

Full length research paper

Knowledge and practice of food safety and hygiene among food vendors in primary schools in Jos, Plateau State, North Central Nigeria.

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Food is an important basic necessity which is essential for health and wellbeing of humans. Therefore, ensuring safe food handling and preparation is of paramount importance. A descriptive cross sectional study carried out among food vendors in primary schools in Jos North Local Government Area to determine the knowledge and practice of food safety and hygiene. EPI info statistical software version 3.5.4 was used for data analysis and 95% confidence interval was used in this study with a $P \leq 0.05$ considered statistically significant. The mean age of the food handlers in the study was 25.8 ± 5.3 years with the mean years of work experience as 7.8 ± 1.3 years. One hundred and six (60.9%) of the respondent had good knowledge with a mean knowledge score of 18.59 ± 5.90 . Statistical significant relationship was found between age ($P < 0.001$) and practice of food safety and hygiene. The level of knowledge and practice of food safety and hygiene in this study needs improvement through structured food safety and hygiene training.

Key words: Knowledge, Practice, Food safety and hygiene, food vendors

INTRODUCTION

Food borne diseases remain a major public health problem globally (Zeru et al., 2007; FSANZ, 2001; WHO, 2004). In developing countries, up to an estimated 70% of cases of diarrheal disease are associated with consumption of unwholesome food (Zeru et al., 2007; Mukhopadhyay et al, 2012; Annor et al., 2011). Food contamination can occur at any point during its preparation, bringing to bear the importance of food safety and hygiene in the prevention of food borne diseases (Green et al., 2005; Mudey et al., 2010; Ismail et al., 2013). This study was carried out to assess the

knowledge and practice of food safety and hygiene among food vendors in Primary Schools in Jos North Local Government Area (LGA) of Plateau State.

METHODS

Study Area

The study was conducted in Jos North LGA of Plateau State. Plateau State is bounded by Bauchi State to the Northeast, Kaduna State to the Northwest, Nasarawa State to the Southwest and Taraba State to the Southeast (Plateau State, 2013). It has a population of 3,206,531 people with a land area of 30,913 km² (Plateau State, 2013; National Bureau of Statistics, 2006). It is located between longitude 80°32' and 100°38' East. Plateau state is bounded in the North East by Bauchi

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State, North West by Kaduna State, South West by Nasarawa State and South East by Taraba State (Plateau State, 2013). Jos North LGA has an area of 291 km² with a population of 429,300 with a total of 45 registered primary schools (National Bureau of Statistics, 2006; Plateau State Government, 2013).

Study Population

The study population comprised of food vendors in selected primary schools

Study Design

The study was a descriptive cross-sectional study using quantitative method of data collection.

Inclusion and Exclusion Criteria

All food vendors 18 years and above involved in food provision for the pupils for a fee authorized by the school authority within the school premises at the time of the study were included while all food vendors below 18 years of age without any authorization of the school authority and providing food outside the school premises were excluded.

Sample Size Determination

The sample size was calculated using standard acceptable formula and 13% proportions of food vendors with good knowledge of food safety from a previous similar study was used (Mukhopadhyay et al., 2012). A minimum sample size of 174 was used for the study.

Sampling Technique

A multi-stage sampling technique was used in this study.

Stage I

A list of all the 45 registered primary schools in Jos North Local Government was obtained and then stratified into 19 private and 26 public primary schools.

Stage II

From the stratified list, 24 primary schools will be selected (12 private and 12 public primary schools) by

balloting using simple random technique.

Stage III

All the food vendors in all the selected primary schools who had met the inclusion criteria were sampled.

Preparation for Data Collection

Advocacy visits were paid to the head masters/proprietors of all the 24 selected primary schools intimating them with the research and soliciting for their support. Four resident doctors from the Department of Community Medicine were trained as research assistants to aid with the administration of questionnaires. The tool of data collection was pretested in a public primary school in Jos South LGA within the State.

