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RISK ASSESSMENT AND PRACTICE OF OCCUPATIONAL SAFETY AMONG FOOD HANDLERS IN LAMINGO, JOS NORTH LOCAL GOVERNMENT AREA OF PLATEAU STATE

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ABSTRACT

Background: *Food handlers are people who work in a food facility and perform duties that involve the preparation, storage or serving the food. Due to the activities involved in cooking, they are exposed to various hazards. Little is known about knowledge and practice of occupational safety among food handlers in Jos, Plateau state*

Methods: *A cross sectional study was conducted in February 2017 among 73 food handlers. Quantitative data was collected on knowledge, risk assessment and occupational safety practices among the food handlers. Data was analysed using Epi Info 3.5.4.*

Results: *Only 13.7% of the respondents were found to have good level of knowledge of occupational safety and health, while more than half (60.3%) of the respondents were found to work in high risk environment, with 16.4% in low risk environment. There was a poor level of practice of occupational safety among 60.3% of the respondents. Respondents agreed that efforts towards occupational safety such as resource commitment, continuous safety training, availability of safety materials in different languages, comfortable work environment and facilities with regular maintenance as well as safety policy enforcement would improve occupational safety practices*

Conclusion: *This study revealed that majority of food handlers in Lamingo, Jos worked in high risk environment and in spite of this; there was a low level of knowledge and practice of occupational safety among them. Therefore, there is the need to improve work place safety and knowledge of occupational safety among food handlers. This can be achieved by conducting regular educational programmes and workshops about the importance of safety at work, and teaching the food handlers that occupational safety is also their responsibility, not just their employers alone.*

Key words: *food handlers, risk assessment, safety practices*

NTRODUCTION

Nigeria is experiencing a socio-demographic and health transition with increase inlife expectancy and more people migrating to the cities than before for job opportunities and education.[1,2] A number of people leave their homes in the morning to school or workplace in the day with the consequence that they outsource their feeding; breakfast and especially lunch to food handlers. Therefore food industry plays an important role in cities by meeting the financial and employment needs of the handlers up to 6% of the population, while meeting the food demands of the dwellers in the localities where they are found. It is estimated that food vending contributes up to 40% of the daily diet of urban consumers in developing countries such as

Nigeria.[3]This important industry has also provided employment to many.

Food handlers are people who work in a food facility and perform duties that involve the preparation, storage or serving the food in an eatery or restaurant.[4]These food handlers are sometimes exposed to various risks and hazards in their work place, yet the occupational health of food handlers are among the most understudied in the working population, with more emphasis placed on the safety of the food they handle and their customers than on the workers themselves.

Physical hazards are the most common hazards among food handlers. They include: heat, fire outbreaks, unsafe electrical wiring and shock risks, constant loud noise, poor lighting, vibrations, spills and tripping hazards. Biomechanical or ergonomic hazards occur when the type of work, body position and/or working conditions put a strain on the body. They are difficult to identify because their effects are chronic. These ergonomic hazards include unguarded machinery, exposed moving parts, improperly adjusted workstations and chairs, frequent lifting, repetitive or awkward movements. Chemical and dust hazards come from chemical preparation (solid, liquid or gas) while dust hazards result from inhalable materials in the work place such as cooking materials, cleaning products and solvents, vapours and fumes, dusts, carbon monoxide or other gases, gasoline or other flammable materials. Biological hazards come from working with people, animals or infectious plant materials which include blood or other bodily fluids, bacteria and viruses, insect bites, animal and bird droppings. Psychosocial hazards result from poor mental health and low job satisfaction, underemployment and other workplace social dynamics. It could also result from poor work organisation which causes stress.

The causes and consequences of poor safety at work are immediate and often relatively easy to deal with. Occupational diseases can be more difficult to spot. It may take a while for symptoms to develop so the connection between cause and effect is less obvious. In the United Kingdom, 1.5 million workers suffer from occupational diseases. In the food and drink industries specifically, an estimated 29 000 workers (4.8% of their workforce) suffered from occupational diseases during 2001-2002, according to the Self-reported Work-related Illness (SWI) Survey for those years.[5] In South Africa, as well as in the United Kingdom, the occupational diseases reported in the food industry in order of frequency include; biomechanical or ergonomic hazards which cause Musculoskeletal Disorders (MSDs) mainly comprising Work-related Upper Limb Disorders (WRULDs) and back injuries; work-related stress which can be caused by poor work organisation and psychosocial hazards; occupational asthma caused by inhalation of bakery and grain dusts; occupational dermatitis from hand washing, contact with foodstuffs etc.; rhinitis caused by irritant dusts such as bakery and grain dusts, spices and seasonings; noise-induced hearing loss where noise levels exceed 85dB.[6,7]

The objective of this study was to assess the risks food handlers are exposed to, and their knowledge and occupational safety practices.

