Determinants of Occupational Hazards among Workers of Food Processing Industries in Rivers State

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ABSTRACT

This study investigated the determinants of occupational hazards among workers of food processing industries in Rivers State. The research design adopted for this study was a descriptive survey research design with a population consisting of 15,500 workers in food processing industries in Rivers State. A multi-stage sampling procedure was used to select a sample size of 950. The instrument for data collection in this study was a structured questionnaire titled, 'Questionnaire on determinants of occupational hazards and safety practices (QDOH)' with a reliability coefficient of 0.903. Data analysis was done with the aid of the statistical product for service solution (SPSS) version 23.0 using simple regression at 0.05 level of significance. The finding of this study showed that there was a very high relationship between occupational hazards exposure and other factors such as knowledge ($r = -0.97$, $R^2 = 0.94$, $p<0.05$), years of work experience ($r = 0.92$, $R^2 = 0.85$, $p<0.05$), training ($r = -0.93$, $R^2 = 0.87$, $p<0.05$), and job specification ($r = 0.87$, $R^2 = 0.76$, $p<0.05$). It was concluded that the determinants of occupational hazards exposure among workers in food processing industries in Rivers State were knowledge of hazards, years of work experience, training and job specification. It was recommended among others that, professional organizations such as the National Industrial Safety Council of Nigeria (NISCN), the Institute of Safety Professionals of Nigeria (ISPON) and trade unions should organize periodic workshops and training programmes on occupational hazards and safety for the workers.

KEYWORDS: *Determinants, Food, Hazard, Occupation, Workers*

Introduction

Food processing industries are therefore the industries responsible for carrying out the process of food processing. The food processing industries manufacture food products – transforming raw material by physical or chemical means into food, or of food into other forms (Linday, 2019). Just like in every activity by humans, hazards are found to lurk around and may occur frequently, occasionally, or rarely depending on certain factors such as ability to identify the hazard(s), the level of adherence to the control or safety measure put in place to mitigate the identified hazard as well as the effectiveness of the control measure itself. Workers of food processing industries encounter hazards in the course of their activities of food processing (Taiwo, 2018). These hazards

commonly referred to as occupational hazards are the hazards encountered by workers or employees in course of practicing in their various areas of occupation though, the magnitude of such hazards could be mitigated by appropriate safety practice.

Food processing may also include the addition of ingredients to food (edibles) to extend shelf life (Monteiro et al., 2010, Floros et al, 2010, Dwyer et al, 2012); but, the activities entrenched in food processing are not without hazards, leading to injury among personnel. A report given by Graphicproduct (2021) showed that, more than 19,000 food manufacturing employees were injured on the job in 2015, and nearly 50 industry workers were killed each year between 2011 and 2015. Recent report also showed the risk of Salmonella Typhimurium which can be transferred to humans through raw or undercooked infected food including meat and eggs (Yourgenome, 2021). According to the Centers for Disease Control and Prevention (CDC) (2017), each year about 50 million people yield to food-based ailments, leading to the death of an estimated 3,000 people.

The foregoing revealed the hazardous nature of the food processing industries for which safety measures must be put in place to protect the health and well-being of the workers. The International Labour Organization (ILO, 2016), estimated that 2.02 million people die each year from work related diseases while estimated 337 million fetal and non-fetal work related accident per year are all associated to occupational hazards in response to this the International Labour Organization (ILO) constitution sets forth the principle that workers should be protected from sickness, diseases and injury arising from their occupation.

In Nigeria, the situation is not exception, for hazardous substances like every other developing nation. According to Oluwagbemi (2011), Nigeria have increased in magnitude sophistication and diversity over thirty years with challenges of ensuring and sustaining best practices and equipment required to perform high risk procedures. However, protecting the health and wellbeing of the worker is difficult. Workers in the food processing industries are exposed to hazards which significantly impair their health and quality of life, with multiplier effect on their immediate and extended family members that are poorly prepared to handle environmental hazard. Food processing industries are tasked with the production of marketable food product that can be easily prepared and served by the consumer.