Data Collection Instrument

A semi – structured interviewer administered questionnaire was used to obtain information from the participants

Data Collection

Four trained research assistants participated in the data collection in the study after a detailed explanation as to the purpose of the study was given to all the eligible respondents. Verbal informed consent was sought and obtained from each of the participants with. Anonymity and confidentiality of the information obtained was assured and maintained.

Data Analysis

Data analysis was done using Epi infoTM statistical software package version 3.5.4. Chi square statistical test was used to determine relationship between characteristics of the food vendors and the practice of food safety and hygiene. A 95% confidence level was used and $P \leq 0.05$ was considered statistically significant.

Scoring and Grading of Responses

Knowledge of food safety and hygiene

There were 15 stem questions on knowledge of food safety and hygiene with 64 responses. Only 34 of these responses were correct. One mark was awarded for each correct response and no mark was awarded for wrong

Table 1. Socio – demographic characteristics of the food vendors

Characteristics	Frequency	Percentage	n = 174
Age group (years)			
18 - 26	51		29.3
27 – 36	90		51.7
37 – 46	32		18.4
47 – 56	1		0.6
	Mean ± Standard deviation		
Mean age	25.8 ± 5.3 years		
Sex			
Female	119		68.4
Male	55		31.6
Marital status			
Single	43		24.7
Married	117		67.2
Separated	1		0.6
Widowed	13		7.5
Level of education			
None	2		1.1
Primary	50		28.7
Secondary	96		55.2
Tertiary	26		14.9
Religion			
Christianity	119		68.4
Islam	55		31.6
Years of working experience			
≤ 5 years	81		46.6
>5 years	93		53.4
	Mean ± Standard deviation		
	7.8 ± 1.3 years		
Mean year of working			
Food safety training			
Attended	20		11.5
Not attended	154		88.5

response or I don't know response and a total of 34 maximum attainable scores were used for knowledge of food safety and hygiene. A score of 0–17 marks out of 34 marks was graded to be poor knowledge and a score of 18–34 marks out of 34 marks was graded as good knowledge.

Practice of food safety and hygiene

There were 16 questions on the practice of food safety and hygiene. A four - point rating scale was used for the responses (4 points for always, 3 points for most times, 2 points for sometimes and 1 point for never) A total of 64 maximum attainable points was used for practice of food safety. A score of 0–32 marks out of 64 marks was graded as poor practice while a score of 33–64 marks out of 64 marks was graded as good practice.

RESULT

One hundred and seventy four (174) food vendors participated in this study. The age range of the respondent was 18 – 56 years with more than half (51.7%) within the age group 27 – 36 years and the mean age of 25.8 ± 5.3 years. One hundred and nineteen (68%) of the food vendors were females and 117 (67.2%) of them married while 43 (24.7%) were single. Slightly above half (55.2%) of the respondent had completed secondary education and 26 (14.9%) had tertiary education. The respondents who had been working as food vendor for more than 5 years were 93 (53.4%) and only 20 (11.5%) of all the respondents had attended at least one food safety training before the study. [Table 1].The assessment of knowledge of food safety and hygiene revealed that 96 (55.2%) of the food vendors could correctly defined food borne disease and 145 (83.3%), 132 (75.9%) and 20 (11.5%) of the food vendors mentioned diarrhoea, cholera and Hepatitis A types of food borne disease respectively. The proportion of the food vendors in this study with good knowledge of food safety and hygiene was 106 (60.9%) while 68 (31.9%) had poor knowledge with the mean knowledge score of 18.59 ± 5.90 out of a total of 34. [Table 2].This study revealed that only 37 (21.3%) of the respondents practiced hand washing with soap and water before and after preparing food always. Concerning cleaning and sanitizing cutting surfaces before and after use, very few (15.5%) of the food vendors practiced cleaning and sanitizing of cutting surfaces as expected. Fifty five (31.6%) of the food vendors stated that they always reheat leftover food before serving it. Ninety-eight (56.3%) of the respondents were found to have good of practice of food safety and hygiene. [Table 3] Age of the respondents showed statistically significant relationship with practice of food safety and hygiene (P < 0.001). Similarly level of education of the food vendors, knowledge of food safety and attendance of food safety and hygiene training had statistical significant influence on the practice of food safety and hygiene. [Table 4]

