



Knowledge attitude and practices of bovine tuberculosis in abattoirs and slaughter slabs in the Federal Capital Territory, Abuja Nigeria

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Abstract

Bovine tuberculosis is a zoonotic and re-emerging disease occurring worldwide resulting in billions of dollars losses and death annually. The situation on economic and other losses are worse in developing countries like Nigeria. In a study to determine knowledge, attitude and practice on bovine tuberculosis, structural closed ended questionnaire was administered. Two hundred and eighty six (286) study participants were interviewed one on one and questionnaire administered. Descriptive and inferential statistics were used to analyze the data and variables (social demographic characteristic). Of the respondents 244(85.3%) were male and 42 (14.7%) were female. The knowledge, attitude and practice on bovine tuberculosis on interviewed indicated that 256 (89.5%) have knowledge of the disease while 201 (70.4%) strongly agreed that bovine tuberculosis pathogen constituted an occupational hazard and only 25 (8.7%) disagreed. 186 (65.0%) of the participants strongly agreed that personnel protective equipment was not conducive to work with as against who 46 (16.8%) agreed while 54 (18.8) were neutral. The study indicated a high knowledge, attitude and practice on bovine tuberculosis among the butchers and abattoir workers in the study areas. Bovine tuberculosis is a disease of public health concern and one health oriented approach should be instituted to mitigate control measures as well as more awareness on bovine tuberculosis in Nigeria.

Keywords: Knowledge attitude and practice, bovine tuberculosis, Federal Capital Territory

Introduction

Tuberculosis (TB) is a zoonotic re-emerging disease occurring worldwide and causing multi-billion-dollar economic losses and human death annually (Thoen *et al.*, 2009) [34]. Bovine tuberculosis (BTB), caused by *Mycobacterium tuberculosis* complex (MTBC), is a zoonotic disease that primarily affects cattle, but also other domestic and wild mammals. Moreover *Mycobacterium bovis* is the bacilli within the MTBC mostly detected in tuberculous lesions from cattle (Krajewska *et al.*, 2017; Waters *et al.*, 2017; Yahyaoui-Azmi *et al.*, 2017; Ku *et al.*, 2018) [19, 20, 37, 38]. It is the cause of zoonotic tuberculosis in humans that can spread from infected animals to humans (Cosivi *et al.*, 1998; Ashford *et al.*, 2001; Pal, 2007; Pal *et al.*, 2014) [7, 12, 29, 30]. Economic losses due to bovine tuberculosis are mainly as a result of reduced productivity of infected animals and the condemnation (partial or total) of the carcasses at slaughter (Olea-Popelka *et al.*, 2017) [28]. In developing countries, eradication of bovine tuberculosis is hindered by lack of funding, proper logistics and inadequate adherence to basic procedures such as antemortem and post-mortem inspections (Kwaghe *et al.*, 2015). The disease constitute a treat in many countries including Nigeria (Ayele *et al.*, 2004) [9]. Bovine tuberculosis remains a major threat to cattle, other domesticated animals and certain populations of wildlife (Ayele *et al.*, 2004; Doyle *et al.*, 2014) [9, 16]. Bovine tuberculosis has been reported in almost all the states of Nigeria (Cadmus *et al.*, 2006; Nwanta *et al.*, 2011; Abubakar *et al.*, 2012; Ahmad, 2015; Saidu *et al.*, 2017; Danbirni, 2016) [1, 2, 11, 15, 25, 33]. Not only that Nigeria has also been ranked third to fifth among the high tuberculosis burden countries in the world along other countries like India, Indonesia, and China, and ahead of Pakistan and South Africa (WHO, 2017; Alan *et al.*, 2016) [5, 35]. Bovine tuberculosis is transmitted through the consumption of unpasteurized milk from infected cow. Thus, the occurrence of bovine tuberculosis in humans is extra-pulmonary (Shitaye *et al* 2006) [32]. Bovine tuberculosis is principally a respiratory infection, and a large proportion of the infection

is thought to occur through direct transmission of aerosols between animals kept in close proximity (Collins 2006) [13]. Exposure to aerosols containing *M. bovis* is considered the most frequent route of infection among cattle, but infection by ingestion of contaminated materials has also been reported (OIE 2009) [27].

