# Study of Knowledge, Attitude and Practices Regarding Hygiene among Abattoir Workers in Kano State Metropolitan, Nigeria

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Absract: <u>Background</u>: The most important issue in all meat-processing plants is maintenance of proper hygiene and an abattoir has been defined as a premise approved and registered by the controlling authority for hygienic management of meat products for human consumption. <u>Objective</u>: To evaluate the level of knowledge, attitude and practice (KAP) regarding hygiene among abattoir workers. <u>Method</u>: A descriptive cross sectional design was conducted among 170 abattoir workers in Kano metropolitan area in Nigeria. Abattoir workers, chosen by stratified random sampling, were interviewed using a semi-structured questionnaire to assess their knowledge, attitude and practice of hygiene during the period of July to August 2014. <u>Result</u>: Descriptive statistics and multivariate analysis were used to analyze the level of KAP its association with other factors. Majority of the respondents (97%) received training regarding hygiene in abattoir and 75% of them stated that the training was done when the need arises. About 52% of the respondents exhibited the practice of washing their hand before starting the work. There is an association between knowledge, attitude and practice with regard to hygiene practice in abattoir (p<0.05). Factor analysis also showed that practice and attitude goes together, workers with higher age and working experience has a poor practice and knowledge but workers with lower age has a good attitude, better knowledge and good practice. <u>Conclusion</u>: There is increase in knowledge, attitude and practice of hygiene among abattoir workers, but there is need to increase the level of hygiene in the abattoir premises. It also shows that workers with good attitude have a better practice but such an association with knowledge is not necessary. However there is need to increase the level of knowledge on hygiene practices among abattoir workers in order to reduce the incidence of diseases and sickness in the state.

Keywords: Abattoir, Hygiene, Practice, Attitude, Knowledge.

### 1. Introduction

Food-borne diseases are recognized as a major human health problem and occurs commonly in both developed and under developed countries particularly in African countries, because of poor food handling and sanitation practices, inadequate food safety laws, weak regulatory systems, lack of financial resources to invest in safer equipment and lack of education for food-handlers. (1) Of the foods intended for human's consumption, those of animal origin tend to be most hazardous unless the principles of food hygiene are employed. Despite all these problems, there is very little information concerning the true level of exposure of specific populations to potential hazards, especially in the case of bacterial diseases that are transmitted by consumption of meat and meat products. (2) Bacterial contamination of meat products is an unavoidable consequence of meat processing. (3) Although there is very little data regarding hygiene practice among abattoir workers in the Nigeria, a few studies conducted in different parts of the world have shown the public health importance of several bacterial pathogens associated with foods of animal origin. (1,4-7)

The US Centers for Disease Control and Prevention revealed that in every year there is outbreaks of food borne diseases which resulted from foods of animal origin had caused approximately 76 million illness, 325,000 hospitalizations and 5000 deaths each year. (1) Hence, it is very important to have a clear understanding of the interaction on prevailing food safety, knowledge and practices of food handlers in order to reduce food borne outbreaks.(4) According to Gordon-Davis one of the major risks of food contamination originates from the working practices of food handlers and disease-causing micro-organisms present in or on the food handler's body are subsequently transported from the food handler to the food during the handling process. (8) Because meat is such a highly perishable food stuff and the abattoir, is such a labor-intensive working environment, the knowledge and level of training of the meat handlers regarding personal and general hygiene is of particular importance to ensure the health and safety of the consumer. (9)

Kano state located in North-western Nigeria and the most populated of the Nigerian federation, the current population of the state is more than 9,401,288million people. (10) There is an increased demand for foods of animal origin in the state. There is little published study conducted to explore the knowledge, attitude and practice of hygiene among abattoir workers in the world. Hence this study presents data on a survey that assesses the knowledge, attitude and practice of hygiene among abattoir workers in Kano metropolitan Nigeria.