METHODS

The study was conducted in Lamingo ward of Jos North Local Government Area. The ward is home to the permanent site of the Jos University Teaching Hospital (JUTH). This major tertiary healthcare facility has brought a bustle of activities to the otherwise quiet community of Lamingo. The various economic activities in Lamingo depend on

several food vending operations in the locality, and as such, there are several food vending operations in Lamingo, as well as several small scale restaurants.

The local population comprises a myriad of professions, traders, civil servants, farmers, students and JUTH staff. The study population comprised male and female workers irrespective of age, or position in the food vending operations within Lamingo who consented to participate in the study. A minimum sample size of 73 was calculated using appropriate formula for cross sectional study.[8]

A multistage sampling technique was used to select the participants. The first stage involved the selection of Lamingo ward purposively from the 20 wards in Jos North LGA. From the list of restaurants and food vending establishments in the ward, five were selected using simple random sampling technique by balloting. The third stage involved selection of respondents and all the consenting food handlers in the selected food vending establishments were selected and studied. Data were collected using a semi-structured, interviewer-administered questionnaire. The level of knowledge was graded using the questions and a score of 1 point was awarded to each correct option and 0 point for incorrect option to a maximum possible score of 17. Scores above 13 was recorded as good, 6-12 as fair and less than 6 as poor. The same method was used for the graded levels of risk assessment and practice but in each case, the total sum of items in the questionnaire section corresponding to each was used, dividing by 3 and graded as appropriate. The data collected was analysed using Epi-info software version 3.5.4.

RESULTS

Table 1 shows that the highest proportion of respondents (63.0%) was aged 21–30 years and 75.3% were females. Forty-one (56.2%) respondents were married and about half (54.8%) had secondary education while 21.9% had only primary level education. Forty-two (57.5%) respondents were cooks, making them the largest group among the food handlers followed by stewards (24.7%) and head chefs (12.3%). Majority of the respondents (67.1%) had spent between two and five years of service in the food industry.

Table 1: Socio-Demographic Characteristics of Respondents

Variables	Freq. (%) n=73
Age (yrs)	
≤20	2(2.7)
21 – 30	46(63.0)
31 40	18(24.7)
>41	7(9.6)
Sex	
Female	55(75.3)
Male	18(24.7)
Marital Status	
Married	41(56.2)
Single	32(43.8)
Education	
None	3(4.1)
Primary	16(21.9)
Secondary	40(54.8)
Tertiary	14(19.2)
Duty	
Cook	42(57.5)
Waiter/Steward	18(24.7)
Head Chef	9(12.3)
Others*	4(5.5)
Work Experience (yrs)	
= 1	15(20.5)
2 -5	49(67.1)
= 6	9(12.3)

*Others - porter, cashier, manager, owner (At other times prepare, cook and serve food).

The most common occupational hazards mentioned by the workers as shown in Table 2 were sharp objects (91.7%), fall from heights (87.5%), falling objects (65.3%), slippery floor (62.5%), and electric shock (51.4%). Occupational health problems mentioned include cuts (91.7%), scalding/burns (77.8%), other severe injuries such as deep lacerations (58.3%), cancers (24.7%) and heart disease (11.0%). Forty-six (63.0%) respondents reported family, friends and the news media as their sources of occupational health information, while 15.1% respondents reported getting their occupational health information from workshops and occupational safety department at work.

Forty-seven (64.4%) respondents believed that the responsibility for occupational health and safety was the employer's while 28.8% believed that it was the employee's and only 6.8% reported that the government was responsible for occupational safety and health. Fifty-eight (79.5%) respondents would go to doctors for assistance with their occupational safety and health concerns. Nine (12.3%) of the respondents would go to their supervisors while 8.2% would go to their colleagues and trade unions. Stable income was the most easily identifiable occupational concern of the respondents as reported by 26.0% respondents. This was closely followed by job security (17.8%), then job satisfaction 13.7% and 12.3% for safe working environment as their primary concern. Thirty-four (46.6%) respondents had a fair knowledge of occupational safety and health and 13.7% had good knowledge.

