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Food safety knowledge and practices of street food-vendors in Khartoum City

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Summary

A survey was carried out to determine food safety knowledge of street food vendors in Khartoum city between March and May, 2008. Data on demographics, food safety knowledge and practices was collected from 50 food vendors using 26- questions. A few vendors (4%) acquired the knowledge of food preparation by formal training and only 52% of the respondents had the annual medical health certificate to indicate that they have carried out the recommended physical and medical examination, extension education, quality control information and knowledge of regulation for approval, food sale and preparation practices. Volume (70%) and price (62%) were considered more than freshness when purchasing raw materials. Some of the food safety knowledge of the vendors could not be translated to practice due to the absence of basic facilities such as water and toilets at their vending sites. Training on hygiene and sanitation, and provision of basic infrastructures for the street food industry is recommended.

Introduction

Street-vended foods are defined as those foods prepared on the street and ready to eat, or prepared at home and consumed on the street without further preparation (Bryan et al., 1997). Street-vended foods include foods as diverse as meat, fish, fruits, vegetables, grains, cereals, frozen produce and beverages (World Health Organization – WHO- 1996).

Each year, millions of people worldwide suffer from food-borne diseases (WHO, 2000), and illness resulting from the consumption of contaminated food has become one of the most widespread public health problems in contemporary society (Notermans *et al.*, 1995).

Street foods, particularly in developing countries, have been reported to be contaminated by pathogenic bacteria (Arambolu *et al.*, 1993; Bryan *et al.*, 1988a, Bryan *et al.*,1988b, Bryan *et al.*, 1992; and Desenclos *et al.*, 1991).

There are increased interests worldwide on the importance of street food as part of a general concern for food security and health (Canet and N'Diaye, 1996). The incidence of food-borne diseases is rising in developing countries, as well as in the developed world (Redmond and Griffith, 2003).

Most handlers of street-vended foods in Africa, and the developing world at large, are largely ignorant of basic food safety issues. Consequently, street foods are commonly exposed to dangerous abuses, often at all stages of handling. The washing of hands, utensils, and dishes is often done in buckets or bowls (Patience *et al.*, 2002). The health risk posed by street foods in various countries is frequently due to poor sanitary practices during preparation and sale (Arambolu *et al.*, 1993; Bryan 1978; and Roberts, 1982). At the global level, a World Health Organization survey has shown that street foods constitute a significant part of the urban food supply of 74% of the countries reported. (WHO, 1996).

Since notification is not obligatory, therefore data on food borne infections and intoxications do not reflect the real situation (WHO, 2004).

The aim of this study was to investigate the actual level of food safety knowledge and relevant practices in food handling.

Materials and methods

Study population and sample collection: A survey to evaluate the food safety knowledge and practices of street food vendors within Khartoum city was carried out between March and April, 2008. For this study, a street food vendor is defined as anybody selling ready-to-eat foods and/or drinks in streets and public places within the area of study. Fifty food vendors operating in the major streets, open air market, schools, offices and the general hospitals were recruited for the study. The written questionnaire used in this study was a modified version of a questionnaire from the US Food and Drug Administration (FDA) about food safety, nutrition, and cosmetics (FDA, 2003).

Structured questionnaire was developed to collect data from street food vendors. The questionnaire was pre tested for clarity and validity on 10 randomly selected street food vendors in open air market area in Khartoum city .Results of the pre-test were used in the revision of the initial survey questionnaire. The final version of the questionnaire contained 26 questions which were used to collect data from 50 street vendors on, health and personal hygiene knowledge of vendors (hand washing, bathing, food handling, and related ailments); food hygiene and knowledge of food borne diseases. Consent was obtained from respondents for the interview affirming that the data would be treated confidentially.

Statistical analysis: All statistical analyses were done using SPSS for Windows (version 11.0, 2001, Chicago, IL). Frequencies were computed for all variables.

Results

Socio-economic and demographic data including sex, age, marital status and educational level of the respondents are presented in Table 1. The respondents were 50% females and 50% males respectively with 38% in the 21–30 years age group and 8% were less than 20 years of age. Only 44% of respondents had no formal education while 46% had at least primary school education. Fifty percent of the street food vendors were

married while 44% were singled. Sixty six percent of the vendors surveyed were stationary and 34 % were mobile. Only 52% of the respondents had the health certificate to indicate that they had carried out the annual medical check up while 48% could not present the health certificate. Few (4%) of the vendors acquired their knowledge of food preparation by formal training while the majority of them acquired the knowledge through observation. Seventy six percent of the respondents had been in the food vending trade for less than five years.

