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Food Safety Knowledge and Practice of Street Food Vendors in Rural Northern Ghana

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Abstract Food safety amongst street food vendors is becoming a major public concern especially in urban areas of the developing world where this industry is expanding rapidly. There is rarely any information on street food safety issues in rural northern Ghana where this industry is equally growing rapidly. We therefore conducted this study to assess the knowledge level and evaluate food safety and hygiene practices amongst street food vendors in a rural district of northern Ghana. A cross sectional study was carried out in the Nadowli district where 200 street food vendors were randomly selected from of both densely and none densely populated areas of food vendors. Knowledge level amongst vendors concerning food safety practices was 100%. Although over 96% washed their hands after some major activities, about 13% of them did not use soap. The main storage forms of leftover foods were consumption by friends and family members (13%), reheating (13%) and refrigeration (11.5%). Water storage containers were also found to be used for other activities. 71% of the vendors had undergone medical screening despite a high knowledge level (100%) of its importance. Street food vendors in this rural northern setting generally have a high knowledge level on food safety issues but however do not translate this knowledge into practice.

Keywords Northern Ghana, Food Safety, Street Food Vendors, Rural

1. Introduction

The World Health Organization defines street foods as ready-to-eat foods and beverages prepared and or sold by vendors on the street and in public places for immediate consumption or consumption at a later time without further processing or preparation. These foods include meat, fish, fruits, vegetables, grains, cereals, frozen produce and beverages [1]. This food industry provides a significant amount of employment, mainly to those with little education and training and often responsible for the feeding of millions of people with a wide variety of foods daily that are relatively cheap and easily accessible [2].

In the last few decades, the street food industry has expanded rapidly especially in urban areas of low- and middle-income countries, in terms of providing access to a diversity of inexpensive foods for low- income households in particular [3]. However, this expanding sector is not without its own problems as food safety is now a major public health concern where serious outbreaks of food borne diseases have been documented in the past decade, illustrating both the public health and social significance of these diseases especially amongst children were the impact is most felt [4]. In Africa, the incidence of both food and water borne diseases is estimated at 3.3 to 4.1 episodes per child per year accounting for between 450,000 to 700,000 deaths in children annually, with many more sporadic cases remaining unaccounted for [5]. Some studies in Africa have shown that the tremendous unregulated growth of street food vendors has placed a severe strain on city resources, such as water, sewage systems and sometimes even interfere with city planning through congestion and littering which tend to adversely affect daily life [6, 7].

Lots of efforts have been made by health ministries of developing countries in the field of food safety and hygiene education amongst street food vendors. Although these efforts have led to an increase in awareness and knowledge levels of food safety and hygiene practices, this knowledge is however not always translated in to actual practice [8, 9].

Concerns over food borne diseases in Ghana have led to efforts by the relevant authorities to improve on food safety measures and also encourage vendors to adopt more hygienic practices over the past decade [10, 11]. Much of these efforts however appear to be concentrated in the urban areas to the neglect of rural communities as evidenced in a number of studies carried out to evaluate food safety practices in urban areas of Ghana [11- 16].

The District Health Management Teams (DHMT) in collaboration with the district assemblies in rural Ghana

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regulates and educates street food vendors on food safety and hygienic practices. There is currently scarcity of data and knowledge on awareness level and food safety practices on street food vendors in rural Ghana and especially in rural northern Ghana. It is therefore in view of this that we conducted a study to assess the knowledge level and evaluate food safety and hygiene practices amongst street food vendors in the Nadowli district of northern Ghana.

2. Methodology

2.1. Study Area

The Nadowli District is located in the heart of the Upper West Region of Ghana. It lies between latitude 11º 30' and 10º 20' north and longitude 3º 10' and 2º10' west. It is bordered to the west by Burkina Faso. It is one of the least developed in terms of infrastructure in the region. It is vast and mainly rural with a population density of about 32.8 persons per square kilometer, living in about 170 settlements grouped into eight sub- districts.

2.2. Study Design and Population

This was across sectional study conducted in 2013 from the beginning of April to the end of May comprising of street cooked vendors in the Nadowli district.