A hazard is a threat, a future source of danger and has the potential to cause harm to people. It is any source of potential damage, harm or adverse health effect on something or someone. They are those elements of the physical environment, harmful to man and caused by forces extraneous to him (Capacity Building in Asia using Information Technology Applications CASITA, 2015). The occurrence or recognition of potential hazard brings to fore the concept of safety. Generally, safety constitutes one of the basic or fundamental human needs. determined by certain factors such as the time of exposure, the job specification and the knowledge one has concerning the occupational hazards.

Knowledge is a prerequisite to any health practice including safety and one's exposure to occupational hazards. Knowledge is a person's awareness or familiarity with a concept. With increased awareness about the need for safety practices to guide against occupational hazards

exposure, positive attitude would be influence with subsequent increase in safety practice. The relationship between knowledge and safety practices in the food industry have been confirmed in the study of Martins, Hogg and Otero (2012). This is because the knowledge factor plays a dominant role in safety practice workers exposure to hazards. In Sub-Saharan Africa especially Nigeria, despite the efforts of Government through its National Agency for Food and Drug Administration and Control (NAFDAC), to improve the safety of food supply, safety practices in the food processing industry still remains a major issue that has been exacerbated by the workers' ignorance about occupational hazards and safety practices (Omojokun, 2013).

On the other hand, workers' years of work experience could determine their occupational hazards exposure as it could make them have either a long term or short term exposure. According to Sumarjan et al. (2013), the years of work experience has an important input towards hazards exposure and ensuring the health of the worker. Those having longer years of work experience may have longer time of exposure to occupational hazards thereby increasing the effects of such hazards on the health of the workers. Also, the aspect of the job one is engaged in could also determine the extent of exposure to occupational hazards as some could be more exposed due to the type of equipment and activities entrenched in that aspect of the job. It is noteworthy that the job specification of the worker notwithstanding, occupational hazards exposure could be curtailed if positive attitude towards safety practices are imbibed.

Hazard in the food processing industries as a form of occupational hazard relates to any condition produced by the food industry that may cause injury or death to personnel or loss of product or property. Workers in the food processing industry like those in other occupations could be in contact with equipment and working conditions which exposed them to hazards in the food processing industry. Occupational hazards have been found to characterize virtually all industrial processes. Such hazards have the possibility of affecting external bodies especially of those in proximity to such industries may arise mainly due to certain factors. These factors usually revolve around taking of shortcuts; usually due to the need to work faster, poor housekeeping, neglect of safety procedure, lack of training which is linked to lack of knowledge on safety in the workplace and so on. Such factors collectively may be regarded to as determinants to occupational hazards and safety, which needs to be highlighted further for a concrete information to help tackle the risk arising from occupational hazards exposure in the food processing industry. Hence, the researcher was motivated to examine the determinants of occupational hazards among workers of food processing industries in Rivers State. The following research questions were asked to guide this study:

1. What is the relationship between knowledge and exposure to occupational hazards among workers in food processing industries in Rivers State?
2. What is the relationship between years of work experience and exposure to occupational hazards among workers in food processing industries in Rivers State?
3. What is the relationship between training and exposure to occupational hazards among workers in food processing industries in Rivers State?
4. What is the relationship between job specification and exposure to occupational hazards among workers in food processing industries in Rivers State?

Hypotheses

The following hypotheses were tested at 0.05 level of significance:

H_{01}: There is no significant relationship between knowledge of occupational hazards and exposure to occupational hazards among workers in food processing industries in Rivers State.

H_{02}: There is no significant relationship between years of work experience and exposure to occupational hazards among workers in food processing industries in Rivers State.

H_{03}: There is no significant relationship between training and exposure to occupational hazards among workers in food processing industries in Rivers State.

H_{04}: There is no significant relationship between job specification and exposure to occupational hazards among workers in food processing industries in Rivers State.

Methodology

The research design adopted for this study was a descriptive survey research design with a population consisting of 15,500 workers in food processing industries in Rivers State. A multi-stage sampling procedure was used to select a sample size of 950. The first stage was stratification of the State based on the senatorial districts which are: Rivers East, Rivers West, Rivers South-East senatorial districts. At the second stage, the simple random sampling technique was used to select two Local Government Areas (LGAs) from each of the stratum. At the third stage, a simple random sampling was used to select ten food processing industries from the selected areas. At the final stage, a simple random sampling was used to select the determined number of respondents from the food processing industries The instrument for data collection in this study was a structured questionnaire titled, 'Questionnaire on determinants of occupational hazards (QDOH)' with a reliability coefficient of 0.903. Data analysis was done with the aid of the statistical product for service solution (SPSS) version 23.0 using simple regression at 0.05 level of significance.

