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Knowledge, perception and practice of food hygiene among residents of Edu Local Government Area, Kwara State, Nigeria

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Abstract

Introduction: Many inappropriate hygiene practices such as poor personal and environmental hygiene, inadequate storage of food, improper preparation and cooking are known to compromise the safety of food. This Study assessed the knowledge, perceptions and practices of food hygiene among residents in Edu Local Government Area of Kwara state.

Methods: This was descriptive cross-sectional study design that employed a multistage sampling technique. The data was analyzed using SPSS (version 21). The level of significance was set at a p-value of <0.05 and 95% confidence interval.

Results: The mean and standard deviation of age of the study participants were 37.6 ± 12.5 years. The findings revealed an adequate knowledge (94.9%) and perception (99.0%) on food hygiene, but the practice was very poor; as only about three-quarter (31.2%) had good practice of food hygiene. On bivariate analysis, only sex ($p=0.013$) and tribe were significantly associated with good practice of food hygiene.

Conclusion and Recommendations: Implementing health education and awareness campaigns that target behaviour change with focus on food handling, storage, and preparation is crucial for improving residents' practices and encouraging better hygiene habits at home

Keywords: Knowledge; Perception; Practice; Food Hygiene

1. Introduction

Food is a fundamental human need, providing essential nutrients and energy for growth and development.¹ However, its nutrient-rich composition also makes it susceptible to contamination from various sources, including water, air, dust, equipment, sewage, insects, rodents, and food handlers.² Changes in food handling, preparation techniques, and eating habits can directly impact health, emphasizing the importance of maintaining food hygiene.³ Mishandling of food and poor hygiene practices in homes can facilitate the growth of pathogenic bacteria, leading to illness among consumers.⁶ Adherence to environmental and personal hygiene practices is vital in preventing foodborne diseases. Deliberate or accidental food contamination due to improper handling can pose significant health risks to consumers. Poor personal

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and environmental hygiene, inadequate food storage, and improper preparation and cooking are common hygiene practices that compromise food safety.⁷ The spread of fecal-oral pathogens in communities is often linked to poor personal hygiene and sanitation. In some communities, the practice of serving ready-to-eat food with bare hands further increases the risk of food contamination.⁸

Previous has indicated that knowledge, perception, and practice are crucial factors in ensuring food hygiene.¹⁰ Common food preparation practices associated with foodborne diseases include poor environmental hygiene, insufficient cooking, contaminated equipment, improper temperature control, and the use of unsafe food sources.¹¹ A study revealed that 27.7% of food handlers neglect hand washing before food preparation, and 28.1% use only water after toilet use¹⁸.

In recent years, there has been an increase in foodborne illness outbreaks, which are often linked to poor food hygiene practices. In Nigeria, more than 20,000 individuals perish annually, and more than 3 million acute food poisoning cases are reported yearly due to pesticide exposure from improper agricultural practices.¹⁰ The number of foodborne illnesses originating from domestic settings remains challenging, and it is widely acknowledged that the actual figure is likely significantly greater than reported statistics. Understanding how individual behaviors and activities influence food safety is crucial in mitigating the risk of foodborne illnesses, from handling to kitchen practices. Human activities play a pivotal role in food hygiene, with hands serving as a primary vehicle for bacterial transmission.

Given the limited research on food hygiene practices in Edu LGA, this study aims to fill this knowledge gap. As a significant market center for various agricultural products, Edu LGA residents rely on safe food practices to ensure consumer confidence and minimize the adverse effects of foodborne illnesses.

2. Material and methods

2.1. Study Area

This study was conducted in Edu Local Government Area of Kwara State, Nigeria

2.2. Study design

This was a cross-sectional descriptive study that used a quantitative method of data collection among eligible study participants using semi-structured interviewer-administered questionnaires

2.3. Study population

The respondents were residents of Edu LGA within the age of 18 years and above who satisfied the inclusion criteria for the study

2.4. Sample size determination and sampling techniques

$n = Z^2 Pq/d^2$ and adjusting for a 10% nonresponse rate.