In countries where bovine tuberculosis is endemic, uncontrolled or partially controlled, aerosol is the key route of transmission for the humans along with ingestion of contaminated water, meat and milk (Awah-Ndukum *et al.*, 2016) [8]. Workers handling carcasses of infected animals get infection through skin and mucous membranes (de la Rua-Domenech, 2006; Michel *et al.*, 2010) [14, 24]. Bovine tuberculosis outbreaks trigger large economic losses, agricultural livestock economies by curtailing international trade of animals and animal products, causing reduction in milk and meat production, compromising fertility, massive control and eradication strategies, and increased public health risks (Dejene *et al.*, 2016). Endemicity of bovine tuberculosis among animals has been attempted to be controlled using test and slaughter strategy. For past decades, infected or carrier subjects are identified using the comparative cervical intradermal tuberculin test (CCIT), also termed as the tuberculin skin test (TST) (Monaghan *et al.*, 1994) [23]. Extensive efforts has been made around the globe to eradicate bovine tuberculosis because of its zoonotic and economic consequences. In developing countries, precise data on prevalence of infection is needed to improved surveillance programs and control of bovine tuberculosis (Moiane *et al.*, 2014) [21]. The aim of this study was to incorporate the knowledge, attitude and practice of abattoir workers and butchers needed for effective control measures.

Materials and Methods

Study location

This study was conducted in the Federal Capital Territory (FCT), Abuja which was created in 1976 and has an estimated human population of 1,495,201 according to

(NPC, 2006). It lies between latitude 8.25 and 9.20 north of the equator, and longitude 6.45 and 7.39 east of Greenwich Meridian. The Federal Capital Territory has a land mass of approximately 7,315km² of which the actual city occupies 275.3km². It is situated within the savannah region with moderate climatic conditions.

Study design

A cross-sectional study was conducted at the Gwagwalada, Abaji and Kwali Area Councils Abattoirs and Slaughter houses, between September 25th and October 7th 2021.

Questionnaire Administration

A total of 286 questionnaires were administered to butchers and abattoir workers in Gwagwalada, Abaji and Kwali abattoirs and slaughter houses were interviewed by means of a structured closed ended questionnaire to ascertain the Knowledge, Attitude and Practices of butchers and abattoir workers towards bovine tuberculosis in the abattoir, and all the study participants responded appropriately giving a response rate of 100%. The questionnaire was pre-tested for validity and clarity prior to administration to respondents. The questions were put in simple, concise and specific manner to prevent ambiguity.

The questionnaire was divided into sections and contained inter- alia; Demographic Information (Age, Gender, Level of Education, Religion, Work Designation (Butcher, Meat Vendor and Meat Inspector), Marital Status, Residence (Rural and Urban); Knowledge of the disease, Risk Factors, Perceived Susceptibility, Perceived barriers to prevent the disease and Cues to action.

Data Analysis

Statistical Packages for Social Sciences (SPSS Version 23.0) was used to analyze data obtained and results presented in the form of charts and tables. Chi – square was used to test for association between outcome of Knowledge, Attitude and Practices level and 95% confidence interval

was used where appropriate to test for association. P-value ≤ 0.05 was considered as significant.

Results

The characteristic of participants captured under demographic information are shown on Table 1. Of the 286 respondents 244 (85.3%) were males and 42 (14.7%) were females.

Table 2 shows the work experience of abattoir workers. It was observed that those within the age group of 21-30 years were 152 (53.1%) compared with those between the age of 31-40 years 39 (13.6%).

Of the total respondents, 256 (89.5%) of the abattoir workers have the knowledge of Bovine tuberculosis, while 246 (86%) have the knowledge of the public health implications of contaminated meat in the spread of bovine tuberculosis. There were variable responses to the questions. Also 201% of the abattoir workers respondents, strongly agreed that their occupation can predispose them to bovine tuberculosis, while 121% were of the view that eating raw meat can cause bovine tuberculosis (Table 3). It was further observed that 215% respondents strongly agreed that free supply of personnel protective equipment’s will help prevent the spread of bovine tuberculosis (Table: 4). Table: 5 shows 186 (68.0%) of abattoir workers perception on the prevention of bovine tuberculosis.

Figure 1: shows the sex distribution of butchers and abattoir workers in Gwagwalada, Abaji and Kwali abattoirs and slaughterhouses in Abuja, FCT.

Figure 2: shows the age distribution of butchers and abattoir workers in Gwagwalada, Abaji and Kwali abattoirs and slaughterhouses in Abuja FCT.

Figure 3: shows the perception of butchers and abattoir workers on educational programs, supply of clothing, adequate compensation, television advertisement and radio advertisement in three area councils in FCT, Abuja.