Table 2 shows the various types of street foods vended within Khartoum city. The street foods were processed foods and vendor-prepared foods, such as soups and sauces snacks, drinks and bottled water. Majority of the stationary food vendors sell almost all categories of food while the mobile food vendors were restricted to one or two category of foods.

Health and hygienic practices of the street food vendors surveyed are expressed in Table 3 and Table 4. About 73% of the vendors had no knowledge of the need to wash hands after handling money, very few (14%) of the vendors were aware that it was necessary to wash their hands even when handkerchief is used for sneezing

Less than 46% of the respondents felt that the use of soap is not always necessary for hand washing but 86% said that they used clean water when washing their hands. Two percent of vendors responded that clean towel or disinfecting solutions were needed in hand washing, respectively (Table 4). Results on the reasons for hand washing showed that most vendors (70%) did not see the need to wash hand after scratching or after continuous handling of food; however, majority agreed that washing of hands after eating and after using the toilets is important.

About 10% of vendors agreed that sore eyes and stomach cramps are enough reasons to make them stop vending or cooking temporarily.

Results on the survey on good hygienic practices by vendors showed that more vendors considered the volume (70%) and the price (62%) than the freshness when buying food to be cooked or vended. Many vendors (44%) cooked the food on the morning of the sale day and only 42% reheated the food before sale. Over 54% of the respondents agreed on thorough washing of the food before cooking and adequate cooking of the food. Few (10%) vendors exposed their foods to flies, and the minority of 28% handled cooked food at ground level (Table 5).

Results on the knowledge exhibited by the food vendors on food borne diseases are presented in Table 6. Over 85% of food vendors were familiar with the term – "borne diseases" and 90% agreed that microorganisms can contaminate foods; however, few of the respondents believed that food colorings, flavorings and spices used in food preparation and preservation could contaminate food. Diarrhea and stomach pain were the most prevalent symptoms of food borne diseases identified, followed by vomiting, nausea, and headache. Many of the vendors are aware of some common food borne diseases and mode of transmission.

Discussion

The data presented show the health and hygienic practices of the street-vended in Khartoum city. The demographic profile of street food vendors obtained in this study is in contrast with the findings of Muinde and Kuri (2005) who reported that 60% of the vendors surveyed in Nairobi were males while only 40% were females. Most of the vendors in this study were less than 30 years old with 46% primary school education; this finding is in contrast with Klontz *et al.* (1995) who reported that females of at least 40 years old and with at least high school education prepared food in the United Sates. In this investigation the vendors (73%) had knowledge of need to wash hands after some activities; however, this knowledge is not translated to practice by the surveyed street food vendors. This may be attributed to the fact that water and hand washing or toilet facilities are not readily available in most of the vending sites surveyed. This is in corroboration with the findings of Idowu and Rowland (2006), but are in contrast with study conducted by Azanza *et al* (2005) who reported that the relatively high level of knowledge in hand washing and its translation to practice of surveyed street food vendors was due to the availability of a number of hand washing facilities. The food vendors (86%) in this survey were using tap water and may be they considered soap as an additional cost and this is in disagreement with WHO (1984) requirements for effective hand wash,. however, many of the vendors (60%) were found to have touched food with their bare hands and handled money while serving food. All these violations compromise the food safety of the vendor prepared food (Anon, 1999., Bryan *et al.*, 2003). Also, some of the vendors (10%) were wearing hair restraints and aprons when vending and some of them (9%) were considered wearing hands and arm jewelries the source of contamination (WHO, 1996). Only 52% of the respondents in this study have acquired medical certificates. This result is in contrast with Musa and Akande (2002), who reported that periodic medical examination and health certificates must be obtained from the authorized health centers and hospitals. Also the respondents (90%) have knowledge that microorganism can contaminate foods (Abdussalam and Kaferstein, 1993., and Omemu et al., 2005). Seventy percent of the vendors cooked the food and store it several hours before sale and only 42% reheated the food before sale. The preparation of food before its consumption for long time, storage at ambient temperature or inadequate cooling and reheating contributed to food poisoning outbreaks (Roberts, 1982; WHO 1989; Abdalla *et al.*, 2008).

We can conclude that, food vendors should be adequately educated on the role of food in disease transmission as well as on rules of personal hygiene and approved practices in handling street food. The legal implications of selling un-safety food should be made clear to street food vendors. Apart from this, there is need for the government to make available basic infrastructures for the society. These include supplies of portable water, electricity, waste disposal services, good drainage system and public toilets.

