## Psycho-Cognitive Factors Associated with Food Safety Practices among Mothers of Children Under-Five Years in Alimosho Local Government Area, Lagos State, Nigeria

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#### Abstract

**Objective:** This study sort to determine the levels of knowledge, attitude, perception, and practice food safety among mothers with children under five in Lagos, Nigeria.

**Methodology:** A cross sectional survey design guided by a behavioral theory employing 50 item validated questionnaires to collect data from 412 mothers in Alimosho LGA was used. Variables measured includes; knowledge of food-safety, attitude, perception and food-safety practices. Data collected were analyzed using SPSS version 23 to compute means and standard deviation from aggregated weighted scores of items and bivariate analysis to characterize the relationship between variables at p < 0.05.

**Results:** Majority (68.5%) of the mothers have never had formal training on food safety, level of knowledge of mothers on food safety (8.4 $\pm$ 1.80), attitudinal disposition (9.53 $\pm$ 1.9), perception (28.3 $\pm$ 4.1) and food safety practices (22.50 $\pm$ 4.90) scores were above average respectively. The bivariate analysis shows a strong statistical relationship, knowledge (r= 0.177; p. value 0.001), attitude (r= 0.193; value 0.001) and perception (r= 0.195; value 0.001) were positively correlated.

**Conclusion:** Knowledge, attitudinal disposition and perception were predictors of food safety practices. However, other variables not factored into this study may be good predictors of food safety practices. Hence, it is imperative that food safety laws and regulations are enforced by the government.

Keywords: Food-safety, Knowledge, Attitude, Perception.

### Introduction

Food serves as a vehicle for many pathogenic and toxigenic agents that causes what are known as food-borne diseases or food poisoning <sup>[13]</sup>. In recent decades, food poisoning has become a growing public health problem worldwide, in both developed and developing countries <sup>[11]</sup>. The incidence of food-borne illness depends on the hygienic measures implicated in food production and storage, but they could be ineffective if consumers have poor hygienic practices and food handling approaches <sup>[10]</sup>.

However, household food safety practice, particularly of mothers, is rarely studied, and the associated factors are poorly understood. Mothers are the first contact with and they provide and prepare food eaten by children especially under five children who have underdeveloped immune systems. It is very important to understand the interaction of the prevailing food safety, knowledge, attitude, perception and practices of food handlers in reducing food-borne outbreaks <sup>[11]</sup>. Earlier studies <sup>[12]</sup>, have showed that knowledge of food safety is associated with food safety practice. Other studies <sup>[4]</sup> have indicated that food safety and hygiene knowledge may not be translated into food safety practice. Another study showed a negative correlation between knowledge and practice <sup>[2]</sup>. This may be because surface level knowledge may not contemplate for attitudinal change to the desired level and interpreted into meaningful practice. Attitude plays a significant role in food safety practice <sup>[8]</sup>.

Knowledge is essential to safe food handling and many studies have focused on improving the food safety education of consumers <sup>[6]</sup>. Haapala and Probart <sup>[7]</sup>, reported that in developed countries national initiatives are launched to find techniques to effectively educate food consumers. Nonetheless, <sup>[5]</sup> highlight that only limited research has focused on obtaining information on food safety knowledge and practices associated with improper food handling at home in some developing countries.

This study therefore aims to assess food safety knowledge, attitude, perception and practices among mothers in Alimosho local government, Lagos state, Nigeria.

There is paucity in literature on individual's knowledge, attitude and perception in practicing food safety, this study made a difference from previous studies by applying the Health Belief Model (HBM) as a theoretical framework because it is a psychological model developed and tested predict human behavior. The study seeks to investigate the knowledge, attitude, perception, and practices as it correlates to food safety among mothers with under-five children.

Therefore, the study proposes the following hypotheses

- 1. There is significant statistical relationship between Knowledge of mothers with under 5 children and Food Safety practices.
- 2. There is significant statistical relationship between Attitude of mothers with under 5 children and Food Safety practices.
- 3. There is significant statistical relationship between perception of mothers with under 5 children and Food Safety Practices.