Table 2: Knowledge of food safety and hygiene among the food vendors

Parameters	Frequency	Percentage n =174
Definition of food borne disease		
Correct	96	55.2
Incorrect	78	44.8
Type of Food borne disease*		
Diarrhoea	145	83.3
Cholera	132	75.9
Hepatitis A	20	11.5
Typhoid	95	54.6
Don't Know	11	6.3
Level of knowledge		
Good	106	60.9
Poor	68	31.9
	Mean \pm standard deviation	
Mean Knowledge score	18.59 \pm 5.90	

*= Multiple responses obtained

Table 3: Practice of food safety and hygiene among the food vendors

Parameters	Frequency	Percentage n = 174
Hand washing with soap and water before and after preparing food		
Always		
Most of the time	37	21.3
Sometimes	35	20.1
Never	39	22.4
	63	36.2
Cleaning and sanitizing cutting surfaces before and after use		
Always	27	15.5
Most of the time	44	25.3
Sometimes	78	44.8
Never	25	14.4
Reheating of leftover food before serving		
Always		
Most of the time	55	31.6
Sometimes	36	20.7
Never	23	13.2
	60	34.5
Level of Practice		
Good	98	56.3
Poor	76	43.7
	Mean \pm standard deviation	
Mean practice score	36.52 \pm 11.59	

Table 4: Relationship between characteristic of food vendors and the practice of food safety and hygiene

Characteristics	Level of practice		Total	χ^2	df	P-value
	Good Freq (%)	Poor Freq (%)				
Age group (years)						
18 - 26	28 (54.9)	23 (45.1)	51			
27 – 36	52 (57.8)	15 (46.9)	67			
37 - 46	17 (30.9)	38 (69.1)	55	28.937*	3	<0.001
47 – 56	1 (100.0)	0 (0.0)	1			
Total	98	76	174			
Sex						
Female	64 (53.8)	58 (46.2)	119	0.988	1	0.320
Male	34 (61.8)	21 (38.2)	55			
Total	98	76	174			
Level of education						
None	1 (50.0)	1 (50.0)	2			
Primary	10 (20.0)	40 (80.0)	50	42.511*	3	<0.001
Secondary	65 (67.7)	31 (32.3)	96			
Tertiary	22 (84.6)	4 (15.4)	26			
Total	98	76	174			
Years of working experience						
≤ 5 years						
> 5 years	48 (59.3)	33 (40.7)	81			
Total	50 (53.8)	43 (46.2)	93	0.532	1	0.466
	98	76	174			
Food safety and hygiene training						
Attended	17 (85.0)	3 (15.0)	20	7.555	1	0.006
Not attended	81 (52.6)	73 (47.4)	154			
Total	98	76	174			
Knowledge of food safety						
Good						
Poor	67 (63.2)	39 (36.8)	106	5.228	1	0.022
Total	31 (45.6)	37 (54.4)	68			
	98	76	178			

* = Likelihood ratio chi square

DISCUSSION

Food vendors in this study had an average age of 25.8 ± 5.3 years with age range of 18 – 56 years. This was similar to findings of studies conducted among food handlers in Nigeria, Slovenia and Malaysia (Chukuezi,

2010; Jevsnik et al., 2008; Zain et al., 2002; Nee et al., 2011). This similarity indicated that majority of the food handlers were middle aged people. In this study there were more female food vendors than males which is similar to findings of other studies in Nigerian (Chukuezi, 2010; Musa et al., 2003; Smith et al., 2010). More

(68.4%) of the food vendors were Christians in this study which is consistent with what was obtained from a Ghanaian study (Donkor, 2009). More of the respondents were married which is similar to the findings of studies conducted among food handlers in Malaysia and India (Zain et al., 2002; Abdalla et al., 2008).

