

Assessment of Knowledge, Attitudes and Practices of Street Vendors in Mangaung Metro South Africa

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Abstract—Microbial contamination of ready-to-eat foods and beverages sold by street vendors has become an important public health issue. In developing countries including South Africa, health risks related to such kinds of foods are thought to be common. Thus, this study assessed knowledge, attitude and practices of street food vendors. Street vendors in the city of Mangaung Metro were investigated in order to assess their knowledge, attitudes and handling practices. A semi-structured questionnaire and checklist were used in interviews to determine the status of the vending sites and associated food-handling practices. Data was collected by means of a face-to-face interview. The majority of respondents were black females. Hundred percent (100%) of the participants did not have any food safety training. However, street vendors showed a positive attitude towards food safety. Despite the positive attitude, vendors showed some non-compliance when it comes to handling food. During the survey, it was also observed that the vending stalls lack basic infrastructures like toilets and potable water that is currently a major problem. This study indicates a need for improvements in the environmental conditions at these sites to prevent foodborne diseases. Moreover, based on the results observed food safety and food hygiene training or workshops for street vendors are highly recommended.

Keywords—Food hygiene, foodborne illnesses, food safety, street foods.

I. INTRODUCTION

STREET food means the food available in a public place, such as from a vendor on a street [1]. Typically, street food is tasty, ready-to-eat food or drink sold on the street, in a market, fair, park or other public place. A hawker or vendor sells it from a portable stall, cart or food truck [1]. This industry plays an important role in meeting the food requirements of urban dwellers in many cities and towns of developing countries. It feeds millions of people daily with a wide variety of foods that are relatively cheap and easily accessible [2]. In many streets of developing countries, like South Africa, the sale and consumption of ready-to-eat foods and beverages are a common and normal phenomenon of everyday life [3].

Street food vending assures food security for low-income urban populations and provides a livelihood for many workers who would otherwise be unable to establish a business. The benefits of this trade extend throughout the local economy as

often vendors buy their ingredients locally [4]. Various projects have shown that street food trade generates a large volume of business, involving large amounts of money and provides a competitive source of employment and income to millions of people [4]. As pointed out in a Bulletin of the [5], the patronage of street food is familiar in many countries where unemployment level is high, salaries are low, work opportunities and social programmes are limited, and where urbanisation is taking place. It is further stated that the street food vendors benefit from a positive cash flow, often evade taxation, as well as determine their own working hours [6].

II. METHODOLOGY

A. Setting

The survey was conducted in Mangaung Metropolitan Municipality. During the survey, a total of 15 street vendors were interviewed in Bloemfontein, Botshabelo and Thabanchu. The municipality was notified before the study was carried out. The attempt to get the overall number of street vendors in Mangaung Metro was in vain. The Environmental Health Practitioners at the Mangaung Metro stated that they do not have any database where the records of street vendors are kept. They also pointed out that they do not get to visit the street vendors as frequently as they should because of their tight schedules and sometimes because of the lack of resources.

B. Questionnaire

A structured questionnaire survey for food handlers was used in the study. The focus areas of the problems dealt within the questionnaire survey were demographic characteristics of food vendors, food safety and hygiene knowledge of street vendors, waste management around the stalls by the vendors and availability of washing facilities and potable water around the vending stalls. In addition, the questionnaire had a choice of three possible answers (Yes and No) and open-ended questions were asked to get more information from the vendors. In addition, a checklist was used to assess the food safety practices of street foods vendors such as keeping long nails, wearing jewellery, hand washing, hair covering, wearing protective clothes, etc. The checklist was also used to observe the environment around the vending stalls and lastly to obtain information on facilities; for example, availability of potable water and toilets as well as adequate washing facilities. Moreover, street vendors were provided with consent forms to sign before the interview. These consent forms were translated into a preferred language to the participants. Thereafter, it was explained to them that participation in the study is voluntary

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and that names and personal details of the participants will not be revealed, all the documentation and information obtained during the study will be kept confidential. It was further explained to them that participants have the right to withdraw at any time without providing a reason. Data was collected by means of a face-to-face interview. All questions were designed in English but translated into the language the respondents were comfortable with (which was Sesotho).

III. RESULTS AND DISCUSSION

Based on the results, Table I indicate that majority of street vendors in Mangaung Metro were females. For example, seventy-five (75%) of the surveyed vendors were found to be women, while men were only twenty-five (25%). It was also observed at most of the stalls that men were the owners of the stalls and females were only assisting with preparation and serving of foods. Generally, men do not like cooking, so women are left to take care of it [7]. The high percentage of women could be because women are better at selling this way since they do not mind approaching people to make a sale and are therefore more likely to carry out this trade. The results also indicate that no vendors (100%) had any food safety training. This is alarming based on food contamination. To prevent street food contamination, the regulation governing general hygiene requirements for food premises and transport of food [8] states that, any person working on the food premises must be adequately trained in food hygiene by an inspector or any suitable person. Moreover, according to Regulations Governing General Hygiene Requirements for Food Premises and the Transport of Food, GNR. 918 of (1999), Environmental Health Practitioners (EHPs) are mandated to carry out an inspection at all food vending around the stalls in South Africa [4]. If the EHP, after having carried out an inspection, is satisfied that the food premises concerned, having due regard to existing conditions of the adjacent land and facilities are favourable, the local authority shall issue a certificate of acceptability. This certificate shall expire permanently if the provision of sub regulation is not complied with.