## **Materials and Methods**

### Study Design, Population, and Location

This study adopted a descriptive crosssectional design that made use of a quantitative method of data collection from February to March 2020. A 50-item semi-structured questionnaire with reliability of 0.93 was used to collect data from four hundred and twelve 412) mothers in Alimosho Local Government Area, Lagos State by multistage sampling of primary health centers in the area. Questionnaires were self-administered by the Mothers with the aid of research assistants who were properly trained to collect data from the participants.

### **Inclusion Criteria**

Consenting Mothers with children aged 0-5.

### **Exclusion Criteria**

Mothers with children aged 6 and above and non-consenting mothers.

#### **Instrument for the Study**

The semi-structured 50-item questionnaire was used to collect information from respondents; each section represented a variable to be studied and was developed from the objectives of the study. The questionnaire was divided into five sections: section А addressed Sociodemographics of respondents such as age, religion, marital status, occupation, ethnicity, training academic qualification and food experience, section B assessed knowledge on food safety among mothers, section C determined the attitude of mothers towards food safety and practices and section D determined the perception of food safety and practice among mothers and section E assessed the practice food safety among mothers. The Health Belief Model (HBM) was considered as a theoretical framework during development of the questionnaire for this study.

#### **Measures of variables**

The Socio-demographic characteristics of participants were determined using 7-items with options to be chosen. The first item had 5 options, the second item had 2 options, the third item had 4 options, the fourth item had 5 options, the fifth item had 3 options, the sixth item had 3 options and the seventh item had 5 options.

In Section B, eleven (11) questions having Dichotomous answers (yes or no) were used to measure mother's knowledge of food safety on a 11-point rating scale. The answer "yes" was coded as one (1) while the answer "no" was coded as zero (0).

In Section C, 7 questions were used to collect information on the attitude of mothers towards food safety and practices on a 21-point rating scale. Attitude was measured on a Likert scale with responses ranging from *Strongly Agree*, *Agree*, *Disagree and Strongly Disagree* coded from 0, 1, 2, and 3 respectively depending on the nature of the question.

Section D measured perception of food safety and practices among mothers with 15 items measured on a 45-point rating scale. Perception was measured on a Likert scale with responses ranging from *Strongly Agree, Agree, Disagree and Strongly Disagree* coded from 0, 1, 2, and 3 respectively depending on the nature of the question. Food safety practices of mothers was measured on a 30-point reference scale having 10 questions and a Likert scale ranging from *Not at all, Rarely, Occasionally and Very often.* Responses were assigned scores of 0, 1, 2, and 3 to highlight the practice of participants.

#### **Data Analysis**

obtained Data from correctly filled questionnaires were coded, analyzed and interpreted using descriptive statistical methods and statistical package for Social Science (SPSS) version 23.0. Summaries of descriptive statistics such as frequency, mean, standard deviation were derived and represented using tables, figures, and charts for lucidity. Correlation was used to determine the relationships between variables of different sections and Regression was used to determine which variable best predicts food safety practice.

#### **Ethical Considerations**

Ethical approval was obtained from Babcock University Health Research Ethics Committee (BUHREC). Informed consent was also given through verbal communication and written consent forms were signed. Information provided by respondents was kept confidential and there was no penalty for not filling the form or withdrawing at any time.

### Results

# Socio-demographic characteristics of respondents

One half (50.0%) of the respondents are within age group "20-29", while age bracket 30 - 39accounts for 30% and between 40-49 (20%), majority (83.5%) of the respondents are dominated by Christians and with Islamic religion accounts for (16.5%) are Muslims. More than half (64.5%) of the respondents are of Yoruba origin. Igbo ethnic group were (23.5%) while (1.3%) are Hausa/Fulani. Majority of the study participants are self-employed (55.5%), while more than half (68.5%) have never had any form of food safety training. See table 1 for details. (Table 1).

