

Knowledge of occupational hazards, and safety practices among butchers in Kano metropolis, Kano State, Nigeria

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Abstract

Abattoir work is associated with significant public health hazards that result in occupational related diseases or aggravate the existing ill-health of non-occupational origin. This study assessed knowledge of occupational hazard, safety and hygienic practices among butchers in Kano Metropolis. Descriptive cross-sectional study design was used to study 321 respondents in Kano metropolis. Data was collected using semi-structured interviewer administered questionnaire and analyzed at univariate, bivariate and multivariate levels using IBM SPSS version 22. The mean age of the respondents was 37.7±10.5 years. More than a third (35.8%) of the respondents were between the age ranges of 30 to 39 years. Overall, more than three-quarters 241 (75%) of the respondents had good knowledge of occupational hazard, cut/injuries was known by most of the respondents 309 (96.3%), while getting secondary infections from sustained wound and contracting diseases from infected animals were known by 241 (75.1%) and 211 (65.7%) of the respondents respectively. There was statistically significant association between knowledge of occupational hazard and having at least primary education ($P=0.003$), being in meat business for between 6 to 10 years ($P=0.048$) and self-learning of meat business (0.005). Respondents with formal education were 24% more likely to have good knowledge of occupational hazard [AOR=1.24, 95% CI (1.02-1.50)]. Being in meat business for at least 6 years was associated with 95% increase in knowledge of occupational hazard [AOR=0.95, 95% CI (0.58-1.55)]. Self-learning of butchering was associated

with 70% increased likelihood [AOR=0.7, 95% CI (0.39-1.11)] of having good knowledge. Butchers selling meat in the restaurant were 7 times more likely to observe safety practices [AOR=6.9, 95% CI (2.24-21.01)]. This study revealed a good knowledge of occupational hazard among the butchers which is influenced by having formal education, duration in, and self-learning of the business, but safety practice was fair. Therefore, underscores the importance of formal training and supervision of butchers by relevant stakeholders to promote safety and hygienic practices. Government should therefore ensure regular training and supervision of butchers to promote safety and hygienic practice in order to prevent diseases.

Introduction

Work has its positive health-promoting effects, such as the financial dividend providing the worker with the basic necessities of life. There is, however, a reciprocal and interactive relationship between workers and the work environment. Although knowledge of these interactions between work and health is fundamental in understanding and practice of occupational health and safety, the importance of safety at the workplace is often overlooked.¹⁻³

Abattoir work is associated with health hazards that could result in occupational diseases or may aggravate the existing ill health of non-occupational origin,⁴ with zoonosis gradually becoming a major global threat to public health and animal welfare.^{5,6} Occupational infections mostly contracted by abattoir workers could be caused by iatrogenic or by transmissible agents, including viruses, bacteria, fungi, and parasites; and their toxins.⁴ Again, while manipulating body parts of large animals and lifting heavy equipment, workers could stress their muscles and joints, thus subjecting them to severe physical stress and pain, predisposing them to musculoskeletal disorders and other ailments.⁴ About 250 million cases of occupational injuries and illnesses occur annually worldwide, with prevalence studies from Botswana, Zimbabwe, Zambia, Ghana and Nigeria suggesting a high occurrence of occupational disease in Africa.³

The number of occupational infections that occur each year is largely unknown as a result of underreporting especially in developing countries.⁷ It has been estimated that over 120 million occupational accidents with over 200,000 fatalities occur each year in these countries. Sub-Saharan Africa appears to have the highest rate followed by

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Asia.⁸ In Ethiopia there were an estimated 4.3 million occupational accidents with over 5596 fatalities annually. This gave accident and fatality rate of 16,426 and 21.5 per 100,000 workers, respectively.⁸ Multiple surveys, however, have confirmed that 20% of human sicknesses and deaths in some African countries are due to zoonosis, thus African countries constitute 70% of global hotspots for the prevalence of endemic zoonotic diseases.⁹ Many Nigerians are at risk of contracting abattoir zoonoses through consumption of contaminated meat, and more vulnerable to these are the abattoir workers without protective apparels, leading to exposure to occupational hazards, thus stressing the need for legislations to be put in place by the Government.⁹

