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**Original Research Article**

# Knowledge, attitudes and practices of food hygiene among mobile food vendors in a Nigerian rural settlement

**Francis Owoicho Aluh[1], Deborah Oyine Aluh[2]***

[1]Department of Community Medicine, Imo State University Teaching Hospital, Orlu, Imo State, Nigeria
[2]Department of Clinical Pharmacy and Pharmacy management, University of Nigeria, Nsukka, Enugu State, Nigeria

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***Correspondence:**
Miss. Deborah Oyine Aluh,
E-mail: aluhdeborah@yahoo.com



## ABSTRACT

**Background:** An estimated 2.5 billion people patronize mobile food vendors worldwide. Most vendors however have little or no formal education, which makes them unable to appreciate the most critical food handling practices. Consumers have thus borne the consequences when food is unsafe. This study aims to determine the Knowledge, Attitudes and Practice of Food hygiene amongst mobile food vendors in a rural settlement.
**Methods:** It was a cross-sectional descriptive survey among the study population which comprised of mobile food vendors in Orlu Local Government Area in Imo state, Nigeria. Semi-Structured questionnaires written in English were administered to mobile food vendors who could read. For low literates, the interview was conducted in their local dialect by a trained research assistant.
**Results:** Respondents were mainly females (94.1%, n=192) and between the age of 31 and 40 years (40.2%, n=82). More than half of the respondents had secondary school education (59.8%, n=122).The mean percentage knowledge was 78%. Less than half (43.5%, n=89) of the respondents had an appropriate attitude towards Food hygiene. There was a strong evidence of association ($\chi^2$=15.582; p=0.0001) between Knowledge of food hygiene and attitudes towards food hygiene.
**Conclusions:** Knowledge levels of food safety practices amongst street food vendors in this rural setting was high however, this high knowledge was generally not translated into practice.

**Keywords:** Food hygiene, Knowledge, Attitudes, Rural, Food vendors

## INTRODUCTION

It is estimated that 40% of the Urban population in the developing world eat street foods because it is cheap. An estimated 2.5 billion people patronize mobile food vendors worldwide.[1] It is also a major source of income to the vendors, especially women, requiring low capital investment.[2] Most vendors however have little or no formal education, which makes them unable to appreciate the most critical food handling practices.[3,4] Consumers have thus borne the consequences when food is unsafe. The extent of the problem is difficult to estimate particularly in developing countries but given that in excess of 2million people, mostly children, die from diarrhoea each year, a great proportion of these cases can be attributed to the contamination of food as well as drinking water.[5] Although street food has become an indispensable part of both urban and rural diets, some public health risks are associated with the consumption of street food in developing countries.[6-9] While it is expected that street foods meet the nutritional requirements of consumers, it is also necessary to ensure its safety from contaminants and micro-organisms.

In Nigeria, a substantial proportion of food eaten outside the home is prepared and sold by street vendors. Being reasonably priced and conveniently available, street food satisfies a vital need for the population. The ready-to-eat foods and beverages prepared and/or sold by the vendors (the so-called 'mama put') can be a source of an epidemic of food poisoning because they typically have poor knowledge of food safety method.[10]

A study on Food safety knowledge and practices of mobile food vendors carried out in Abeokuta, Southwest Nigeria showed that only 12% of the respondents acquired knowledge of food preparation by formal training; 31% had annual medical health certificates to indicate they had carried out the recommended physical and medical examination. Volume and price were considered more than freshness and cleanliness when purchasing raw materials.[11] In a similar study carried out in Owerri, Nigeria, 23.8% prepared their food under unhygienic conditions. 42.8% did not use Aprons, 47.6% handled food with bare hands and 52.4% wore no hair covering. 61.9% and 19.5% handled money and jewellery respectively while serving food. 28.7% blew air into polythene bags before use.[10]

Although numerous studies on food hygiene and safety have been conducted in Nigeria, they are mainly limited to urban areas. There is therefore paucity of data on the levels of compliance among street food vendors in rural areas such as the setting in which this study takes place. According to the recommended international code of practice of General principles of food hygiene adopted by the joint FAO/WHO Food Standards Programme and the Codex Alimentarius, food-borne disease illness and injury are at best unpleasant, at worst they may be fatal.[1,5] This study is necessary because observation reveals that the food hygiene practices of mobile food vendors in the study area is most times below standard; standard being what is defined above.

## METHODS

### *Study area*

Orlu is one of the 27 LGA's in Imo state. Orlu Local Government Area covers an approximate area of 202 square kilometres, with a population of 220,000. The people of Orlu settle in well-defined groups called autonomous communities.

### *Study design and population*

The study population comprised of mobile food vendors in Orlu Local Government Area. It was a cross-sectional descriptive survey aimed at assessing the knowledge, attitude and practice of food hygiene among mobile food vendors.