#### **Knowledge of Food Safety**

Level of knowledge was measured on 11 points rating scale on a 11 item questions, given a mean score and corresponding standard deviation  $(8.4\pm1.80)$ , valid for 400 respondents (n=400)

(Table 3). This can be interpreted that Majority of the respondents 74% believed that food can cause illnesses and they agreed that food safety is removing illnesses causing factors in food. Some respondents 21% thought it was not necessary to cover hair while cooking while 42.5% of the total respondents believed raw milk is healthy for children. A favorable score of respondents showed a mean score on Knowledge which indicated that they have good Knowledge. Knowledge variable was measured on 11 points rating scale and the mean score for all respondents is 8.40, SD 1.86 valid for 400 respondents (n=400). The score translates to the fact that majority of the respondents have good knowledge of food safety. So, mothers had good knowledge. (Table 2).

# Attitude of mothers towards food safety and practice

On attitudinal disposition relating to food safety indicates that attitude was measured a 21point rating scale on a 7-item questions reported a mean and standard deviation  $(9.5\pm1.9),$ corresponding to a prevalence of 45.2%, which is less than average 43% of the sample size agreed strongly that they need to other about food safety ad 66% are careful to store food at the right temperature. Thirty-eight percent 38% disagreed strongly and didn't believe that waste I cooking area did not affect food safety and 38.3% are reluctant to cook when they have cough as they understand that it may compromise food safety.

A favorable score of respondents showed high mean score on attitude which indicated that they have good attitudinal disposition concerning the food safety and that could in-turn results to improved food safety practices. Attitudinal variable was measured on 21 points rating scale and the mean score for all respondents is 9.53, SD 1.9 valid for 400 respondents (n=400). The score translates to the fact that majority of the respondents have negative attitude towards food safety. So attitudinal disposition of mothers is not appropriate concerning food safety.

# Perception of Food Safety Practices among mothers

The perception of respondents was measured on 45-point rating scale and a corresponding mean and standard deviation of  $(28.3\pm4.1)$ , translating to 62.9% valid for 400 respondents (n=400) (Table 3). Using the Health Belief Model (HBM), perception was divided into Perceived Perceived susceptibility, severity, Perceived barrier and Perceived benefit. **Summaries** of respondents perceived susceptibility, severity, barrier, benefit and selfefficacy indicated that more than half of the respondents 88.3% had a positively perceived susceptibility, 61% had negatively perceived severity and 81.8% had positive perceived selfefficacy to practicing food safety, 57.5% reported negative perceived barriers and 78.3% positively perceived benefits of practicing food safety. Majority of the respondents agreed that their child can get sick through food ad 52.8% believed food borne illnesses is not a serious matter but 43.3% think unsafe food can cause death this means Perceived Severity is low. More than half of the respondents believed they can prevent other people from getting food borne illness through their actions and 55.3% believed their children stay healthy if they practice food safety. Although 38.8% stated that there is not proper waste disposal system in their area which may be a barrier to good food safety practices. Perception of mothers was responsible for high food safety practices.

#### Food safety practice among mothers

The Food safety practices measured on a 30point rating scale reported a mean and standard deviation of  $(22.5\pm4.9)$ , demonstrating a high involvement of mothers in the practice of food safety. valid for 400 respondents (Table 3). Majority 65.8% of the respondents buy fresh food very often and 68.3% don't use water from any source to cook, 12% keep leftovers for more than 24 hours, 67.3% use soap and water to wash hands regularly after using the toilet, 57.5% clean storage area before storing new food while 36.8% wear head covering when they are around food. The mean score is above the average score so this shows a good food safety practices among mothers.

The research hypotheses for this study proposed an association between the three independent variables and the dependent variable. When tested at 5% level of significance, the study revealed a significant relationship between the knowledge of food safety and food safety practices (r= 0.177; p=000). Also, there was a significant relationship between the attitude of mothers and food safety practice (r= 0.193; p=000), there is also significant relationship between perception of mothers and food safety practices (r= 0.195; p=000).