Table 1: Regression analysis on relationship between knowledge and occupational hazards constitute a determinant of occupational hazards exposure

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	Decision
1	-0.97	.94	.94	.72	2.66	Very High relationship

Table 1 showed the relationship between knowledge and occupational hazards exposure among workers in food processing industries. The result of the study showed that there was a very high negative relationship between knowledge and occupational hazards exposure (r = -0.97). The result further showed that knowledge contributed 94.1% of the variance in occupational hazards exposure (R^2 = 0.94). Therefore, the extent to which knowledge constitute a determinant to

occupational hazards exposure among workers in food processing industries in Rivers State was very high.

Table 2: Regression analysis on relationship between years of work experience and occupational hazards constitute a determinant of occupational hazards exposure

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	Decision
1	0.92	.85	.85	1.13	1.57	Very High relationship

Table 2 showed the relationship between years of work experience and occupational hazards exposure among workers in food processing industries. The result of the study showed that there was a very high positive relationship between years of work experience and occupational hazards exposure (r = 0.92). The result further showed that years of work experience contributed 85.0% of the variance in occupational hazards exposure ($R^2 = 0.85$). Therefore, the extent to which years of work experience determine occupational hazards exposure among workers in food processing industries in Rivers State was very high.

Table 3: Regression analysis on relationship between training and occupational hazards constitute a determinant of occupational hazards exposure

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	Decision
1	-0.93	.87	.87	1.07	1.75	Very High relationship

Table 3 showed the relationship between training and occupational hazards exposure among workers in food processing industries. The result of the study showed that there was a very high negative relationship between training and occupational hazards exposure (r = -0.93). The result further showed that training contributed 87% of the variance in occupational hazards exposure ($R^2 = 0.87$). Therefore, the extent to which training determine occupational hazards exposure among workers in food processing industries in Rivers State was very high.

Table 4: Regression analysis on relationship between job specification and occupational hazards constitute a determinant of occupational hazards exposure

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	Decision
1	0.87	.76	.76	1.45	1.49	Very High relationship

Table 4 showed the relationship between job specification and occupational hazards exposure among workers in food processing industries. The result of the study showed that there was a very high positive relationship between job specification and occupational hazards exposure (r = 0.87). The result further showed that job specification contributed 76% of the variance in occupational hazards exposure (R^2 = 0.76). Therefore, the extent to which job specification determine occupational hazards exposure among workers in food processing industries in Rivers State was very high.

Table 5: Regression analysis on significant relationship between knowledge of occupational hazards and occupational hazards exposure

Model		Sum of Squares	df	Mean Square	F	Sig.	Decision
1	Regression	7675.546	1	7675.546	14785.70	.00*	**Rejected**
	Residual	465.650	897	.519			
	Total	8141.196	898				

*Significant, p<0.05

Table 5 revealed the regression analysis on relationship between knowledge of occupational hazards and occupational hazards exposure among workers in food processing industries. The findings of the study revealed that there was a significant relationship between knowledge of occupational hazards and occupational hazards exposure [f(1,897) = 14785.70, p<0.05]. Therefore, the null hypothesis which stated that there is no significant relationship knowledge of occupational hazards and occupational hazards exposure among workers in food processing industries in Rivers State was rejected.

Table 6: Regression analysis on significant relationship between years of work experience and occupational hazards exposure

Model		Sum of Squares	df	Mean Square	F	Sig.	Decision
1	Regression	6986.857	1	6986.85	5462.32	.00*	Rejected
	Residual	1146.073	897	1.27			
	Total	8132.931^d	898				

*Significant, p<0.05

Table 6 revealed the regression analysis on relationship between years of work experience and occupational hazards exposure among workers in food processing industries. The findings of the study revealed that there was a significant relationship between years of work experience and occupational hazards exposure [f(1,897) = 5462.32, p<0.05]. Therefore, the null hypothesis which stated that there is no significant relationship years of work experience and occupational hazards exposure among workers in food processing industries in Rivers State was rejected.