### *Study sample selection, data collection and analysis*

Ten out of the twenty-four autonomous communities were randomly selected and the mobile food vendors were selected purposively because they were mobile, unregistered and generally unwilling to spend time on answering a questionnaire. The study took place from June to August, 2017. Semi-Structured questionnaires written in English were administered to mobile food vendors who could read. For low literates, the interview was conducted in their local dialect by a trained research assistant. The questionnaire was pre-tested using 20 women in the study setting. The data obtained during the pre-test were not included in the study data. The level of knowledge was assessed on four items. For a single response question, a correct answer was scored 5; a false answer was scored zero. For a multiple response question, each correct answer was scored 5 and up to a maximum of 4 correct answers, a sub-total score of 20 was allocated and for a false answer, 0 was allocated. For each respondent, the overall knowledge scores were calculated as sum of correct answers ranging from 0 up to 40. The level of attitude towards food hygiene was determined by scoring questions that described appropriate attitude. For an appropriate attitude, a score of 5 was allocated and for an inappropriate attitude a score of 0 was allocated. The total maximum score for all the appropriate attitudes was 35. Data were entered and analysed by the researcher using the Statistical Package for Social Sciences (SPSS) version 16. Descriptive analyses were performed to characterize the sample population. Chi-square tests were made to find associations between the dependent and independent variables with significance set at $<0.05$. The questionnaire consisted to four sections: Socio-demographics, Knowledge, Attitude and Practice. Data was collected and analysed using SPSS version 21.

## RESULTS

Respondents were mainly females (94.1%, n=192) and between the age of 31 and 40 years (40.2%, n=82). More than half of the respondents had secondary school education (59.8%, n=122) while 3.43% (n=7) had no formal education. The socio-demographic characteristics of the respondents are presented in Table 1.

More than three-quarters of the mobile food vendors had heard of food hygiene before (81.4%, n=166) with workshops/Seminars being the most popular source of information (45.1%, n=92). More than half of the respondents (59.8%, n=122) knew that Diarrhoea could be contracted through lack of food hygiene while about nineteen respondents (9.31%) thought that lack of food hygiene could cause Malaria. More than three-quarters of the respondents acknowledged the need for regular medical check-up. For all the mobile food vendors surveyed, the mean percentage knowledge was 78% (Table 2).

**Table 1: Socio-demographic characteristics of respondents.**

| Characteristics | N=204 | Percentage (%) |
|---|---|---|
| **Sex** | | |
| Male | 12 | 5.89 |
| Female | 192 | 94.11 |
| **Age (Years)** | | |
| <20 | 27 | 13.23 |
| 20-30 | 33 | 16.17 |
| 31-40 | 82 | 40.19 |
| 41-50 | 45 | 22.05 |
| 51 and above | 17 | 8.33 |
| **Level of education** | | |
| No formal Education | 7 | 3.43 |
| Primary | 59 | 28.92 |
| Secondary | 122 | 59.80 |
| Tertiary | 16 | 7.84 |

**Table 2: Knowledge of respondents on food hygiene.**

| Variable | Category | Frequency (%) |
|---|---|---|
| **Have you heard of food hygiene?** | Yes | 166 (81.37) |
| | No | 38 (18.63) |
| **Sources of information about food hygiene** | Workshop/seminar | 92 (45.09) |
| | TV/Radio | 50 (24.50) |
| | Customers | 29 (14.22) |
| | From other vendors | 22 (10.78) |
| | Others (e.g. School) | 11 (5.39) |
| **Lack of food hygiene can cause these diseases** | Diarrhoea | 122 (59.80) |
| | Typhoid | 50 (24.51) |
| | Malaria | 19 (9.31) |
| | HIV | 13 (6.37) |
| **Need for regular medical check-up** | Yes | 156 (76.47) |
| | No | 48 (23.53) |

*Multiple responses.

**Table 3: Distribution of respondents according to attitudes towards food hygiene.**

| Criteria | Category | Frequency (%) |
|---|---|---|
| **Protective clothing reduces the risk of food contamination** | Yes | 82 (40.19) |
| | No | 122 (59.80) |
| **Washing of hands before and after handling food is mandatory** | Yes | 129 (63.24) |
| | No | 75 (36.76) |
| **Conditions that prohibit a vendor** | Open wounds on hand | 48 (23.53) |
| | Catarrh | 53 (25.98) |
| | Cough | 75 (36.76) |
| **Most important consideration when buying food** | Freshness | 69 (33.82) |
| | Price | 50 (24.51) |
| | Quantity | 85 (41.67) |
| **When do you believe that water used in washing utensils should be disposed?** | Water changes colour | 86 (42.16) |
| | Water finishes | 49 (24.02) |
| | Others | 69 (33.82) |

**Table 4: Food hygienic practices and services provided.**

| Variable | Category | Frequency (%) |
|---|---|---|
| **Wears apron while preparing and serving food** | Yes | 140 (68.63) |
| | No | 64 (31.37) |
| **Covers hair while cooking and vending** | Yes | 127 (62.25) |
| | No | 77 (37.75) |
| **Frequency of cleaning nails** | Daily | 35 (17.16) |
| | Twice weekly | 62 (30.39) |
| | Weekly | 49 (24.02) |
| | Whenever its dirty | 16 (7.84) |
| **Periodic medical exam** | Yes | 102 (50.00) |
| | No | 102 (50.00) |
| **Training on food hygiene** | Yes | 124 (60.78) |
| | No | 80 (39.22) |
| **Different methods of treating drinking water** | Boiling | 86 (42.16) |
| | Addition of alum | 15 (7.35) |
| | By covering | 42 (20.59) |
| | Others | 61 (29.90) |