## Discussion

This study assessed the psycho-cognitive factors which included; knowledge, attitude, and perception of food-safety practices among mothers with under 5 children in Alimosho LGA local government area Lagos state, Nigeria; and overall, it revealed that knowledge, attitude and perception were significantly associated with the level of food-safety practice of mothers, a study driven by a behavioral model, the Health Belief Model. The overall passing rate for this section was at 91.8%, highlighting that mothers in Alimosho LGA had good knowledge with regard to food safety. Overall respondents had good knowledge but respondents with university and postgraduate education had better knowledge in comparison to respondents with primary and secondary education similarly to a study conducted in Saudi Arabia<sup>[5]</sup>. Age of mothers did not affect their knowledge because all age groups had good knowledge. Overall, less than half of the respondents had good attitude toward food safety which is similar to a study conducted in Ethiopia, respondents with good attitude also reported to have better food safety practices which is similar to Lum et al <sup>[9]</sup>. The attitude score remained lower than knowledge score thus there is a considerable gap between level of knowledge, attitude and food safety practice among mothers in Alimosho LGA. The perception of mothers was measured on 45-point reference scale with 83.8% of the respondents having above average perception about food safety practices. this is relatively high compared to level of knowledge and attitudinal disposition among the respondents in this study. Mothers with a good score of knowledge level had better food safety practice. This is in line with earlier studies <sup>[3,12]</sup>. Study subjects with a poor score of attitudes toward food safety also had reported poor and below average food safety practice. This finding is more or less similar with earlier studies [14]

Variables	Respondents in the study N=400			
	Frequency (N)	Percentage (%)		
Age in years				
20-29	200	50		
30-39	120	30		
40-49	80	20		
Religion				
Christian	334	83.5		
Muslim	66	16		
Ethnicity				
Igbo	96	23.5		
Hausa/Fulani	5	1.3		
Yoruba	258	64.5		
Others	43	10.8		
Occupation				
Self-employed	220	55.0		
Others	180	45.0		
Level of education				
Primary	6	1.5		
Secondary	167	41.8		
University	184	46.0		
Postgraduate	43	10.8		
Marital status				
Single	142	35.5		
Married	256	64.0		
Separated	2	0.5		
Food Safety Training				
Yes	126	31.5		
No	274	68.5		

Table 1. Socio-demographic characteristics of respondents

 Table 2. Knowledge of respondents on Modern Contraceptives

S/N	Knowledge	YES	%	NO	%
1.	Food can cause illnesses	297	74.3	103	25.8
2.	Food safety is removing illness-causing factors in food	336	84	64	16
3.	Hypertension can affect food safety	150	37.5	250	62.5
4.	Hand washing reduces food contamination	350	87.5	50	12.5
5.	Proper cleaning of kitchen utensils increases food contamination	64	16	336	84.0
6.	Covering hair is not necessary while preparing food	84	21	316	79
7.	Typhoid can be transmitted through food	254	63.5	146	36.5
8.	Vegetables can be easily contaminated	318	79.5	82	20.5
9.	Long and dirty nails can contaminate foods	355	88.8	45	11.3
10.	Well cooked food is free from contamination	316	79	84	21
11.	Raw cow milk is healthy for children	168	42	232	58

Variables	Respondents in N= 400	the study	
	Rating Scale	Mean	SD
Knowledge	11	8.4	1.8
Attitude	21	9.5	1.9
Perception	45	28.3	4.1
Food Safety Practice	30	22.5	4.9

Table 3. Mean and Standard Deviation

S/N	Attitude	SA (%)	A (%)	D (%)	SD (%)
1.	I need to bother about food-safety	172(43.0)	144(36.0)	45(11.3)	39(9.8)
2.	I am careful to store foods at right temperature	101(25.3)	264(66.0)	18(4.5)	17(4.3)
3.	I am sure water from any source while preparing food will not affect food-safety	38(9.5)	76(19.0)	118(29.5)	168(42.0)
4.	I believe waste in cooking and serving area will not affect food-safety	30(7.5)	68(17.0)	150(37.5)	152(38.0)
5.	I am reluctant to cook food when I have cough	60(15.0)	153(38.3)	125(31.3)	62(15.5)
6.	I believe proper hygiene can prevent food- borne illnesses	202(50.5)	109(27.3)	42(10.5)	47(11.8)
7.	I believe there is no harm in cooking with expired ingredients	267(66.8)	83(20.8)	32(8.0)	18(4.5)