In Nigeria, abattoir workers constitute a major group at risk of contracting occupational zoonoses, due to the close contact existing between them and animals/tissues during slaughter and processing.¹⁰

The working conditions, hygiene and operations of slaughterhouses in most African countries; especially Nigeria, parts of Kenya and Tanzania have not been in compliance with the recommendations of World Trade Organization (WTO), World Organization for Animal Health (OIE), World Health Organization (WHO), Food and Agriculture Organization (FAO) and Codex Alimentarius Commission (CAC), unlike the abattoirs in Europe; where consumers are protected from food-borne zoonoses, by adoption of an integrated approach

to food safety from farm to the fork through risk assessments and risk management practices.⁹ To ensure proper control of occupational health hazards among the abattoir workers, standard design and good environmental hygiene must be taken into consideration all the time. The use of Personal Protective Equipment (PPE) and other preventive measures should be strongly encouraged. The abattoir management should entail the use of safer equipment that are easy to clean and decontaminate, as well as routine cleaning of all working equipment and surfaces, routine medical surveillance and diagnostic investigations on possible risk exposure to occupational health hazards be conducted as they are important disease control measures. Animal owners and handlers, especially those at risk of lacerations and cuts at their workplaces, should be educated on the importance of vaccinations to prevent them from contracting zoonotic diseases.⁴

The butcher's knowledge and awareness about the hazards of improper meat processing and handling, is essential to safeguard their health as well as the health of the community.¹¹

This study therefore aimed to ascertain the knowledge occupational hazards, safety and hygienic practices of butchers in Kano Metropolis with a view of identifying the ways to prevent them. This study can be used to sensitize stake holders so that they can provide support and resources necessary to reduce occupational hazards and improve on safety and hygiene.

Materials and Methods

Study area/Setting

The study was carried out in major abattoirs within Kano metropolis. Kano State is located in Northwestern Nigeria. It consists of forty-four (44) Local Government Areas (L.G.As) and had a projected population of 13,065,294 in 2017.¹²

The Kano metropolis comprises of eight Local Government Areas; Kano Municipal, Fagge, Dala, Gwale, Tarauni, Nassarawa, Ungoggo and Kumbotso. The total land area of Metropolitan Kano is 499 square kilometers with 2,163,225 people as 2006 national population census living within the metropolis using a growth rate of 3.1% per annum. Kano state, had a projected total population of 11,215,688 in 2012 and 13,065,294 in 2017.¹² There are three major abattoirs namely [kwari or kofar wambai], Unguwa uku, and Mil tara/Bachirawa, within which animals for consumption are slaughtered daily for purchase by butchers from different parts of the metropolis.

Animals are examined locally at the abattoir by the appropriate authority before recommending and eventual slaughter for meat business activities. The butchers in the abattoirs have permanent stations where they engage in the sale of raw meats to both consumers and butchers involved in meat retail activities

Study design

Descriptive cross-sectional study design was used.

Study population/Inclusion criteria

The study population comprised of all the butchers in Kano metropolis who have been in the meat business for at least 6 months and are older than 18 years of age. Butchers not in the abattoir during the data collection were excluded.

Sample size determination

A sample of 321 was determined using an appropriate formula for estimating minimum sample size for descriptive studies.¹³

$$n = \frac{Z^2 pq}{d^2}$$

Standard normal deviate (z) 1.96 at 95% confidence interval and margin of error (d) 0.05 and prevalence (p) from previous study,¹⁴ point prevalence rates of Work-Related Muscular Skeletal Disorders (WRMSDs) among butchers, 74.5%= 0.745 obtained from a past study and a non-response rate of 10% were used to compute the sample size.