The total sample size calculated was 400 using the formula for calculating the sample size for descriptive studies (Fischer's formula) in population $s > 10,000$.

A multistage sampling technique was used to select the study units that constituted the respondents for the study.

2.5. Data collection

This research was conducted in accordance with ethical standards, and the University of Ilorin Ethical Review Committee with approval number **UERC/ASN/2018/1164**. Confidentiality was maintained and informed consent was obtained. The research instruments used were questionnaires administered by the investigator and trained research assistants. Data was collected through questionnaires that assessed demographic information, knowledge of food hygiene, perceptions of food safety, and actual practices.

2.6. Data analysis

The data was analyzed via the Statistical Package for Social Sciences (SPSS) computer software package version 21, and data errors were checked for and corrected. The scores of knowledges, attitudes and practices were categorized as: poor/good knowledge, poor/good or negative/positive attitudes and poor/good practices on the basis of the summation of individual scores of the variables. Thus, for interpretation of the results, knowledge, attitudes and practice

were expressed as percentages of poor and good scores. The potential factors influencing KAP were examined via bivariate analysis. The results were presented via frequency tables and summary indices. The analysis included chi-square tests. Statistical significance was set at $p < 0.05$ at a confidence interval of 95%.

3. Results

A total of four hundred respondents were used for the study, 100% response rate. Table 1 shows that the mean age of the respondents was 37.6 ± 12.5 years, with sex distribution of females (55.3%) and males (44.8%). Nearly all the respondents (86.5%) were Nupe by tribes with Islam as the major religion practiced. More than three-quarter of the study participants were married (79.3%) with nearly about three-quarter (62.5%) having a monogamous type of marriage. While more than half (53.8%) had tertiary education. Table 2 showed that nearly all of the respondents (90.2%) had a good level of knowledge about food hygiene whereas the remaining respondents (9.8%) had poor knowledge about food hygiene. Table 3 showed that almost all the respondents (99%) had good perceptions on food hygiene. Table 4 showed that the majority of the respondents had poor practice on food hygiene. Only about one-third (31.2%) had good practice of food hygiene, while more than more than two-third (68.8%) had poor practice of food hygiene. On bivariate analysis between socio-demographic characteristics and practice of food hygiene, only sex ($p=0.013$) and tribe ($p<0.05$) were associated with good practice of food hygiene.

Table 1 Sociodemographic Variables

Variables	Frequency (N=400)	Percentage (%)
Age		
≤20	21	5.3
21 - 30	126	31.5
31 - 40	117	29.3
41- -50	70	17.5
51 - 60	43	10.8
> 60	23	5.8
Mean ± SD	37.6±12.5	
Sex		
Male	179	44.8
Female	221	55.3
Tribe		
Nupe	346	86.5
Fulani	24	6.0
Yoruba	23	5.8
Others	7	1.8
Religion		
Islam	333	83.3
Christianity	67	16.8
Marital status		
Single	76	19.0
Married	317	79.3
Divorced	7	1.8
Level of education		

Primary	28	7.0
Secondary	71	17.8
Tertiary	215	53.8
None	86	21.5
Occupation		
Farming	178	44.5
Fishing	18	4.5
Civil Servants	81	20.2
Trading	50	12.5
Students	52	13
Unemployed	21	5.2
Type of marriage		
Monogamy	250	62.5
Polygamy	150	37.5
Type of family		
Nuclear	216	54.0
Extended	184	46.0

Table 2 Knowledge of Food Hygiene among the respondents

Variable	Frequency (N=400)	Percentage (100%)
Good	361	90.2
Poor	39	9.8
Total	400	100.00

Table 3 Level of Perception of Respondents towards Food Hygiene

Variables	Frequency (N=400)	Percentage (100%)
Good	396	99.0
Poor	4	1.0
Total	400	100.0