No significant difference (P≥ 0.5) and no statistical association between bovine tuberculosis, abattoirs and slaughterhouses.

Table 1: Demographic Information on Butchers and Abattoir Workers in three area councils in FCT, Abuja

Characteristics n=286	Frequency (n)	Percentage
Gender		
▪ Male	244	85.3
▪ Female	42	14.7
Educational Status		
▪ Primary	167	58.3
▪ Secondary	52	18.2
▪ Higher Education	26	9
▪ None	41	14.5
Age		
▪ 15-20	32	11.2
▪ 21-30	152	53.1
▪ 31-40	63	22.1
▪ >40	39	13.6
Work Designation		
▪ Butcher	195	68.2
▪ Meat Vendor	85	29.7
▪ Meat Inspector	6	2.1
▪ Meat Inspector	00	00
Work Experience		
▪ <5	43	15
▪ 5-10	157	54.9
▪ >10	86	30.1
Marital Status		
▪ Single	100	65
▪ Married	186	35
Residence		
▪ Rural	256	89.5
▪ Urban	30	10.5

Table 2: Knowledge, Attitude and Risk Factors associated with Bovine Tuberculosis of Abattoir Workers in three area councils in FCT, Abuja

Knowledge	Frequency (n)		Percentage (%)	
	Yes	No	Yes	No
Have you heard of Bovine Tuberculosis	256	30	89.5	10.5
Can bovine tuberculosis spread from animals to humans	174	112	60.8	39.2s
Do you consider Raw Milk and Meat as a source of bovine tuberculosis	230	56	80.4	19.6
Can a healthy looking meat contain bovine tuberculosis pathogen	235	51	82.2	17.8
Does consumption of contaminated meat serve as a source of TB in humans	246	40	86	14
Have you seen bovine tuberculosis lesion in a slaughtered animal	223	63	78	22
Do you consume meat with the lesions	10	276	3.5	96.5
Do you call the attention of the meat inspector whenever you see the lesion	185	101	64.7	35.3

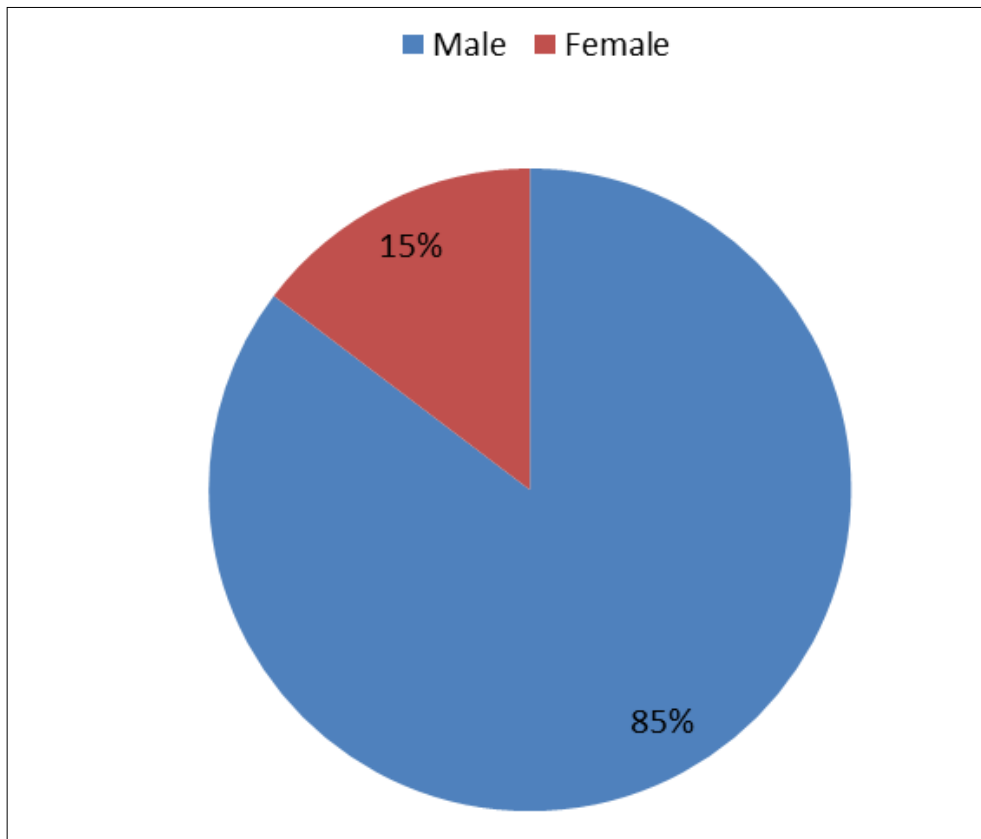


Fig 1: Sex distribution of butchers in Gwagwalada, Abaji and Kwali abattoirs and slaughterhouses in Abuja, FCT