Sampling technique

Cluster sampling technique was used for the selection of respondents. The list of the major abattoirs in Kano metropolis was obtained from the Kano state ministry of environment and included; Abattoir (kwari or kofar wambai), Unguwa uku and Mil tara/Bachirawa.

Each of the Abattoirs was considered as a cluster and respondents were equally allocated to consist of 107 respondents in each cluster. All respondents were interviewed in each cluster until the required sample size of 107 was obtained.

Instrument of data collection

Interviewer administered semi-structured questionnaire with open and close ended questions adapted from previous study¹³ was used to collect data from eligible respondents. The questionnaire consisted of three sections that elicited information on the respondent's socio-demographic

data, knowledge of occupational hazard and safety practices among the respondents.

The questionnaire was pretested among 40 butchers in their respective places of business in Kumbotso town. The questionnaires were administered by 9 trained Hausa speaking research assistants and interviews were conducted in Hausa.

Data management and analysis

Data was analyzed using IBM SPSS

Table 1. Distribution of socio-demographic characteristics of the respondents.

Characteristics	Frequency (n=321)	%
Age (years)		
10-19	1	0.31
20-29	78	24.30
30-39	115	35.83
40-49	77	23.99
50-59	41	12.77
≥60	9	2.80
Marital status		
Single	77	23.99
Married	236	73.52
Widowed	6	1.87
Divorced	2	0.62
Ethnicity		
Hausa	314	97.82
Fulani	5	1.56
Igbo	1	0.31
Yoruba	1	0.31
Level of education		
No education	14	4.36
Primary	161	50.16
Secondary	53	16.50
Tertiary	11	3.43
Qur'anic only	82	25.55
Monthly income (naira)		
1,000-50,000	217	67.60
51,000-100,000	91	28.35
101,000-150,000	9	2.80
151,000-200,000	3	0.93
>200,000	1	0.31
Duration of work experience (years)		
1-5	20	6.23
6-10	44	13.71
>10	257	80.06
Hours of work per day		
1-6	130	40.50
7-12	184	57.32
≥13	7	2.18
How meat preparation was learnt		
Catering school	2	0.62
Parents	269	83.80
Friends	29	9.03
Self	17	5.30
Others	4	1.25
Type of meat vending		
Restaurant	2	0.62
Meat stall	29	9.03
Open space	280	87.23
Raw meat only	10	3.12

Statistics for Windows, Version 22 at univariate, bivariate and multivariate levels. Quantitative variables were summarized using appropriate measures of central tendency and dispersion while categorical variables were presented as frequencies and percentages. The dependent/outcome variables are knowledge of occupational hazard and safety practice and while the independent variables are age, highest educational status, tribe, marital status, among others.

Ten questions on Knowledge of occupational hazards were asked, a correct response was scored one point while a wrong response was allocated a zero point. Respondents with knowledge score of (0-3.3), (3.4-6.7) and (6.8-10) were considered to have poor, fair and good knowledge of occupational hazards respectively. Knowledge score of occupational hazards was converted to proportion by dividing the score by (10) and multiplied by hundred then categorized into poor, fair and good (0-33%, 34-67% and >67%) respectively.

Twenty-seven questions were asked to assess safety practices among the respondents. Correct answer to each question was awarded one point while wrong response was allocated a zero point. Scores of (0-13.7), (>13.7-27.3) and (≥ 27.4) were considered poor, fair and good safety practices respectively. One-way analysis of variance (ANOVA) was used to test for significant association between numerical variables and compared means in more than two groups. Ordinal logistic regression was used to adjust for confounders using the categories calculated based on individual scores. This was aimed at determining the predictors of knowledge of occupational hazards and safety practices. A P-value of ≤ 0.05 was considered significant. The criteria for inclusion of variable into the ordinal logistic regression model were *a priori* variable, variables significant on bivariate analysis, and a set $P \leq 0.1$ for variables that were not significant in bivariate analysis.¹³