Less than half of the mobile food vendors thought that Protective clothing reduced risk of food contamination (40.2%, n=82) while more than half of them (63.2%, n=129) agreed that washing hands was mandatory before and after handling food. More respondents considered quantity (41.7%, n=85) to be an important consideration in purchasing food items than freshness (33.8%, 69). Only about a quarter of the respondents (23.5%, n=48) thought an open wound on the hand was a reason to prohibit them from preparing/vending food. About a quarter of the respondents admitted that they only changed water used in washing utensils after the water finished (24.0%, n=49) (Table 3).

More than half of the respondents wore Aprons (68.6%, n=140) while 62.3% (n=127) covered their hair while preparing and vending food. Less than a quarter (17.2%, n=35) respondents said they cleaned their nails daily while more than three-quarters (76.5%, n=156) said they had periodic medical examinations. Almost half of the respondents (n=39.2%) of the respondents had not had any prior training on food hygiene and boiling was the most popular form of water treatment amongst them (Table 4).

Having attitude scores greater than or equal to the mean attitude score of 55.16% was regarded as having a appropriate attitude while a score lower than that was regarded as Inappropriate attitude. Less than half (43.5%, n=89) of the respondents had an appropriate attitude towards Food hygiene. There was a strong evidence of association ($\chi2=15.582$; p=0.0001) between knowledge of food hygiene and attitudes towards food hygiene. There was also significant association between being trained on food hygiene and attitude towards food hygiene ($\chi2=20.745$; p=0.000).

## DISCUSSION

The mobile food vendors surveyed in Orlu Local Government Area had an overall good knowledge of Food hygiene. Majority of the mobile food vendors in this study were females. This is consistent with findings from similar studies in developing countries but contrary to findings in studies carried out in Asia and Nairobi, Kenya.[10-15] The study subjects were mostly between 20 and 40 years and mostly had a secondary school education which concurs with findings from other studies.[10,11,16,17] However, the food vendors surveyed in Nairobi, Western and Northern Nigeria had no formal education.[15,18-20]

In this study more than half of the respondents had a good knowledge of food hygiene with a mean knowledge percentage score of 78%. This may have been due to the high literacy levels of the food vendors surveyed. This finding agrees with results from similar studies in Nigeria and other African countries[16,20,21] but is in contrast with studies carried out in Asian countries where knowledge of food hygiene among the food vendors was abysmally low.[22,23]

Majority of the food vendors acquired their knowledge of food hygiene through workshops and seminars which contrasts with findings from other studies where mass media was the common source of information on food hygiene.[24,25] Though the mobile food vendors were not registered by the Local Government, the Local Government had organized a workshop for them on food hygiene which is a laudable effort as this workshop may have been a reason for the relatively high knowledge of food hygiene in this sample. This shows that the vendors are willing to attend Government organized workshops on food hygiene and the Onus lies on the local government to organise these. A majority of the

respondents in this study knew the food-borne diseases with diarrhoea being the most identified food-borne disease amongst the respondents. This finding is in concordance with finding from similar studies.[25,26]

The WHO and FAO have recommended that food handlers should be medically examined as a means to prevent the transmission of communicable diseases amongst food handlers and consumers.[1,5] Even though more than three-quarters (76.5%, n=156) of the food vendors knew the need for periodic medical check-up, only half of them actually carried out this periodic medical check-up. A similar practice was observed among vendors surveyed in Ghana.[27]

A study carried out in Ghana showed that food vendors with formal training were more likely to adopt good food hygiene practices.[27] In this study, there was a significant association between being trained on food hygiene and attitude towards food hygiene ($\chi^2$=20.745; p=0.000). Even though knowledge of food hygiene was relatively high amongst the vendors surveyed in this study, it is particularly worrisome that for the majority of the vendors considered quantity more important than freshness when purchasing food and addition of alum was a method of water treatment amongst some vendors. The latter is a dangerous practice which should be discouraged as the water is served to the public.

## CONCLUSION

Knowledge levels of food safety practices amongst street food vendors in this rural setting was high however, this high knowledge was generally not translated into practice. The need for increased vigilance and control of the food vendor's practices through the enforcement of regulations, proper hygienic practices and food safety control measures by local authorities that are empowered to perform their functions cannot be overemphasized. Regular training and periodic retraining sessions for the food vendors should be organised and incentives may be given to the vendors who carry out proper hygiene practices to encourage them. Food vendors who deviate from set standards of hygiene should be culpable to the regulatory body and sanctioned if necessary e.g. Paying fines if caught without an Apron or hairnet. These will serve as deterrent to those who refuse to adhere. Food hygiene should be taught in schools, particularly the primary and secondary schools which are the levels where most of the vendors stop their formal education.

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