH* is physical capital, *ED* is education, *HE* is health and *rGDP* is real gross domestic product

From equation (1), this study retained *HE* (health) because this study is mainly on human health. From the equ (1), the model was re-modified, incorporating occupational hazard (OH) which is an aspect of health, thus

Pdty = f(OH)

Where

OH =f(Physical hazard, Biological hazard, Chemical hazard, Psychological hazard)

$Pdty = \beta_0 + \beta_1 PhyH + \beta_2 BioH + + \beta_3 CheH + \beta_4 PsyH + U_t$……(2)

where : *Pdty = Productivity*

PhyH = Physical hazard

BioH = Biological hazard

CheH = Chemical hazard

PsyH = Psychological hazard

Result presentation, Analysis and Discussion of Findings

One thousand and two hundred (1200) questionnaires were distributed and one thousand one hundred and sixty one (1161) was duly completed and retrieved back after careful monitoring and supervision. This represented 97% response rate.

Table 1: bio-data result

s/n	Variable		Frequency	Percentage (%)
1	Marital status:	Married	501	43.2
		Single	660	56.8
2	Sex:	Female	35	3.0
		Male	1126	97.0
3	Age:	16-25	591	50.9
		26-35	302	26.0
		36-45	174	15
		46-55	94	8.1

	Above 55	0	0
4	Education: None	31	2.7
	Primary	141	12.1
	Secondary	660	56.8
	Tertiary	329	28.3
5	Occupation: Woodwork	239	20.6
	Mechanic	261	22.5
	Vulcanizing	181	15.6
	Welding	196	16.9
	Bricklaying	153	13.2
	Other	131	11.3
6	Class of Artisan: Apprentice	578	49.8
	Worker	319	27.5
	Supervisor	73	6.3
	Master	191	16.5

Source: *Researchers' Computation 2022*

The result in table 1 revealed that out of one thousand, one hundred and sixty-one (1161) respondents who filled and returned the questionnaires, five hundred and one (501) representing 43.2% were married and six hundred and sixty (660) representing 56.8% were single. This indicated that there were more single respondents in the survey than married respondents.

Sex; the result revealed that thirty (35) representing 3.0% were females while one thousand, one hundred and twenty six (1126) representing 97% were males. This revealed that there were more males in the survey than female.

Age; the result revealed 16-25 years had five hundred and ninety (590) representing 50.9%, 26-35 years had three hundred and two (302) representing 26.0%, 36-45 years had one hundred and seventy four (174) representing 15%, 46-55 years had ninety four(94) representing 8.1% and above 55years had no representation.

Education; the result revealed that thirty one (31) representing 2.7% had no formal education, one hundred and fourty one (141) representing 12.1% had primary education, six hundred and sixty (660) representing 56.8% had secondary education and three hundred and twenty nine (329) representing 28.3% had tertiary education .This revealed that most of the respondents had secondary education.

Occupation, the result revealed that Woodwork had two hundred and thirty nine (239) representing 20.6%, Mechanic had two hundred and sixty one (261) representing 22.5%, Vulcanizing had one hundred and eighty one (181) representing 15.6%, Welding had one hundred and ninety six (196) representing 16.9%, Bricklaying had one hundred and fifty three (153) representing 13.2% and others had one hundred and thirty one (13) representing 11.3%. The result indicated that there were more Mechanic in the survey.

Class of Artisa; the result reveled that five hundred and seventy eight (578) representing 49.8% were apprentices, three hundred and nineteen (319) representing 27.5% were workers, seventy three (73) representing 6.3% were supervisors and one hundred and ninety one (191) representing 16.5% were masters of their

own. This result indicated that there were more apprentices in the survey.

Table 2 : Correlation Matrix Result

	Phyh	Cheh	Bioh	Psyh	Pdty
Phyh	1				
Cheh	.251**	1			
Bioh	.104**	-.297**	1		
Psyh	-.005	.079**	.366**	1	
Pdty	-.055	-.101**	-.060*	-.355**	1

Source: *Researchers' Computation 2022*

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

*. Correlation is significant at the 0.05 level (2-tailed).

The result of table 2 (correlation matrix result) revealed that there is absence of multicollinearity which denied the presence spuriousity of the model which would have made the output of the model not good for policy and decision making. This is because all the results in the table were less than 0.75.