The highest educational level of 55.2% of the respondents in this study was secondary which in synergy with the finding of another Nigerian study conducted in Owerri revealing that more than half of the respondents (52.38%) had secondary education and contrary to the findings of studies done in Turkey and Bangkok (Chukuezi, 2010; Murat et al., 2006; Cuprasittrut et al., 2011). However, a Nigerian study carried out in Ilorin revealed that more than half of the respondent had no formal education whereas in this study, only 1.1% of the food vendors did not have formal education (Musa et al., 2002). More of the respondents in this study had been working as food vendors for more than 5 years which is at variance from findings from studies conducted in Malaysia and India reporting that most of the food handlers had been working for a period of less than 5 years (Zain et al., 2002; Abdalla et al., 2008). The average year of working as food vendor by the respondents in this study was 7.8 ± 1.3 years contrary to the findings of an American study (Mehmet et al., 2009). A study from Slovenia reported average years of working of the respondents at 17.3 ± 9.9 years (Jevsnik et al., 2008). While another from Thailand also put the mean years of experience in career as food handlers at 5.7 ± 4.7 years (Cuprasittrut et al., 2011). Majority (88.5%) of respondents in this study had not attended any food safety and hygiene training prior to this study which is similar to 62.5%, 79.3% and 78.2% of the respondents in Malaysian, Thailand and Ethiopian studies who had not attended any food safety training (Zain et al., 2002; Cuprasittrut et al., 2011; Kibret et al., 2012).

In this study, more than half of the food vendors had good knowledge of food safety and hygiene with a mean knowledge scores of 18.59 ± 5.90 out of 34 points. Another study corroborated this finding classifying the respondents as having moderate knowledge of food safety and hygiene with mean score of 57.8% (Nee et al., 2011). Contrary findings were obtained in studies conducted in Malaysia and Iran (Zain et al., 2002; Pirsahab et al., 2010). Another study conducted in Korea found poor knowledge of food safety with mean score of 49.3 out of 100 points (Park et al., 2010). Also in a Thailand study only 13.0% of the respondents had good knowledge of food safety (Cuprasittrut et al., 2011). Majority of the food vendors in this study knew at least one type of food borne disease which is similar to responses obtained in a study conducted in Ethiopia (Zeru et al., 2007). Slightly above half of the food vendors could correctly define food borne disease which was

lower than the proportion of respondents who correctly defined food borne disease in Malaysian study (Nee et al., 2011). Above half (56.3%) of the respondents reported good practice of food safety and hygiene with a mean practice score of 36.52 ± 11.59 out of 64 points. Findings from a Malaysian study also reported that more than half (54.7%) of the food handlers had safe food handling practices (Zain et al., 2002). Contrary to this, a Thailand study found a lower proportion (15.2%) of food handlers with good practice of food safety (Cuprasittrut et al., 2011). The practice of proper hand washing was poor in this study as only few respondents consented to always practicing hand washing with soap and water, whereas in another study conducted elsewhere 60% of the respondents practiced proper hand washing with soap and water (Nee et al., 2011). The practice of cleaning and sanitizing cutting surfaces in this study was poor as only 15.5% of the food vendors always practiced it whereas in a study conducted in Trinidad, 45% of the food handlers cleaned and sanitized their cutting boards (Patron, 2006). Knowledge of food safety and hygiene was found to have statistically significant relationship with practice of food safety and hygiene in this study which in agreement with a Thailand study (Cuprasittrut et al., 2011).

CONCLUSION

The level of knowledge and practice of food safety and hygiene in this study need improvement through structured food safety and hygiene training to ensure the delivery of wholesome food to the consumers.

No conflict of interest declared

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