## 2. Materials and Methods

#### **Study Area**

The study was conducted in Kano state metropolitan in June to July, 2014. There are 2,163,225 people as 2006 national population census living within the metropolitan which has a total area of  $499 \text{km}^2$ . (11) Kano state situated at  $11^0$  30'00 North latitude and  $8^0$  30 East longitude at an altitude of2300 meters above the sea level. (12)

Kano state is a predominantly Hausa Fulani state ethnic groups and it consists of wooded savanna in the south and scrub vegetation in the north and is drained by the Kano-Chalawa -Hadejia river system. Majority of the people in the state are farmers producing crops such as millet, rice, cassava, date palms, fruits, vegetables, sorghum, wheat, sweet potato, sugarcane, groundnut, cotton etc. Kano state rainfall usually ranges from three to five months with a temperature of  $26^{\circ}$ C to  $33^{\circ}$ C. (13)

### **Study Design**

This was a cross-sectional descriptive study mainly based on quantitative questionnaires to answer questions on knowledge, attitude and practice with regard to hygiene among abattoir workers. Knowledge, attitude and practice were determined by the use of structured interview and through direct observations of the hygienic status and practices by abattoir workers. The target population constituted all the people working in abattoir. The abattoir involved were three metropolitan abattoirs, namely Kano main abattoir, Bachirawa abattoir and Yarakwa abattoir. Individual verbal consent was obtained from the respondents prior to data collection and permission for data collection was taken from Ministry of Agriculture and natural resources through the Director Veterinary service Kano state. The study was approved by the Institutional Review Board of the School of Public Health, SRM University.

### **Data Collection**

A self administered questionnaire for this study was prepared which consists of four parts; the first part to collect information about the socio demographic characteristics of the respondents such as; age, marital status, years of working experience, and educational level, the second part consists of question covering the aspects of practices which include; hand washing, wearing of protective cloth, cleaning of protective cloth, method of pest control, methods of meat preservation and storage, the third part covered the aspect of knowledge that involves; training and frequency of the training and the last part consists of attitude of the respondents toward hygiene that include; agree hygiene is part of their responsibilities, frequency of training can improve hygiene, agree improper storage might be harmful to health and their response on wearing of protective cloth can reduces the risks of diseases. The questionnaire was designed in English. On an average 15minutes were spent to interview each respondent. Total sample size of 230 samples was calculated using n=  $z^2(pq)/d^2but$  only 170 data was collected and analyzed. Stratified random sample were used to select the respondents in which the workers are stratified based on the type of service they render in the abattoir ;Eviscerations, Flaying, Admin staff, Public health duty, Hide and skin, Bleeders and Sectioning. The number of samples drawn from each stratum were calculated and assigned using proportional allocation nh=n/N \*Nh where nh is the stratum sample size, n is the sample size, N is the total population and  $n_h$  is the stratum size.

## Statistical Analysis

Data were analyzed through Statistical Package for Social Sciences version 17.0.(14)Descriptive statistics such as means and frequencies were used to present the level of knowledge, attitude and practice of hygiene among workers, factor analysis were used to examine the association between knowledge, attitude, practices regarding hygiene, and correspondence analysis were used to examine whether the level of education of abattoir workers influenced the frequency of cleanliness of protective clothing.

# 3. Result

### 3.1 Demographic Characteristics of the Respondents.

Table 1 demonstrates the socio-demographic characteristics of respondents. Out of 170 respondents interviewed, majority of the workers (62%) were within the age group of 21-40, almost all the respondents (97%) received training regarding hygiene in abattoir by the public health personnel within the abattoir when the need arose. Majority of the respondents are married (67%). About 43% and 32% attended secondary school and primary school respectively, 17% completed tertiary education and only 7% with no formal education. Out of 170 respondents involved in this study 62% of the respondents had <10 years working experience, 10% have been in the sector for almost 15 years, 15% had more than 20 years of working experience.

 Table 1: Demographic characteristics of respondents

Characteristic	Demographic characteristics	Number (%) n=170	
Age	<20	9(5.3)	
	21-30	48(28.2)	
	31-40	58(34.2)	
	41-50	32(18.8)	
	>50	23(13.5)	
Marital status	Married	114(67)	
	Single	56(33)	
Educational level	Primary	55(32.4)	
	Secondary	71(41.8)	
	Tertiary	29(17.1)	
	No formal education	13(7.6)	
Working experience	<10	105(61.8)	
	11-15	18(10.6)	
	16-20	21(12.4)	
	>20	26(15.2)	
Service	Admin staff	18(10.6)	
	Bleeders	35(20.6)	
	Flaying	53(31.2)	
	Public health duty	15(8.8	
	Evisceration	31(18.2)	
	Splitting	7(4.1)	
	Hide and skin	11(6.5)	
Training	Yes	165(97.1)	
	No	5(2.9)	

### Practices regarding hand hygiene pest control, methods of meat preservation and storage of the workers in the abattoir.