Table 7: Regression analysis on significant relationship between training and occupational hazards exposure

Model		Sum of Squares	df	Mean Square	F	Sig.	Decision
1	Regression	7109.141	1	7109.14	6178.83	.00*	**Rejected**
	Residual	1032.055	897	1.151			
	Total	8141.196^d	898				

*Significant, p<0.05

Table 7 revealed the regression analysis on relationship between training and occupational hazards exposure among workers in food processing industries. The findings of the study revealed that there was a significant relationship between training and occupational hazards exposure [f(1,897) = 6178.83, p<0.05]. Therefore, the null hypothesis which stated that there is no significant relationship training and occupational hazards exposure among workers in food processing industries in Rivers State was rejected.

Table 8: Regression analysis on significant relationship between job specification and occupational hazards exposure

Model		Sum of Squares	df	Mean Square	F	Sig.	Decision
1	Regression	6241.668	1	6241.66	2964.68	.00*	**Rejected**
	Residual	1886.387	897	2.10			
	Total	8128.056^d	897				

*Significant, p<0.05

Table 8 revealed the regression analysis on relationship between job specification and occupational hazards exposure among workers in food processing industries. The findings of the study revealed that there was a significant relationship between job specification and occupational hazards exposure [f(1,897) = 2964.68, p<0.05]. Therefore, the null hypothesis which stated that there is no significant relationship job specification and occupational hazards exposure among workers in food processing industries in Rivers State was rejected.

Discussion of Findings

The findings of this study showed that there was a very high negative relationship between knowledge and occupational hazards exposure (r = -0.97) which was statistically significant [f(1,897) = 14785.70, p<0.05]. This finding is encouraging because it is believed that knowledge is a prerequisite to any health behaviour or practice. It can be deduced from the findings of the study that as knowledge increases, occupational hazards exposures decreases, this is due to the fact that those who have knowledge about hazards, make effort to protect themselves from hazards thus, reducing their exposures to it. The finding of this study corroborates that of Sambo et al. (2012) whose study Zaria, North western Nigeria revealed that level of knowledge is a major determinants of occupational hazards exposure among workers. The finding of this study is in agreement with that of Sah et al. (2015) whose study in Sokoto, Nigeria reported that, all the workers had some basic knowledge about occupational safety which is protective against occupational hazards exposure. The result of the present study is in tandem with that of Alqurashi et al. (2019) which revealed that knowledge is a determinant of occupational hazards exposure. The finding of this study is also in line with that of Kisulu (2020) whose study carried out in Kenya revealed a significant relationship between knowledge and occupational hazard exposure. The finding of this study is also similar to that of Ismail et al. (2020) whose result in Ilorin, North Central Nigeria revealed a significant relationship between knowledge and occupational hazards exposure. The commitment of the mass media in disseminating information on health and general well-being might be implicated for the similarity found in the previous studies and the present one. Also, the contribution of various knowledge promoting materials in the society today may be implicated for the similarities found in the previous and present study. To buttress this, it has been

observed that, the society is fast growing in the aspect of knowledge and there is the expectation that more workers in the food, beverage and packaging industries are taking advantage of the technological innovations to access occupational safety related information.

Contrarily studies have affirmed that knowledge does not automatically translate to practice. The findings of this study is at variance with that of Manjula and De-Silva (2014) whose research on the factors influencing safety behaviours among workers in Sri-Lankan showed that knowledge and awareness were factors which constitute a barrier. The finding of the study it also at variance with that of Agbana et al. (2016) whose study on in Kwara State, Nigeria revealed a link between knowledge and safety practice. The finding of this study is different from that of Peter and Olasumbo (2014) where the knowledge of safety practices was found to be poor. The variation in the sample size and the study design might be implicated for the difference found in the two studies. The finding of this study is different from that of Adewale and Adhuze (2017) which showed that majority of the respondents have poor knowledge of occupational safety practices. This difference found between the present study and the previous one might be due to the difference in the study area, and the sample size. The findings of this study also differ from that of Vitharam et al. (2015) where poor knowledge of occupational safety was recorded. The fact that the previous study analysed data qualitatively whereas the present study analyzed the data generated quantitatively might be implicated for the variations found between the two studies.