2.3. Sampling, Data Collection and Statistical Analysis

Four out of the eight sub-districts in the district were randomly selected from both densely and none densely populated areas of street food vendors based on the district assembly's data base of trained and certified street food vendors after which 200 of them were randomly selected for the study. Face to face interviews were then conducted using a semi structured questionnaire.

Data was entered, organize, cleaned and analyzed using Statistical Package for Social Scientists (SPSS) software version "20.0" (SPSS Inc., Chicago, Illinois, USA)

2.4. Ethical Considerations

Approval for this study was gotten from the Department of Community Health and Family Medicine of the School of Medicine and Health Sciences, University for Development Studies; Regional Health Directorate of the Upper West Region; District Health Directorate of Nadowli and the Nadowli District Assembly. Verbal consent was obtained from each street food vendor before data collection.

3. Results and Discussion

3.1. Demographic Characteristics

In this study, majority (94.5%) of the food vendors were found to be females whiles the rest (5.5%) were males **(table 1)**. This is consistent with what generally pertains in the developing world and especially in Africa where women tend to play very important roles in all street food vendor activities [18]. Similar findings were also observed in two earlier Ghanaian studies [10, 17]. Similarly, Comfort O. Chukuezi also found women preponderance amongst street food vendors in Owerri, Nigeria [21]. Studies done over a decade ago in Asia however found men to be more dominant in this industry [19]. A study in Nairobi, Kenya also found males to be about 60% of street vendor population which was is inconsistent with our findings [20].

Majority of the food vendors where in the age group of 20-29 years whiles the least were found in the over 50 year's age group (table 1). This finding is similar to that of other studies in Africa [5, 18, 20].

In this study, majority (38.5%) of the population had junior secondary school education as opposed to two previous studies in Ghana which found those with senior secondary school education to be the majority [5, 18]. About 33% of the respondents were illiterates as shown in table 1. This was found to be consistent with those of other studies [17, 18]. On the other hand, some studies found a high literacy rate amongst street vendors a finding inconsistent with that of this study [5, 21].

Table 1. Demographic characteristics of street food vendors

Variable		Frequency (N=200)	Percentage
Age	10-19	23	11.5
	20-29	68	34.0
	30-39	51	25.5
	40-49	40	20.0
	≥50	18	9.0
Sex	Male	11	5.5
	Female	189	94.5
Educational status	No formal	66	33.0
	Primary	44	22.0
	Junior secondary	77	38.5
	Senior secondary	11	5.5
	Tertiary	2	1.0

3.2. Knowledge of Food Safety Practices

Knowledge of food safety practices amongst respondents was 100% with their source of information shown in table 2.

Table 2. Sources of information on food safety practices

Source of information	Frequency (N=200)
Health officials	133
Television	77
Radio	28
Others	33

NB. There were multiple responses

Both the FAO and WHO recommends that food vendors should undergo basic training in food safety and hygiene practices by relevant authorities before they are licensed [5]. In this study, approximately 67% (133) of the vendors as shown in table 2 had heard and received formal training on safety practices from health officials in the district. This

finding was similar to that of another Ghanaian study where 65% of vendors had received formal training in food hygiene and safety practices [5].

Majority (97.5%) of respondents in this study knew of food borne diseases with almost all of them acknowledging the importance hand washing and medical screening in preventing spread of diseases. This was however not the case in Sudan, as only 30% of respondents were aware of food borne illnesses [22].

Knowledge level concerning hand washing practices after some major activities is shown in table 3.

Table 3. Knowledge level of hand washing practices amongst food vendors

Activity	Number	Percentage
Visiting toilet	200	100
Counting money	193	96.5
Blowing nose	199	99.5
Before food service	198	99

3.3. Food Safety Practices

3.3.1. Personal Hygiene and Food Handling

Poor personal hygiene especially non washing of hands with soap has been found to be associated with the transmission of bacteria pathogens amongst street food vendors [23]. Although a large proportion of vendors said they washed their hands after some major activities as illustrated in table 4, about 13% of them do not do that with soap, a finding very similar to that of an earlier study in a poor resourced community of Ghana [17]. Those who did not wash their hands with soap thought it was not necessary to do that whiles others also feared that the smell of the soap will be transferred to the food.