Table2. Shows the practices performance regarding hand hygiene, 52% of the respondents washed their hands before starting the work, 47% washed their hand sometime before

the work. 96% of them washed their hand all the time after the work and 84% of the respondents wash their hands using water and detergent, 9% used only water and 7% used warm water and detergent. About 84% of the respondents used chemical as a method of pest control, 49% use cool room to store their meats, 39% store at room temperature and 91% of the workers are using refrigeration as a method of meat preservation.

 Table 2: Practices regarding hand hygiene pest control,

 methods of meat preservation and storage of the workers in

 the abattoir

Characteristics		Number
		(%)n=170
Hand washing before the	All the time	89(52.4)
work	Sometime	80(47.1)
	Not at all	1(0.6)
Hand washing after the	All the time	164(96.5)
work	Sometime	6(3.7)
	Detergent and water	144(84.7)
Method of hand washing	Warm water and detergent	11(6.5)
Pest control	Yes	167(98.2)
	No	3(1.8)
Method of pest control	Chemical method	143(84.1)
	Biological method	24(14.7)
	Don't know	2(1.2)
Method of meat storage	Room temperature	67(39.4)
	Cool room	84(49.4)
	Refrigerator	19(11.2)
Method of meat	Smoking	10(5.9)
preservation	Salting	5(2.9)
	Refrigeration	115(91.2)

# Practices regarding nature of protective clothing, cleaning of the cloth and method of cleaning of instrument by the workers in the abattoir.

In Table3 out of the 170 respondents, 79% of the workers are using overalls, 87% are using boot, 55% used glove and only 4% are using nose mask. About 71% of the workers wash their cloths on daily basis, 24% twice a week, 3% once a week and 2% washes their cloths irregularly. 64% of the respondents clean their instrument using water and detergent, 22% used warm water, and 9% used only water and 5% use hot water and detergent.

**Table 3:** Practices regarding nature of protective clothing, cleaning of the cloth and method of cleaning of instrument of the workers in the abattoir.

Characteristics		<i>Number (%) n=170</i>		
Nature of	Overall Yes	135(79.4)		
protective cloth	No	35(20.6		
	Boot Yes	145(88.9)		
	No	25(14.7)		
	Glove Yes	95(55.9)		
	No	75(44.1)		
	Nose mask Yes	8(4.7)		
	No	162(95.3)		
Cleaning of the	Daily	122(71.8)		
protective cloth	Twice a week	41(24.1)		
	Once a week	4(2.4)		
	Irregular	3(1.8)		
Method of	Only water	15(8.8)		
cleaning of	Water and detergent	110(64.7)		
instrument	Hot water	39(22.9)		

Hot	water	and 6(3.5)	
deterge	ent		

# Knowledge regarding training and frequency of training in the abattoir

Figure 1 demonstrates the level and frequency of training by the public health personnel in the abattoir,97% of the respondents received training regarding hygiene in abattoir by the public health personnel, in which 75% of the workers said the training is done when the need arise



Figure 1: Level and frequency of training

## Attitude of workers towards hygiene in abattoir

Figure2 shows the attitude of the workers toward hygiene practice in abattoir, majority of the respondents reported positive attitudes regarding hygiene in abattoir.98% stated that, hygiene was an important part of their job responsibilities, most of them 97% agree that, wearing of protective clothing can reduce the risk of diseases, 85% agree that frequent training by public health personnel can improve hygiene in abattoir and almost all the respondents agree that improper storage of meat might be harmful to health.



# Comparison of the knowledge, attitude and practice on hygiene

Table 4 describes the factor analysis which shows that, there is significant correlation between knowledge, attitude and practice (p<0.05), but practice and attitude goes together

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while knowledge goes separately, hence a worker with good attitude would have a better practice but knowledge is not necessarily correlated.