Ethical considerations

Ethical approval was obtained from Kano State Health Research Ethics Committee of Kano State Ministry of Health with approval number of MOH/OFF/797/T.I/787, and advocacy visit was conducted to the leadership of each abattoir during which relevance of the study was explained to them for their cooperation. Data was collected from August to October 2018. All the principles of research ethics were respected throughout the conduct of the research. Consent form was translated to local language (Hausa), literate respondents indicated acceptance by signing the form while the non-literate affixed their thumbprints.

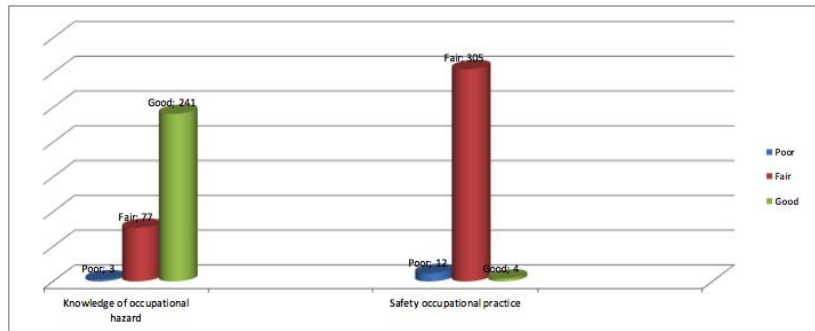


Figure 1. Knowledge of occupational hazard, safety and hygienic practice grade of the respondents.

Table 2. Positive responses to knowledge of occupational hazard and safety practices questions.

Butcher's knowledge of occupational hazard	Frequency (n=321)	%
Do you think there are hazards associated with your work?	294	91.59
Which of the following is negatively associated with your work?		
Cut/injuries	309	96.26
Fall from height	292	90.97
Inhalation of chemicals	293	91.28
Contracting diseases from infected animals	211	65.73
Getting secondary infection from the wound sustained	241	75.08
Slipping from wet floor	292	90.97
Musculoskeletal pain	303	94.39
Animal bite	122	38.01

Table 3. Butchers positive responses to safety practices.

Butcher's safety practices	Frequency (n=321)	%
Do you carry out meat inspection	312	97.2
Do you practice medical examination	70	21.8
As a meat handler, when should you routinely go for medical check-ups?		
When sick	304	94.70
Quarterly	9	2.80
After every six months	6	1.90
Yearly	6	1.90
Under which of the following conditions do you wash your hands?		
Before commencement of meat preparation?	293	91.3
After preparation of meat:	278	86.6
Before serving each customer:	45	14.0
After touching money:	74	23.1
After visiting the toilet	308	96.0
After handling refuse	298	92.8
If Yes in any above, with what	114	35.5
How often do you clean your work surfaces	13	4.5
How often do you wash your meat preparation utensils	12	3.7
With what do you clean cooking utensils	273	85.1
Which of the following are practice(s) you use while serving your customers?		
Nylon bag	299	93.2
Sheet of papers	298	92.8
Plates/dishes	1	0.31
How do you treat solid waste from your trade?	29	9.0
How do you treat liquid waste from your trade?	215	67
In case you are sick, do you work?	276	86
If no above, what kind of sickness makes you stay at home and not handle meat?		
Fever and headache	269	83.8
Cough/sore throat	15	5.0
Diarrhea	51	16.0
Skin conditions	3	1.0
Others	6	2.0

Results

Socio-demographic characteristics of the butchers

The mean age of the respondents was 37.7±10.5 years. More than a third (35.83%) of the respondents was between the age ranges of 30 to 39 years. Almost all the respondents were males and Hausa/Fulani by tribe (>99%). Married

respondents constituted more than two-thirds (73.5%) and about one-half (50.2%) had primary education as the highest educational qualification. More than two-thirds (67.6%) of the respondents had an estimated monthly income of between one thousand to fifty thousand naira with majority (80.1%) having been in the business for more than ten years. More than half (57.3%) use to work for between 7 to 12 hours daily. Most of the butchers (83.8%)

learnt meat preparation from their parents and conducts the business in an open space (87.2%) (Table 1).