The result of the study showed that there was a significant positive relationship between years of work experience and occupational hazards exposure [$r = 0.92$, $f(1,897) = 5462.32$, $p<0.05$]. The relationship being positive, indicated that as years of work experience increases, occupational hazards exposure also increases, this might not be disputed because, certain hazards and effects take its full course only when there is a long term exposure. Having long years of work experience might imply several years of exposure to occupational hazards inherent in that particular job. The finding of this study gives credence to that of Sambo et al. (2012) whose study Zaria, North western Nigeria revealed that years of work experience is a major determinants of occupational hazards exposure among workers. The finding of this study is also in agreement with that of Benedyk and Minister (2003) which revealed that years of work experience plays a significant role in the observance of precautionary measures. This similarity might be due to the homogeneity of the study respondents. However, the finding of this study is not in agreement with the studies of Mdejjo et al (2015) which showed that long years of work experience made workers to have full understanding and awareness about the activities and the nature of the service to render, thus, reducing their exposure to occupational hazards. Aluko et al (2016) affirmed that the median duration of work experience was 5 years, though over half (52.8 %) had worked for between 1 and 5 years. It is possible workers who have been working for at least five years are likely to be safe from hazards or things that are injuries to health. The result of this study is in credence with studies of Nkporbu et al, (2016) that workers with over 5 years of experience are less likely to be exposed by implication, it is because they have gathered much knowledge which makes them guide against the occupational hazards in their work.

The result of the study showed that there was a very high negative relationship between training and occupational hazards exposure ($r = -0.93$). This result is by implication showing that a worker

who have training will know better how to prevent occupational hazards exposure because of the training about occupational hazards and safety practices which are all important to keep oneself from hazards exposure. The finding of this study is in keeping with that of Adebola (2014) which showed that having higher training reduces occupational hazards and that there was a statistical significant relationship between training and practice of safety to prevent hazards exposure. This similarity might be due to the homogeneity of the study respondents. The similarity found in the present study and the previous ones might be due to the fact that training is helping to fill the gap in knowledge and the subsequent practice found among the respondents. However, the finding of this study is not in line with that of Abuga (2012) which showed that training had a positive and significant correlation with employee performance. The difference in the study location and sample sizes might be implicated for the variations found between the both studies.

The result of the study showed that there was a very high positive relationship between job specification and occupational hazards exposure (r = 0.87). The result further showed that job specification contributed 76% of the variance in occupational hazards exposure ($R^2 = 0.76$). This finding could be explained by the fact that the type of differs from one job specification to the other and some might be more hazardous than the others, which makes job specification to be statistically significant with occupational hazards exposure. The finding of this study is in tandem with that of Tezera et al. (2017) whose report showed a positive significant relationship between job specification and occupational hazards exposure. predictor of practicing safety measure to reduce hazards among permanent staffs as compared with casual workers. The finding of this study is in consonance with that of Mboingaba (2015) which also showed a significant relationship between job specification and occupational hazards exposures. This similarity found between the present study and previous one might be attributed to the fact that the types of work or activities embedded in each department or unit differs and it is such activities that determines the hazards exposure.

Conclusion
Based on the findings of the study, it was concluded that the safety practice is paramount to protecting workers from the deleterious effect of inherent hazards in the food processing industries however, factors such as availability of safety materials, training and job specification determined safety practices to a very high extent.

Recommendations
The following recommendations were put forward based on the findings of the study:
1. Professional organizations such as the National Industrial Safety Council of Nigeria (NISCN), the Institute of Safety Professionals of Nigeria (ISPON) and trade unions should organize periodic workshops and training programmes on occupational hazards and safety for the workers.
2. Safety personnel should organize safety training for workers in the food processing industries from time to time to keep them updated about current safety practices in the industry, this will help to sustain a good knowledge of safety among them.

3. The workers in food processing industries should make effort on their part to ensure they do not approach safety practices with negligence as such act could be detrimental to their health, thus, they must be very mindful of safety practices.
4. The workers in food processing industries should also make effort to attend training at regular interval to ensure they have up to date information about hazards and safety practices in their work.

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