Table 4 Food Hygiene and Preservation Practices among Respondents

Variables	Frequency (N=400)	Percentage (100%)
Good	125	31.2
Poor	275	68.8
Total	400	100

Table 5 Bivariate analysis on association between sociodemographic variables and food hygiene practice

Variable	Food hygiene practice		χ^2	p-value
	Good	Poor		
Age			5.662	0.341
≤20	5 (4.5)	13 (4.7)		
21 – 30	43 (38.4)	79 (28.7)		
31 – 40	34 (30.4)	80 (29.1)		
41 – 50	15 (13.4)	55 (20.0)		
51 – 60	11 (9.8)	30 (10.9)		
≥61	4 (3.6)	18 (6.5)		
Sex			6.226	0.013*
Male	39 (34.8)	134 (48.7)		
Female	73 (65.2)	141 (51.3)		
Tribe			25.112	<0.05*
Nupe	98 (87.5)	261 (94.9)		
Yoruba	14 (12.5)	14 (5.1)		
Religion			1.144	0.285
Islam	89 (79.5)	231 (84.0)		
Christianity	23 (20.5)	44 (16.0)		
Marital status			4.805	0.090
Single	13 (11.6)	58 (21.1)		
Married	97 (86.6)	212 (77.1)		
Divorced	2 (1.8)	5 (1.8)		
Type of marriage			0.151	0.698
Monogamy	72 (64.3)	171 (62.2)		
Polygamy	40 (35.7)	104 (37.8)		
Family type			1.462	0.227
Nuclear	65 (58.0)	141 (51.3)		
Extended	47 (42.0)	134 (48.7)		
Level of education			1.822	0.610
Primary	9 (8.0)	19 (6.9)		
Secondary	16 (14.3)	51 (18.5)		
Tertiary	65 (58.0)	143 (52.0)		
None	22 (19.6)	62 (22.5)		
Occupation			1.166	0.558
Farming	56 (50.0)	121 (44.0)		
Fishing	5 (4.5)	13 (4.7)		
Others	51 (45.5)	141 (51.3)		

χ^2 : Chi square test, *: p value < 0.05 (statistically significant)

4. Discussion

The sex distribution of the study participants revealed more females (55.3%) than males (44.7); this findings was consistent with findings of other studies reported in Nigeria which revealed more participation of women than males in the survey.^{10, 16, 17, 20} In contrast studies reporting on the assessment of the food hygiene practices of food handlers in the Federal Capital Territory of Nigeria and knowledge, attitudes and practices concerning food hygiene practice among residents of Okene metropolis revealed more male than female participation in the study.^{12, 19}

Adequate knowledge of food hygiene among the respondents was also a common finding in previous similar studies conducted in India, Nigeria and Uganda ^{1, 17, 22} that revealed more than half of the respondents had good knowledge of food hygiene; higher levels of education were associated with better knowledge of food hygiene. Compared with a study conducted in Jos, Nigeria which revealed low levels of food hygiene knowledge among food vendors.²⁰ The positive perceptions of respondents towards food hygiene in the findings of this study were consistent with findings revealed in studies conducted in Ghana and Nigeria; there was almost a universal awareness of food hygiene among food vendors.^{13, 23} The distribution of respondents' practice score of food hygiene was (68.8%) which indicates a poor level of practices related to food hygiene. Contrary to the reports in this study; findings revealed in studies conducted in India and Ado Ekiti^{5, 16} that respondents had good practices of food hygiene and similar to findings revealed in studies conducted in Ghana, Plateau and Ethiopia,^{17, 20, 24, 25} that respondents' practices of food hygiene were low.