In majority of the kitchens visited, emergency route indications (65.8%), exit signs (64.4%), smoke doors (58.9%) and safety promotion posters and notices (58.9%) were completely absent. Where they were present, the proportion that was in good conditions was17.8%, 24.7%, 12.3%, and 11.0% respectively.

Table 2: Knowledge of occupational safety and health among respondents

Variable	Freq. (%) n= 73
Knowledge of occupational hazards*	
Sharp objects	67(91.7)
Fall from heights	64(87.5)
Falling objects	48(65.3)
Slippery floor	46(62.5)
Electric shock	38(51.4)
Striking against stationary object	38(51.4)
Injury by animals	11(15.3)
Air pollution	4(5.5)
Knowledge of occupational health problems*	
Cuts	67(91.7)
Scalding/Burns	58(77.8)
Severe Injuries (deep lacerations)	43(58.3)
Accidents	19(26.0)
Cancers	17(24.7)
Heart disease	8(11.0)
Others**	24(32.9)
Sources of safety information	
Friends, family, news	47(64.4)
Workshop & occupational safety department	26(35.6)
Who to be responsible for occupational safety	
Employers	47(64.4)
Employees	21(28.8)
Government	5(6.8)
Who to contact for occupational health & safety assistance	
Doctors	58(79.5)
Supervisors	9(12.3)
Colleagues	5(6.8)
Trade unions	1(1.4)
Level of knowledge of occupational safety	
Good	10(13.7)
Fair	34(46.6)
Poor	29(39.7)

*Multiple responses allowed
**skin disease, lung disease

The graded assessment of the work place environment showed that 60.3% respondents worked in a high risk environment, 23.3% worked in a moderate risk environment, and only 16.4% worked in a low risk environment. The hazards present in the work place are listed in Table 3.

Table 3: Graded assessment of work place environment of respondents

Variables (n=73)	Absent (%)	Poor (%)	Fair (%)	Good (%)
Condition of housekeeping				
State of drainage and sink	24 (32.9)	16 (21.9)	17(23.3)	16 (21.9)
Condition of electrical safety	12 (16.4)	7 (9.6)	31 42.5)	23 (31.5)
Condition of exits	13 (17.8)	21 (28.8)	22 30.1)	17 (23.3)
Condition of smoke doors	43 (58.9)	17 (23.3)	4 (5.5)	9 (12.3)
Condition of exit signs	47 (64.4)	6 (8.2)	2 (2.7)	18 (24.7)
Emergency route indication	48 (65.8)	6 (8.2)	6 (8.2)	13 (17.8)
Condition of floor	11 (15.1)	14 (19.2)	24(32.9)	24 (32.9)
State of floor (has antiskid material)	38 (52.1)	14 (19.2)	8(11.0)	13 (17.8)
Condition of floor stains	21 (28.8)	15 (20.5)	13(17.8)	24 (32.9)
Classified storage of materials	20 (27.4)	19 (26.0)	21(28.8)	13 (17.8)
Stockpiling of materials	26 (35.6)	18 (24.7)	14(19.2)	15 (20.5)
Separate storage of chemical and food	28 (38.4)	10 (13.7)	12(16.4)	23 (31.5)
State of manual handling operations	24 (32.9)	11 (15.1)	19(26.0)	19 (26.0)
Condition of knife tools	11 (15.1)	11 (15.1)	29(39.7)	22 (30.1)
Labeling of chemicals	39 (53.4)	11 (15.1)	12(16.4)	11 (15.1)
Storage of chemicals far from fire source	41 (56.2)	11 (15.1)	9(12.3)	12 (16.4)
Well established ventilation equipment	34 (46.6)	15 (20.5)	9(12.3)	15 (20.5)
Stoves with ventilation installation	39 (53.4)	15 (20.5)	10(13.7)	9 (12.3)
Cleanliness of ventilation system	39 (53.4)	12 (16.4)	8(11.0)	14 (19.2)
Safety promotion posters and notice	43 (58.9)	11 (15.1)	11(15.1)	8 (11.0)
Workplace risk assessment	Freq. (%)			
High risk	44 (60.3)			
Moderate risk	17 (23.3)			
Low risk	12 (16.4)			

Table 4 showed that only 19.2% respondents had a good level of practice of occupational safety while 60.3% respondents had a low level of practice. Most of the respondents 71.2 % did not receive general safety training at work. Fifty-seven (78.1%) respondents reported not practicing impromptu safety drills at work and 78.1% used Personal Protective Equipment (PPEs) such as wearing working uniforms at work (78.1%), plastic gloves (54.8%), aprons (45.2%) and cut resistant gloves (21.9%).