Table 4. Hand washing practices amongst food vendors

Activity	Number	Percentage
Visiting toilet	200	100
Counting money	160	80
Blowing nose	198	99
Before food service	177	88.5

Hand washing practices were generally high in this study as compared to an earlier study in Ghana and another in Sudan where hand washing practices after visiting the toilet were each about 92% [17, 22]. As opposed to our study, in Naher Elneel State of Sudan, 50% of vendors washed their hands after touching money whiles 70% did so after blowing their nose [22]. Although knowledge levels on hand washing practices was high amongst vendors (table 3), this high knowledge level was not entirely translated into practice as shown in table 4.

All the respondents said they washed their raw food stuffs thoroughly before cooking. However in Sudan, only 34% of vendors washed their food thoroughly before cooking [22]. Similarly in Kenya, food was either not washed at all or washed only once before cooking mainly due to insufficient water supply [20]. In Nigeria close to 70% of vendors said they washed their food before cooking. Covering of cooked food was highly practiced amongst vendors in this study as all of them said they covered their food. This was however inconsistent with that of Abdalla et al, 2009 in Sudan where they found out that 38% of food was sold uncovered [22].

Over the years, most of the vendors (57%) have mastered the art of cooking just about the right amounts of food in other to avoid wastage and storage challenges and therefore did not have any leftovers. However, 13% consumed leftover foods with family and friends with another 13% reheating it the next day without refrigeration. Close to 11.5% stored leftovers in refrigerators and 5.5% disposed off their leftovers. Other studies such as the ones in Sudan and Kenya showed higher (22% and 32% respectively) consumption of leftover foods at home as compared this study [20, 22]. The percentage of food stored in refrigerated form in our study was low as compared to that of other studies: 44% previously in Ghana [18], 63% in India [24], 21% in Kenya [20] and 33% in Nigeria [21]. Contrary to our finding, in Sudan only 2% of food vendors refrigerated their leftovers of food for reheating the next day [22]. In this Sudanese study however, 30% of the vendors threw their leftovers away as compared to the 5.5% in this study. A previous Ghanaian study showed a much higher percentage (12%) of food being thrown away [18].

The WHO and FAO both recommend that food handlers should be medically examined if clinically and epidemiologically indicated. This is meant to prevent the transmission of communicable diseases amongst food handlers and consumers [5]. The regulatory authorities in Ghana recommend that food vendors be screened every six months to ensure the prevention of communicable diseases. In this study although 100% of the respondents opined the importance of medical screening, 71% had actually been screened out of which 64% where screened more than six months ago. Our finding was consistent with another Ghanaian study where they observed that 68% of respondents where medically examined [5].

3.3.2. Water for Food Handling

The main source of water for cooking was pipe borne (67%) while's borehole (29%) and well (4%) water accounted for the rest. In a study conducted in an urban slum of Ghana, 99% of the water used for food vendor activities was pipe borne [17]. In Sudan pipe borne water accounted for about 60% of water used for food activities [22]. Pipe borne water however accounted for about 39% of water used for cooking in rural India [24].

Water used for cooking and other activities by vendors was found to be stored in bowls (73.5%), buckets (15%), both bowls and buckets (4.5%) and some other containers such as gallons, drums and pots (7%). These same containers were found to be used for other activities such as washing of cups and plates (54.4%), bathing (8.8%), both washing and bathing (8.8%) and other purposes such as storage of food stuffs (28%).

4. Conclusions

Knowledge levels of food safety practices amongst street food vendors in this Northern rural setting was very high but however, this high knowledge was generally not translated into practice. We recommend that health officials, who serve as the major source of information on food safety issues to vendors, move beyond just educating and disseminating information to ensuring that food safety practices are adhered to. The regulatory authorities in the district should also enforce the laws on food safety practices.

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