Table 3; Regression Result

Var	Co-eff	Std Er	t-stat	p-value
Const	1.039	0.087	11.961	0.000
Phyh	-0.048	0.032	-1.469	0.142
Bioh	-0.121	0.032	-3.742	0.000
Cheh	-0.096	0.030	-3.190	0.001
Psyh	-0.382	0.029	-13.283	0.000
R-square	0.843	Mean of dep var	1.794	
Adjusted R square	0.810	S.D of dep var	0.633	
F-stat	48.148	Akaike info cri	1.776	
F (Prob)	0.000	Schwarz cri	1.798	
DW-stat	1.889	H-Q cri	1.784	

Researchers' Calculation 2022

$Pdty = 1.039 - 0.048PhyH - 0.121BioH - 0.96CheH - 0.382PsyH + U_t$

(0.000) (0.142) (0.000) (0.001) (0.000)

R-square 0.843 (84.3%), R-bar square 0.810 (81%)

F-stat= 48.148, F (Prob) = 0.000

DW stat= 1.889

The results in table 3 revealed that nearly 84% of the systematic variations in artisan productivity is explained or accounted for by physical, biological, chemical and psychological hazards .This is endorsed by the R-bar square which is nearly 81%. The result also revealed that at least or all the independent variables are significant with the probability of the f-stat (0.000) less than 0.05. The DW stat of (1.88) nearly "2" indicated the absence of serial auto correlation in the model.

The results of the Phyh (*Physical hazard*) showed that physical hazard as a measurement of occupational hazard has a negative responsiveness to productivity. A unit increase in the physical hazard will reduce artisan productivity by 0.048 units and has an in-significant (0.142) impact on artisan productivity in Edo state, Nigeria.

The results of the Bioh (*Biological haszard*) showed that Biological hazard as a measurement of occupational hazard has a negative responsiveness to productivity. A unit increase on the biological hazard will reduce artisan productivity by 0.121 units and has a significant (0.000) impact on artisan productivity in Edo state, Nigeria.

The result of the Cheh (*Chemical hazard*) showed that Chemical hazard as a measurement of occupational hazard has a negative responsiveness to productivity. A unit increase in the biological hazard will reduce artisan productivity by 0.096 units and has a significant (0.001) impact on artisan productivity in Edo state, Nigeria.

The results of the Psyh (*Psychological hazard*) showed that Psychological hazard as a measurement of occupational hazard has a negative responsiveness to productivity. A unit increase in the Psychological hazard will reduce artisan productivity by 0.382 units and has a significant (0.000) impact on artisan productivity in Edo state, Nigeria.

Discussion of Findings

This study has been able to empirically investigate impact of occupational hazards on artisans' productivity in Edo state, Nigeria. From the study, it was clear that occupational hazards have a negative impact on artisans' productivity in Edo state. From the dimensions of occupational hazards (Physical, Chemical, Biological and psychological) reviewed, all had negative impact on artisan productivity, however, only physical hazard was in-significant.

This is consistent with study of Olalekan and Wahab (2020) who studied occupational health hazards associated with Nigerian fisheries and concluded that occupational hazards have negative effects on the level of production of fish, revenue from fisheries, and loss of man-days. Also, this study result is consistent with Tunji-Olayeni, Afolabi, Olowookere, Okpalamoka and Oluwatobi (2019) who assessed the implications of occupational hazards on attainment of the Sustainable Development Goals in the Nigerian construction industry and found that ooccupational hazards drain the resources of workers.

It also leads to absenteeism, low productivity and poor project performance. On a national scale, occupational hazards increase disease burden which is an additional cost to government spending on health care. In same vein, this study is consistent with Oyediran , Sodiya, Omoare and Ogbonna (2017) study who assessed the effects of occupational health hazards on artisanal fish production in Ogun State, Nigeria and concluded that the artisanal fisher-folks are affected by occupational health hazards. Consequently, considerable incomes and man-day are loss on daily basis by the victims in the study area.

Finally, This study is consistent with the study of Akangbe, Komolafe and Oduwaiye (2015) who investigated the perceived effects of occupational hazards on farmers' productivity in Kwara State, Nigeria and revealed that injury from farm tools and general body pain had high effects on agricultural productivity. The study concluded that occupational (farming) hazards, most especially general body pain, had negative effects on agricultural productivity.

Conclusion and Recommendations

This study investigated the impact of occupational hazards on artisans' productivity in Edo state, Nigeria. Demographically, the study showed that much of the respondents were single, male,

between the ages of 16-26 years, educated up to secondary level, mechanic and are apprentices. It was clear that all the dimensions of occupational hazard had negative impact on the productivity of the artisans but only physical hazard was in-significant. The means that occupational hazard has negative impact on productivity which invariably affects growth and development of Edo state, Nigeria.

It is therefore recommended that there should be awareness on occupational safety and health among the artisans with the aim of promoting health and well-being of the artisans. Also artisans should be given training on work safety and health in-order to minimize the numbers of causality of occupational hazard, hence, increasing productivity of the artisans and lastly, Occupational Safety and Health needs to be integrated into the informal training of apprentices by their masters to reduce the incidents of occupational hazard and boost productivity among the artisans in Edo state.

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