Table 4: Practice of occupational safety among respondents

Variables	Freq.(%) n= 73
Had general safety training at work	
No	52(71.2)
Yes	21(28.8)
Had job specific training	
No	53(72.6)
Yes	20(27.4)
Had impromptu safety rehearsals and fire drills	
No	57(78.1)
Yes	16(21.9)
Uses PPE	
No	16(21.9)
Yes	57(78.1)
PPEs used	
Working uniform	57(78.1)
Plastic gloves	40(54.8)
Apron	33(45.2)
Cut resistant gloves	16(21.9)
Cotton gloves	15(20.5)
Plastic boots	11(15.1)
Practice of occupational safety	
Low	44(60.3)
Fair	15(20.5)
Good	14(19.2)

DISCUSSION

The most common occupational hazards and health problems mentioned in this study were related to the production aspect of food vending- cooking, with almost all the respondents reporting use of sharp objects like knives and cuts as a work place hazard and health problem respectively. This is similar to findings from a study conducted among kitchen workers in Finland who revealed that the most commonly occurring accident during kitchen work was a wound to the fingers caused by a knife when cutting.[9] However, these findings were different from that of a study conducted in California among young restaurant workers among which a third of the respondents in that study reported that intense heat, and another 34.8% reported lack of safety training as the most frequent occupational hazards they were exposed to.[10]

The proportion of respondents who mentioned burns/scalding in our study was however higher. Other hazards mentioned were related to the daily repetitive moving around and moving things from place to place such as slips and falls. The knowledge of occupational safety helps to understand the different components that affect the practice of it. A graded assessment of the knowledge of occupational safety and health from this study showed that only 13.7% of the respondents had sufficient good knowledge of occupational safety and health, while almost half had a fair knowledge and 39.7% of the respondents had poor knowledge. This could be as a result of the belief among majority (64.4%) of the respondents that the responsibility for occupational safety practices rested with the employers, and not with the employees. It could also result from the "common sense" approach to personal preservation that is not rooted in any technical knowledge of occupational safety and health but which has been shown to be common among employees of small organizations where the safety climate (the general perception of occupational health, attitude and practice within an organization) is low as found in a study conducted to determine the safety climate of industrial organizations.[11]

The doctor is the most prominent health care personnel but is only one of many of the professionals that make up the healthcare team especially in Nigeria, so it was not surprising to find that majority (79.5%) of the respondents chose the doctor as the personnel whom they would approach in case of any assistance related to occupational safety and health. Most of the respondents did not have a specified source of information concerning occupational safety, and this also points to the largely informal organization of this sector in the study location and overall low safety climate which was similar to the findings of the study of safety climate of industrial organizations.[11] From our study, we found that a third of the respondents did not report any employment concern while about a quarter reported that a stable income was their most pressing employment concern.

A graded work place risk assessment showed that 60% of the respondents worked in a highly hazardous environment and only 16.4% worked in a low hazardous environment. The work place assessment also revealed that some common safety fixtures such as emergency route indications, exit signs, smoke doors and safety promotion posters and notices were nowhere to be seen in a majority of the places assessed. This was because the food handlers did not seem to have purpose built facilities and workstations. We think this may be related to the fact that most of the respondents were small-scale food handlers with less than 50 employees at each location, and these fixtures cost a lot to install.

Food vending involves an offshoot of a daily home activity which is cooking with the only difference being a change in scale. The change in scale means that they cook food more often and are therefore exposed to hazards more frequently than they are at home, yet these respondents did not seem to practice occupational safety methods at work more than what they did at home. According to this study, majority had poor safety practices and only 19.2% had a good level of practice of occupational safety as evidenced by the finding that even though cuts were the most common (91.7%) health problems encountered, only 21.9% of the respondents used cut resistant gloves.