Butcher's knowledge of occupational hazard

The mean knowledge score was 7.4±1.4. More than three-quarters of the respondents had good knowledge 241 (75%) of occupational hazard as shown in Figure 1. Risk of cut/injuries was known by

Table 4. Factors associated with knowledge of occupational hazard and safety occupational practices.

Characteristics	n=321	Knowledge of occupational hazard		Logistic regression		Safety practices		Logistic regression	
		Mean±SD	P-Value	Adjusted OR (95%CI)	P-Value	Mean±SD	P-Value	Adjusted OR (95%CI)	P-Value
Age (years)									
10-19	1	7±0.00				16.0±0.0			
20-29	78	7.4±1.6	0.7			12.0±3.2			
30-39	115	7.5±1.1				12.0±2.2	0.4		
40-49	77	7.2±1.5				12.4±2.2			
50-59	41	7.3±1.4				12.4±2.2			
≥60	9	7.1±1.3				13.1±2.9			
Marital status									
Single	77	7.4±1.5				12.2±2.5			
Married	236	7.4±1.3	0.8			12.2±2.5	0.7		
Widowed	6	6.8±1.2				11.0±1.8			
Divorced	2	7.5±2.1				12.5±0.7			
Ethnicity									
Hausa	314	7.4±1.4				12.2±2.5			
Fulani	5	7.4±1.5	0.8			13.4±3.8	0.7		
Igbo	1	6.0±0.0				13.0±0.0			
Yoruba	1	7.5±2.1				12.0±0.0			
Education status									
No education	14	7.6±1.6				12.4±1.5			
Primary	161	7.6±1.1				12.0±2.5			
Secondary	53	7.1±1.7	0.003*	1.24 (1.02-1.50)	0.03*	12.9±2.1	0.1	1.2 (0.8-1.75)	0.4
Tertiary	11	6.7±2.4				12.8±2.6			
Quranic only	82	7.0±1.3				12.0±2.6			
Monthly income (naira)									
1,000-50,000	217	7.4±1.4				12.2±2.8			
51,000-100,000	91	7.3±1.2				12.2±1.5			
101,000-150,000	9	8.1±1.4	0.4			12.3±2.3	0.3		
151,000-200,000	3	7.0±1.0				13.0±1.7			
>200,000	1	6.0±0.0				7.0±0.0			
Duration in business (years)									
1-5	20	7.2±1.2				12.2±1.8			
6-10	44	7.8±0.9	0.048*	0.95(0.58-1.55)	0.8	11.9±3.2	0.7		
>10	257	7.3±1.4				12.3±2.4			
Hours of work per day									
1-6	130	7.2±1.5				12.4±2.3			
7-12	184	7.5±1.2	0.06	0.6(0.36-0.99)	0.045*	12.0±2.6	0.2	1.9 (0.69-5.02)	0.2
≥13	7	8.0±0.8				13.4±1.6			
How meat preparation was learnt									
Catering school	2	6±1.4				11.5±5.0			
Parents	269	7.3±1.4				12.2±2.6			
Friends	29	7.4±1.2	0.005*	0.7(0.39-1.11)	0.12	12.3±1.3	1.0		
Self	17	8.1±0.6				11.9±1.4			
Others	4	6.3±1.5				12.5±3.7			
Type of meat vending									
Restaurant	2	7.0±1.4				14.0±2.8			
Meat stall	29	6.8±1.5				13.8±3.3	0.003*	6.85 (2.24-21.01)	0.001*
Open space	280	7.4±1.3	0.088	0.51(0.27-0.98)	0.045*	12.0±2.3			
Raw meat only	10	6.9±1.2				12.0±2.3			

*Statistically significant

most of the respondents 309(96.3%), however, getting secondary infections from sustained wound and contracting diseases from infected animals were known by 241 (75.1%) and 211 (65.7%) of the respondents respectively as shown in Table 2.