Table 4: Factor	analysis	of knowledge,	attitudes and
practices on	hygiene	among abattoi	r workers

Component p<0.05			
	Component		
	1	2	3
Mean score for practice	.754	283	592
Mean score for attitude	.742	358	.566
Mean score for knowledge	.601	.798	.044

# Association between level of education and frequency cleanliness of protective cloths

The correspondence analysis in the Figure 3 shows that , there is an association between the level of education and frequency cleanliness of protective cloth (p<0.05), the proportion of the respondents that completed the secondary school and tertiary institution goes with workers that washes their cloth on daily basis, however, workers that completed only the primary school are those that wash their cloth twice a week, hence as the level of education increased the frequency of cleanliness of protective cloth increase and the hygiene practice also increase.



# 4. Discussion

The aims of the study are to evaluate the level of knowledge, attitude and practice among abattoir workers and to examine relationship between knowledge, attitude and practice regarding hygiene in abattoir. Personal and general hygiene, training of the abattoir workers, method of pest control and methods of meat preservation and storage were included in this study. About 97% of the workers agree they received training when the need arises. But according to Soultos N et al regular training of meat handlers regarding the basic concepts and requirements of personal hygiene plays an integral part in ensuring safe products to the consumer. (15)

Majority of the respondents reported positive attitudes that, hygiene is part of their responsibilities (98%) this is also supported by a previous study in which the respondents (76.9%) stated that hygiene and safe food handling was an important parts of their job responsibilities. (16) Most of them (97%) agree that, the use of protective clothes can reduce the risk of diseases and cross contamination. Almost 85% agree with statement that frequent training can improve hygiene practices within the abattoir. All of them stated that improper storage of meat might be harmful. However, in the previous study, food handlers might be aware of the food safety attitudes they should have, but 63.0% of their respondents admitted that they seldom practice such positive attitudes. (17) This proved that although most of the abattoir workers in this survey gave positive answers but they might not practice it when handling meat.

In Kano state abattoir, there is no clear division of slaughtering process into stunning, slaughtering/bleeding, skinning, evisceration, chilling/hanging, cutting/deboning and frozen delivery as well as preventive mechanism installed for rodents and insects control. According to Roberts and de Jager, abattoir is one of the food industries that contribute to the problem of possible food-borne diseases and potential health hazards associated with food unless the principles of food hygiene are implemented. (18)this fact is also supported by this study finding where there is a gap in the training of the abattoir workers on handling of meat and maintaining hygienic status in their working area, because the training is normally done when there is a particular need.

Since the aims of wearing overalls are to protect both the food products and the meat handler from cross contamination, overalls should be suitable to wear over other clothing. (19) However, this study showed that 21% of the abattoir workers did not wear overall and 44% do not wear glove they all handled food with their bare hands and handling of foods with bare hands may also result in cross contamination, hence introduce microbes on safe food. Since meat handlers is one of probable sources of contamination for microorganisms, it is important to take all possible measures in order to reduce or eliminate such contamination. (20)

However, this study found that, 7% of the respondents wash their hands with warm water and soap. According to WHO the effective requirement of hand washing includes washing of hands in hot soapy water before preparing food and after using the bathroom, changing diapers and handling pets. (21)This study finding shows that 71% of the respondents wash their clothes every day after the work. Sneed et al showed that if food handlers take serious note on the cleanliness of their hand, body, and clothing, this will help in preventing incidence of cross-contamination from occurring. (22) Only 12% of the respondents used refrigerator as means of meat storage.

This study finding also revealed that, there is an association between level of education and frequency of the cleanliness of protective cloths (P<0.05). According to Askarian et al (2004) there is no difference between the staff who attended an educational course with those who did not. (24) This was supported by several studies and indicates that although training may increase the knowledge of food safety; this does not always produce a positive change in food handling attitudes.

# 5. Conclusion

The study revealed there is high level of knowledge, attitude and practice of hygiene among abattoir workers, but there is a need to increase the level of hygiene in the abattoir premises. It also shows that workers with good attitude have a better practice but knowledge is not necessarily associated, however there is need to increase the level of knowledge on hygiene practices among abattoir workers in order to reduce the incidences of diseases and sickness in state.

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