The use of working uniforms was high (78.1%) and this could be because they are required at work for the purpose of easy identification of the staff by the customers. This means that if occupational safety

methods were demanded and enforced at their work places, the level of practice would improve. This was further reinforced by 43.8% of the respondents who reported that enforcement would improve practice against the 23.3% that disagreed. Similarly, majority believed that occupational safety was up to the employers and only 28.8% of the respondents reported that it was up to the employees. These findings were similar to the findings of the study[11] on the safety climate of industrial organizations which showed that safety practices at work were determined largely by two main dynamics namely, worker's perceived attitude of management towards safety and worker's perception of importance of safety at work on a personal level. According to the study, 71.2% reported receiving no form of safety training at work, and a similar proportion reported not practicing impromptu safety rehearsals. This continues the tradition of leaving the responsibility of occupational safety and health to the employers. It was therefore not surprising to see that 85% of the respondents agreed that administration commitment to occupational safety would greatly improve occupational safety practices.

According to our results, efforts towards occupational safety such as resource commitment, continuous safety training, availability of safety materials in different languages, comfortable work environment and facilities with regular maintenance as well as safety policy enforcement would improve occupational safety practices and these responsibilities are primarily that of the employers. Even though it is easy to leave the responsibility of occupational safety in the hands of the employers, employees must also be held accountable but unfortunately in this study, it has been revealed that this is not the case as there was not a convincing use of PPE by the respondents.

CONCLUSION

This study revealed that food handlers in Lamingo area of Jos North Local Government Area were predominantly young people in their twenties with at least a secondary level of education, with more females than male. The study also revealed that the respondents have a poor knowledge of occupational safety and health and majority of them were frequently exposed to a high risk environment at work. In spite of this, there was a low level of practice of occupational safety. Based on these findings, we recommend that employers of food handlers should provide safer working environment by instituting and enforcing safety policies in the workplaces as well as encouraging employees to practice occupational safety. Intensive and obligatory occupational safety training for all employees and employers should be provided by well-trained occupational health and safety consultants.

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References

1. World Health Organization (WHO). Country health profiles: Nigeria. [Online].; 2015 [cited 2016 Oct 19]. Available from: http://www.afro.who.int/en/nigeria/country-health-profile.html.
2. Central Intelligence Agency. World Fact Book. [Online].; 2014 [cited 2015 Oct 19. Available from: https://www.cia.gov/library/publications/the-world-factbook/geos/ni.html.
3. Emmanuel A, Mangai JM, Kayong EA, Afobi BB, Goshit JD, Nanman K, et al.

Assessment of practice of food safety and hygiene among food vendors within Jos North Local Government Area of Plateau State, Nigeria. International Journal of Medical and Health Research. 2015;1(2):83-86.

4. Food Safety and Inspection Service. Fact sheets. [Online]. 2016 [cited 2018 Feb 9]. Available from: https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets
5. Health and Safety Executive. A recipe for safety. [Online]. 2002` [cited 2016 Nov 9. Available from: http://www.hse.gov.uk/food/occhealth.pdf.
6. Cullman P, Cook A, Nieuwenhuljsen MJ, Sandford C, Tee RD, Venables K, et al. Allergen and dust exposure as determinants of work-related symptoms and sensitization in a cohort of flour-exposed workers; a case–control analysis. Annal of Occupational Health. 2001;45(2):97-103.
7. Department of Labour, Republic of South Africa. Health and safety in the food and beverage industry. [Online]. 2015 [cited 2016 Nov 9]. Available from: http://www.labour.gov.za/DOL/downloads/documents/useful-documents/occupational-health-and-safety/Useful%20Document%20-%20OHS%20%20Occupational%20Health%20and%20Safety%20in%20the%20food%20and%20beverage%20industry.pdf
8. Ogbonna C. Research methodology. In: The basics in biostatistics, medical informatics and research methodology. 1st ed. Jos: Yakson Press. 2014. p 227.
9. Pekkarinen A, Anttonen H, Niskanen J. Assessment of health risks in canteen kitchens. International Journal of Occupational Safety and Ergonomics. 1996; 2(3):262-267.
10. Taylor A, Pullen BA, Pullen A. Young workers united: occupational hazards for restaurant workers in San Francisco. [Online]. 2010 [cited 2017 Nov 9]. Available from: http://lohp.org/wp-content/uploads/2013/09/resturaunt_workers.pdf
11. Zohar D. Safety climate in industrial organizations: theoretical and applied implications. Journal of Applied Psychology. 1980;65(1):96-102.