 $\label{eq:constraint} \textbf{Table 4.} \ \textbf{Attitude of Mothers towards Food Safety and Practices}$ 

Table 5. Perceived susceptibility of food borne illnesses

S/N	Perceived Susceptibility	SA (%)	A (%)	D (%)	SD (%)
1	My child can get sick through food	104(26.0)	179(44.8)	68(17.0)	49(12.3)
2	I don't think I can fall sick by food	22(5.5)	75(18.8)	183(45.8)	120(30.0)
3	There is no probability that my child can get Food borne illnesses as a result of my actions.	65(16.3)	101(25.3)	120(30.0)	114(28.5)

S/N	Perceived Severity	SA (%)	A (%)	D (%)	SD (%)
1	Food- borne illness is not a serious matter	34(8.5)	211(52.8)	128(32.0)	27(6.8)
2	Unsafe food can cause death	173(43.3)	169(42.3)	27(6.8)	31(7.8)

S/N	Perceived Self-Efficacy	SA (%)	A (%)	D (%)	SD (%)
1.	I can prevent people from getting food-borne illness	108(27.0)	220(55.5)	23(5.8)	49(12.3)
2.	I can prepare food hygienically	196(49.0)	166(41.5)	23(5.8)	15(3.8)

Table 7. Perceived Self-Efficacy in practicing food safety

Table 8.	Perceived	benefits	of food	safety practices	s
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S/N	Perceived Benefits	SA (%)	A (%)	D (%)	SD (%)
1	My children stay healthy if I practice food safety	221(55.3)	136(34.0)	23(5.8)	20(5.0)
2	Food safety costs me time and money	123(30.8)	150(37.5)	93(23.3)	34(8.5)
3	I don't have to worry about sickness when I practice food safety	133(33.3)	164(41.0)	68(17.0)	35(8.8)
4	I can prepare food hygienically	186(46.5)	172(43.0)	24(6.0)	18(4.5)

Table 9. Perceived barriers to food safety practices

S/N	Perceived Barriers	SA (%)	A (%)	D (%)	SD (%)
1	I don't have time to worry about food safety	32(8.0)	38(9.5)	181(45.3)	149(37.3)
2	There is no proper waste disposal system in my area	68(17.0)	155(38.8)	107(26.8)	70(17.5)
3	Clean water is hard to find in my area.	37(9.3)	69(17.3)	169(42.3)	125(31.3)
4	Food safety is expensive.	52(13.0)	116(29.0)	159(39.8)	73(18.3)

S/N	Practice	NA (%)	R (%)	O (%)	VO (%)
1.	I buy fresh food	33(8.3)	23(5.8)	81(20.3)	263(65.8)
2.	I use water from any source to cook	273(68.3)	50(12.5)	20(5.0)	57(14.3)
3.	I clean storage area before storing new food	19(4.8)	44(11.0)	107(26.8)	230(57.5)
4.	I don't wash utensils before and after cooking	274(68.5)	47(11.8)	25(6.3)	54(13.5)
5.	I store food at the right temperature	40(10.0)	67(16.8)	120(30.0)	173(43.3)
6.	I wear head covering when I am around food	65(16.3)	108(27.0)	80(20.0)	147(36.8)
7.	I wash hand with soap and water after I use the toilet	28(7.0)	41(10.3)	62(15.5)	269(67.3)
8.	I separate food items to avoid cross contamination	30(7.5)	69(17.3)	90(22.5)	211(52.8)
9.	I cook meats and poultry products thoroughly	16(4.0)	40(10.0)	78(19.5)	266(66.5)
10.	I keep leftovers for more than 24 hours	201(50.3)	96(24.0)	55(13.8)	48(12.0)

Table 10. Food Safety Practices among mothers

## Conclusion

This study assessed the food safety knowledge, attitude, perception and practices among mothers in Alimosho LGA. The information could be used as a starting point to design education and training programs that can further improve their knowledge, Attitude ad perception and can be translated into better and safer food handling practices. Food safety efforts generally tend to focus on food supply chains and the household domain of food handling and practices gets limited attention. Food handlers in households need effective and methodical education and training to safeguard themselves and their families from getting food-borne illnesses. It is, therefore, recommended that authorities, researchers, educators, media, and food safety communicators should initiate education programs, with special focus on the high-risk groups like mothers and food handlers at home to advance the food safety knowledge, attitude, perception and safer food practices.