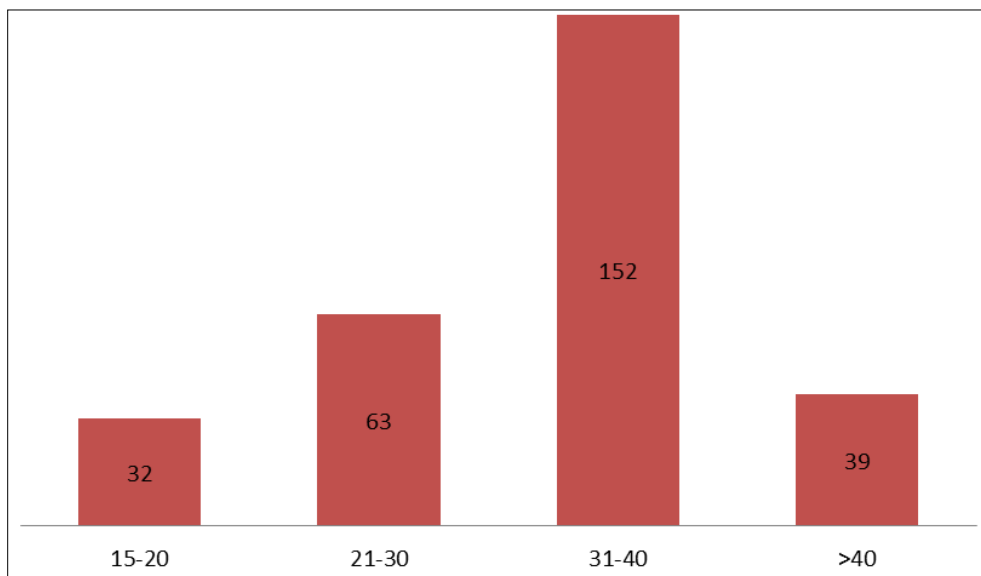


Fig 2: Age distribution of butchers in Gwagwalada, Abaji and Kwali abattoirs and slaughterhouses in Abuja FCT

Table 3: Perception of the increased risks of abattoir workers to BT in three area councils of the FCT, Abuja

Questions	Disagree	Strongly Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Q1. Do you think that you have an increased chance of contracting bovine tuberculosis because of your work?					
Freq/percent	25 (8.7)	0	15 (5.2)	45 (15.7)	201 (70.4)
Q2. Do you think that you are at increased risk of contracting bovine tuberculosis when you eat raw meat?					
Freq/percent	35 (12.2)	23 (8.0)	50 (17.5)	57 (20)	121 (42.3)

Table 4: Analysis on perceptions of abattoir workers in three area councils in FCT, Abuja on the control of bovine tuberculosis

Questions	Disagree	Strongly Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. Do you think that educational programs would help to protect bovine tuberculosis?					
Freq/percent	0 (0)	0 (0)	32 (11.2)	59 (20.6)	195 (68.2)
2. Do you think that supply of free clothing would help to protect bovine tuberculosis?					
Freq/percent	0 (0)	0 (0)	0 (0)	71 (24.8)	215 (75.2)
3. Do you think that adequate compensation for cooperating with test and slaughter campaigns would help to protect bovine tuberculosis?					
Freq/percent	0 (0)	0 (0)	0 (0)	90 (31.5)	196 (68.5)
4. Do you think that television advertisement would help to protect bovine tuberculosis?					
Freq/percent	0 (0)	0 (0)	0 (0)	90 (31.5)	196 (68.5)
5. Do you think that radio advertisement would help to protect bovine tuberculosis?					
Freq/percent	0 (0)	0 (0)	0 (0)	81 (28.3)	205 (71.7)

Table 5: Responses on the perception against the prevention of bovine tuberculosis by abattoir workers in three area councils of FCT, Abuja

Questions	Disagree	Strongly Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Q1. Cannot wear protective clothing because they are not conducive to work?					
Freq/percent	0 (0)	0	54 (18.8)	46 (16.2)	186 (65.0)
Q2. Cannot wear protective clothing because they are expensive?					
Freq/percent	0 (0)	0 (0)	63 (22)	32 (11.2)	191 (66.8)
Q3. Do not wear protective clothing because my colleagues do not?					
Freq/percent	45 (15.7)	14 (4.9)	74 (25.9)	153 (53.5)	0 (0)