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Table 1. Profile of street food vendors studied in Khartoum (n = 50)

Parameter	Frequency	%
Age		
<20	4	8
21–30	19	38
31–40	13	26
>40	14	28
Sex		
Male	25	50
Female	25	50
Educational attainment		
No schooling	22	44
Primary school	9	18
Secondary school	15	30
Diploma	4	8
Marital status		
Married	25	50
Single	22	44
Separated	3	6
Types of vendors		
Mobile	17	34
Stationary	33	66
Health certificate		
With	26	52
Without	24	48
Length of time spent vending (year)		
<5	38	76
6-10	8	16
11- 20	2	4
>20	2	4
Acquisition of knowledge of food preparation		
Through observation	44	88
formal	2	4
Others	4	8

Table 2. Street foods vended within Khartoum ($n = 50$)

Type	Frequency	%
Soup (vegetable soup, plain soup, etc.)	9	13.6
Porridge	14	21.2
bread	1	1.5
Bean	11	16.7
Snacks	6	9.1
Bottled soft drink	3	4.5
juice	14	21.1
Meat (chicken and beef)	8	12.1

Table 3. Health and personal hygiene knowledge of street food vendors in Khartoum (%, n = 50)

Topics	Yes	No	No knowledge
Hand washing is necessary for street food vendors			
after touching money	31	18	1
even when handkerchief is used for sneezing	14	35	1
even when hands are not yet visibly dirty during continuous food handling	17	30	3
Street food vendors should			
bathe regularly	42	3	5
wear hair restraints and aprons when vending	33	7	10
consider hands and arm jewelries as sources of contaminations	7	34	9
Street food vendors can not safely handle food			
when they have cold, cough and catarrh	7	37	6
when sick with diarrhea even if hands are washed after trip to the toilet	7	34	9
when they have an open wound in the hands even if it is fully bandaged	10	35	5
when handling money	6	32	12

Table 4. Health and personal hygiene practices of street food vendors in Khartoum (n = 50)

Topics	Number of positive responses	%
1. Ailments that temporarily prevented vendors from vending or cooking foods		
Cough and colds	8	16
Diarrhea	11	22
Nausea	10	20
Vomiting	5	10
Sore eyes	5	10
Stomach cramps	6	12
Sick member of family	5	10
2. Hand washing requirements		
Clean water	43	86
Soap	24	54
Clean hand towel	27	54
Disinfecting solution	2	4
3. Reasons for hand washing		
Touching money	10	20
Handling garbage	10	20
Blowing of nose	14	28
After eating meals	43	86
After using the toilets	45	90
Handling raw foods	35	70
Scratching	15	30
Continuous food handling	15	30

Table 5. Knowledge of food-handling practices of street food vendors in Khartoum (n = 50)

Parameter	*n*	%
Parameters considered in buying food to be cooked or vended		
Price	31	62
Freshness	38	72
Clean food	40	80
volume	35	70
Sold by reputable manufacturer/wholesaler	25	50
Sold by reputable manufacturer/wholesaler	31	62
2. Food handling practices		
Food cooked during sale	13	26
Food cooked on morning of sale	22	44
Food sold from tray with covering	23	46
Food sold from tray with no covering	26	52
Food handled at ground level	14	28
Food exposed to flies	5	10
Food reheated before sale	21	42
Adequate cooking of food	29	56
Thorough washing of food to be cooked	13	26
Use of safe water for cooking	22	44
3. Serving of food		
Food served with fork/spoon	4	8
Food served with bare hands	30	60
Food served into cup/plate	13	26
4. Left-over food management used		
Throw away	19	38
Eaten at home	19	38
Refrigerated and reheated	4	8
No answer/no left-over	26	52
5. Source of water for hand washing and cooking		
Tap	47	94
6. Methods used in cleaning utensils		
Washing with soap and water	47	94
Washing with hot water	7	14
Drying with cloths	16	32

n = number of positive response.

Table 6. Food contamination knowledge exhibited by street food vendors in Khartoum (n = 50)

Topics	*n*	%
1. Familiarity with the term food – borne illness	5	10
2. Types of food contaminants include		
worms and parasites	13	26
splinters of wood and shards of glass	21	42
invisible germs in foods	34	68
Kerosene oil, detergent, or other similar products	12	24
Food colouring, flavouring and spices	6	12
Insects, insect droppings and dirt	8	16
3. Symptoms of food borne illness...		
Stomach pain	44	88
Diarrhoea	39	78
Vomiting	37	74
Nausea	31	62
Headache	9	18
4. Types of food borne illness		
Typhoid. . . from contaminated water	41	82
Cholera from contaminated water	32	64
Dysenteryfrom contaminated food and water	45	90

n = number of positive response.