Finally, this research did not include direct observations such as food and drinking water quality, storage, cooking setting, and washing facility at households. Hence, the self-reported food safety practice level of mothers might be high because of social desirability bias.

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## References

[1] Abdullai A., Hassan A., Kadarman N., Saleh A., Shu'aibu Y. B., Lua, P. L., 2016, Food safety knowledge, attitude and practice towards compliance with abattoir laws among the abattoir workers in Alasyia. *International Journal of General Medicine*, 16(9), 79-87.

[2] Ansari-larim, Soodbakhsh, S., Lakzadeh L. 2012, Knowledge attitude and practices of workers on food hygienic practices in meat processing plants in Fars, Iran. *Food Control Journal*, 21(10), 260-63.

[3] Asmawi, U. M., Norehan, A. A., Saliklin, A., Rosdi, A., Munir, N. A., Basri, N. B., 2018, An Assessment of Knowledge, Attitudes and practices in food safety among food handlers engaged in food courts. *Current Research in Nutrition and Food Science Journal*, 6(2), 346-353.

[4] Bamidele, J. O., Adebimpe, W. O., Oladele, E. A., & Adeoye, O. A., 2015, Hygiene practices among workers in local eateries of Orolu community in south Western Nigeria. *Annals of Medical and Health Sciences Research*, 5(4), 235–240.

[5] Farahat, M. F., El-shafie, M. M., Waly, M. I., 2016, Food safety knowledge and practices among Saudi women. *Food control journal*, 4(7), 427-435.

[6] Garayoa R., Cordoba, M., Gracia-Jalon I., Sancheez-Villegas A., Vitas, A.I., 2005, Relationship between consumer food safety knowledge and reports behavior among students from health sciences in one region of Spain. *Journal of food protection*, 68(12), 2631-6.

[7] Haapala, I., Probart, C., 2004, Food safety knowledge, perceptions, and behaviors among middle school students. *Journal of nutrition education and behavior*, 36(2), 71-6.

[8] Lee H. K., Abdul H., Thong K. L., Chai L. C., 2017, Assessment of food safety knowledge, attitude, self-reported practices and microbiological hand hygiene of food handlers. *International journal of Environmental Research and Public Health*, 14(1), 55.
[9] Lum, L., Albrecht, J. A., Yaseen, M., Litchfield, R., Ritter-Gooder, P., 2013, Food handling practices and knowledge among families with young children. *Food Prot. Trends*, 3(3), 358–375.

[10] Mkhungo M. C., Oyedeji A. B., Ijabadeniyi O. A., 2018, Food safety knowledge and microbiological hygiene of households in selected areas of Kwa-Zulu Natal, south Africa. *Ita. J. Food Saf.*, 7(2), 6887.

[11] Quinlan, Jennifer, 2015, Foodborne illnesses incidence rates and food safety risks for populations of low socio-economic status and minority race/ethnicity: a review of the literature. *International journal of environmental research and public health*, 10(8), 3634-52.

[12] Rahman, M. M., Arif, M. T., Bakark, Talib, Z., 2016, Food safety knowledge attitude and hygiene practices among the street food vendors in northern Kuching city Sarawak. *Borneo Sci.*, 3(1), 94-103.

[13] World Health Organization (WHO), 2015 WHO Estimates of the Global Burden of Food borne Diseases: Food borne Disease Burden Epidemiology Reference Group 2007–2015; WHO: Geneva, Switzerland.

[14] Yarrow, L., Remig, V. M., Higgins, M. M., 2009, Food safety educational intervention positively influences college students' food safety attitude, beliefs, knowledge, and self-reported practices. *Journal of Environmental Health*, 71(6), 30-35.