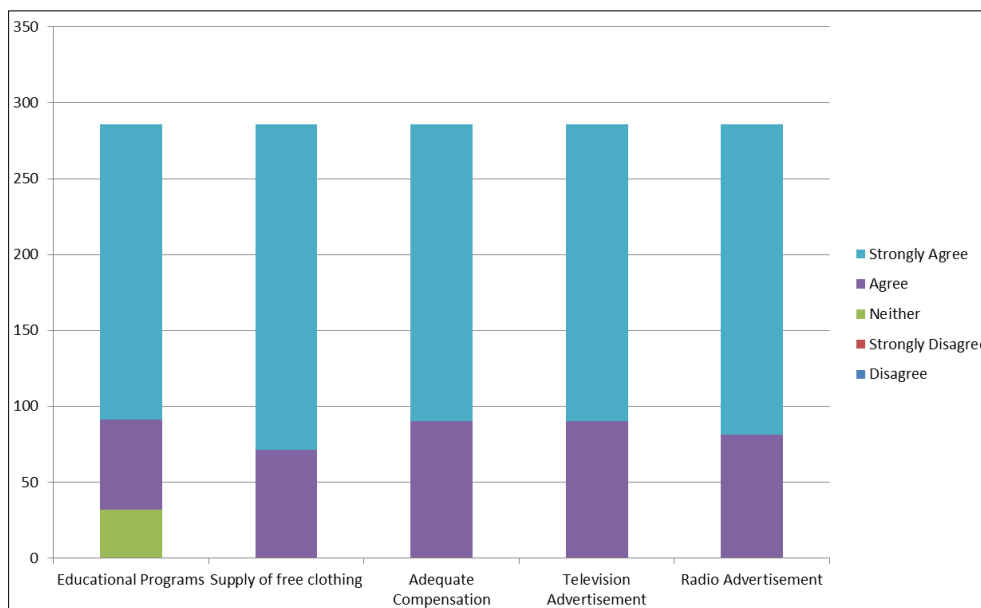


Fig 3: Analysis on perception of abattoir workers in three area councils in FCT, Abuja on the control of BT

Discussion

Bovine Tuberculosis is a disease of public health importance. This present study revealed that 89.5% of the respondents had a good knowledge of bovine tuberculosis which is higher than 40.3% reported by Mario *et al.*, (2016) from two Abuja abattoirs, FCT, Nigeria. Likewise, Romha *et al.*, (2014) [21] and Amare *et al.*, (2019) [3] reported lower awareness of 29.1% and 24.7% respectively from studies conducted on bovine tuberculosis in Ethiopia. The differences on the knowledge among respondents could be attributed to the educational level and awareness on the disease, location and number of respondents. 60.8% of the

study participants agrees that bovine tuberculosis can be transmitted from animals to humans which is in conformity with the reports of Sa’idu *et al.*, (2015) from Bauchi state in Nigeria, Bati *et al.*, 2013; Romha *et al.*, 2014; Amare *et al.*, (2019) [3, 10, 31] all from Ethiopia. In this study 70.4% of the respondents believed in occupational exposure as a factor in the spread of bovine tuberculosis which is agreement with the reports of (Mairo *et al.*, 2016; Sa’idu *et al.*, 2015). The knowledge of respondents on the implication of bovine tuberculosis to humans as occupational risk could be due to work experience, age and level of education among the participants. Furthermore, 80.4% of the respondents agrees

that consumption of raw contaminated milk and meat serves as a predisposing factor for bovine tuberculosis which agrees with the findings of (Ameni *et al.*, 2007; Bati *et al.*, 2013; Romha *et al.*, 2014 ; Amare *et al.*, 2019) [3, 4, 10, 31]. Respondents from this study agrees that educational programs, supply of free protective clothing, adequate compensation, television advertisements and radio advertisements can help in the control of bovine tuberculosis.

Conclusion

The conclusion from this research provided evidence on the awareness of bovine tuberculosis in three abattoir and slaughter houses in FCT, Abuja. Which shows that participants have knowledge of bovine tuberculosis. However there is need for continuous monitoring and surveillance of this disease in the field and amongst abattoir workers so as to reduce the prevalence and risks of abattoir workers to the barest minimum as well community health education will aid in the control and prevention of bovine tuberculosis.

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