However, certain factors influencing food handling practices, such factors not removing contaminants from water before usage, wearing of nail polish/growing of finger nails during handling, preparing and cooking food, insufficient reheating of leftover food, improper cleaning of cooking utensils, improper checking of refrigerant temperatures periodically to reduce the risk of food contamination and poor waste management systems have been revealed. Similar to a study conducted in Ado Ekiti, respondents' methods of waste disposal and sources of drinking water pose a future threat to the health of community residents.¹⁵

For most of the respondents, there was a lack of correct adherence to food hygiene during both food preparation and storage measures. Improper food storage, undercooking and cross-contamination are specific risk factors for domestic outbreaks of foodborne pathogens which may be responsible for 30% of all Salmonella outbreaks in the home.² The majority of unsafe food hygiene practices reported in this review were associated with inadequate provision of potable water and poor environmental hygiene which contradicts a review conducted in Plateau²⁰ that analyzed a significant proportion of food handlers were not trained in food handling/preparation and emphasized that unsafe food handling practices were still commonly found during the preparation of food among food handlers; thus increasing the potential risk of illness from food poisoning. Consequently, to reduce food borne illness it is crucial to gain an understanding of the interaction of prevailing food hygiene perception, knowledge, and practices of food handlers.¹¹ A number of studies however, have indicated that although training may bring about increase knowledge of food safety, it does not always result in a positive change in food handling practices.^{8, 14}

Most food hygiene surveys report that a high percentage of individuals, responsible for preparing meals for themselves and other family members, have not been properly informed about food hygiene procedures, especially with respect to health risks during preparation in the home.² The findings of this study confirmed that the home environment completes the food hygiene and food chain pathway and thus, represents an important site for the spread of pathogens responsible for foodborne diseases. This information highlights the lack of knowledge and inadequate behaviour that consumers adopt during food purchase, storage and preparation. Information and educational programs should not be limited to appearance when a safe food product is purchased. Currently, domestic food handling is unlikely to reach the same level as food hygiene control in food industry preparation.

However, overall hygiene procedures such as food handling, storage and preparation need to be indicated to consumers. Further studies will be necessary among other groups of consumers in different geographical areas are necessary

The associations between respondents' sociodemographic variables and food hygiene practices revealed that there was a significant relationship between sociodemographic variables (sex and tribe) and the level of food hygiene practices as evidenced by calculated p-value. Therefore, there was statistically significant association between sociodemographic variables and the level of practice of food hygiene among residents ($p < 0.05$). This was contrary to a study conducted in Ghana among street food vendors which revealed that sociodemographic variables do not predict the practice of food hygiene.¹³ This finding was consistent with a study in India which revealed that there was a statistically significant association between demographic variables such as, nationality, religion, education, marital status, duration of employment, with knowledge of food handlers.²⁷ A similar study conducted in Plateau State revealed a statistically significant relationship between age and the practice of food hygiene¹⁷

5. Conclusion

The data gathered from this study revealed that majority of the residents in Edu Local Government Area of Kwara State have good knowledge and perception on food hygiene. The level of practice of food hygiene was low despite good knowledge and perception. Therefore, findings from this study also clearly showed that good knowledge and perception on food hygiene does not necessarily translate into good practices.

Recommendations

Therefore, food handling practices should be enforced, and food hygiene inspection guidelines should be developed and institutionalized by the appropriate authority.

Limitations of the Study

Practice was assessed through self-reports, which could be exaggerated however, many questions were asked to ensure the consistency of the responses.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that there was no conflict of interest in publishing this paper

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

Author's contributions

- Mrs. Amina Jummai Shehu- Conceptualization; Literature Review; Writing; Data Collection & Data Analysis;
 - Prof. Aderibigbe Sunday Adedeji- Project oversight; Mentorship & Manuscript Reviewer
 - Dr. Bilqis Wuraola –Muhammad ALATISH- Manuscript Reviewer
 - Prof. Bolarinwa Oladimeji Akeem-mentorship and content reviewer
 - Dr Muhammad Lawan Gana-manuscript proofreading and error correction
 - Prof. Usman Sunusi Usman-content review and manuscript editing
 - Dr Aliyu Mohammed Maigoro-proofreading; content review and manuscript editing
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