Occupational safety practice

The mean occupational safety practice score among the respondents was 12.2 ± 2.5 . Majority of the butchers 305 (95.0%) had fair safety practice as shown in Figure 1.

All the respondents used bare hands in handling meat. None of the respondents correctly responded to question on how left-over meat is being handled. Majority of the respondents 304 (94.7) seek medical examination only when sick as shown in Table 3.

Discussion

Safety and hygienic practices among butchers are important in the prevention of food-borne diseases associated with consumption of contaminated meat and preventing butchers from zoonosis and other hazards associated with their occupation. This will be achieved only when the butchers have sound knowledge of the hazards they are exposed to and how to protect consumers from various infection that can be traced to their poor personal and meat hygienic practices

More than three-quarters of the respondents in this study were found to have good knowledge 241 (75%) of occupational hazard. Cut/injuries was known by most of the respondents 309 (96.3%), however, getting secondary infections from sustained wound and contracting diseases from infected animals were correctly answered by 241 (75.1%) and 211 (65.7%) of the respondents respectively. The knowledge of zoonosis was slightly higher than what was obtained in India, that identified 60% of butchers to be aware of zoonotic diseases.¹⁵ Much lower level of knowledge of 46.7% was also identified in another study.¹⁶ Having better knowledge of being at risk of infection therefore will promote safety practices by the butchers thereby protecting them from negative consequences associated with non-compliance, their family and the community at large.

This study identified that, having at least primary education is associated with 24% increased likelihood of having good knowledge of occupational hazard [AOR=1.24, 95% CI=(1.02-1.50)] and this may be explained by possibility of learning in school and reading on diseases associated with their occupation (Table 4).

In comparison with a study that found

majority 88.09% of meat handlers to wash their hands after handling waste and 97.62% after using the toilet,¹⁷ almost the same (96.0%) identified hand washing after visiting the toilet as a key condition to observe hand washing in this study, and practiced by only 14% of the respondents after serving each customer which was half of 32.73% of what was obtained among the respondents that accepted no substitute for hand washing in promoting meat safety and hygiene.¹⁶

A study conducted in India found 51.7% and 68.3% of meat handlers to opined that they will continue their work when having eczema or diarrhea,¹⁶ these findings were better than what was identified in this study with only 1% and 16% of the respondents staying at home when having skin infection and diarrhea respectively.

A high proportion (62.64%) of animal handlers admitted to not wearing protective clothing during slaughter¹⁸ and the meat may be contaminated in a situation where there is poor compliance with hand washing in addition to contracting zoonosis.

Less than one-quarters (21.8%) of the respondents in this study responded to conducting medical examination in comparison with what was obtained in Ethiopia that showed 15.4% of the abattoir workers have no health certificate.¹⁹ A study conducted in Ghana indicated that using caps, masks, protective gloves and proper clothing can minimize the risk of contamination,²⁰ this is in addition to medical examination. The need for training was highlighted in ensuring improved knowledge and safety practices among meat handlers.^{21,22}

The finding of this study found a statistically significant association between knowledge of occupational hazard among butchers and being in meat business for between 6-10 years ($P=0.048$), self-learning of meat business ($P=0.005$). In addition, working for at least 13 hours in 24 hours was associated with 90% increased likelihood of having good safety practice [AOR=1.9, 95% CI=(0.69-5.02)].

Conclusions and Recommendations

Knowledge of occupational hazard was good but the safety practices were not encouraging. Government should ensure enforcement of laws and regular supervision to promote safety practices among the butchers.

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