TABLE I
 DEMOGRAPHIC CHARACTERISTICS OF VENDORS

Characteristics	Demographic characteristics	Frequency (percentages)
Gender	Female	75%
	Male	25%
Preferred language	English	0%
	Sesotho	100%
Training course	Yes	0%
	No	100%

From the results obtained in the study, the vendors also mentioned that the EHPs last inspected their stalls few years ago. This is of concern because the stalls at which the street vendors are selling food are not conducive. The stalls are not properly covered; they are exposed to dust, car smokes and insects. Dust has potential to carry many microbes that may be pathogenic if left to settle on prepared foods. Hence, it is important that food be covered to protect it from such exposure [9]. It is therefore important for the EHPs to monitor

the stalls as regularly as possible to ensure that they are in the conditions that are conducive for both vendors and consumers.

TABLE II
 ASSESSMENT OF VENDORS 'FOOD SAFETY KNOWLEDGE RESPONSE

Statement No	No	Yes
1. It is important to wash your hands before handling food	100%	0%
2. It is important to wear protective clothes while cooking	100%	0%
3. Knives and cutting boards should be properly sanitized to prevent cross contamination	100%	0%
4. Raw and cooked foods should be stored separately to reduce the risk of food contamination	100%	0%
5. Do you have storage facilities (refrigerator) for both raw and cooked meat	100% (cooler boxes)	0%
6. Do you know the correct temperature for the refrigerator	99% (cooler boxes)	1%
7. Do you reheat your food before serving	0%	100%
8. Food prepared in advance reduces the risk of food contamination	0%	100%
9. Dish towels can be a source of food contamination	100%	0%

TABLE III
 FOOD HANDLING PRACTICES OBSERVATIONS

Observation	Yes	No
1. Food prepared at the stall	100%	0%
2. Wash hands with soap before cooking	100%	0%
3. Wash food before cooking	100%	0%
4. Preparation surface clean	2%	98%
5. Prepared on same surfaces more than twice	98%	2%
6. Use of Apron	60%	40%
7. Long nails	1%	99%
8. Wears jewellery	2%	98%
9. Handles food with bare hands	100%	0%
10. The vendor's clothes are clean	99%	1%
11. Hair covering	99%	1%

Responses regarding the knowledge of food safety are shown on Table II. The street vendors all agreed that it is important to wash hands before handling food. During the observations shown on Table III, the vendors did indeed wash their hands with soap before handling food. However, 100% of the vendors surveyed handled food with bare hands. This practice might cause cross contamination between raw and cooked products. Hands are the most significant source of transfer for microorganisms from faeces, face, skin, or other sites to vendors [10]. The vendors can be carriers of pathogens like *E. coli*, *Salmonella*, *Shigella*, *Campylobacter* and *S. aureus* who eventually transfer these foodborne hazards to the consumers [10]. Therefore, it is prudent that cooked food should not be handled with bare hands. Moreover, all vendors (100%) in Table II stated that they kept their raw meat in the cooler boxes (Fig. 1) which is separate from the cooked food. This observation is complaint with essential safety requirements for street vended foods [11], [12] which states that an important principle in preparing and processing food is to avoid direct and indirect contact between raw and cooked or prepared foods that will be consumed without further heating. This practice by the street vendors reduces cross contamination. During the survey, only one vendor has a refrigerator for food storage. However, the vendor indicated

that she did not know the correct temperature for to keep food, which is a great concern in food safety, and food hygiene practices. On the other hand, vendors (100%) in Table II seemed to not be aware of the importance of reheating food to fight against foodborne diseases. If reheating is inadequate, bacterial contaminants can multiply. It was also observed that street vendors know the correct temperature to store their raw materials, they kept them in cooler boxes with ice inside (Table III). Based on observations at Table III, the current study shows responses from food handlers that found that 99% of street vendors showed compliance legislation by not wearing any jewellery and keeping their nails short and clean when preparing food. However, 40% of vendors showed non-compliance concerning wearing aprons during food preparation and serving. Food handlers should wear clean and proper clothing according to prevailing local standards. However, the requirement for them to wear aprons of a colour or shade or to wear hair coverings should be tempered by the realisation that has more to do with food aesthetics and inspiring consumer confidence than food safety [12]. Only 60% of the vendors wore apron while handling, preparing and serving food (Table III). The 60% of vendors wearing aprons and head coverings were mostly women; this may be due to a cultural norm or value that requires food to be handled with an apron and head covering [4]. Additionally, head coverings may be because of certain cultural requirements requiring the heads of married women to be covered.



Fig. 1 Cooler box used to store raw food during food preparation by street vendors

Due to lack of space, 98% showed non-compliance about food handling. They prepared foods on the same surface several times (Table III). In Fig. 2, it can be seen that surfaces were visibly not clean. It was also observed that these surfaces had remains of food prepared earlier, which can become sources of cross contamination. Again, an observation showed that food handlers did not sanitise working surfaces before and after food preparation (Fig. 2). Therefore, on this aspect educational training for food handlers is needed to ensure proper cleaning and sanitising of working surfaces to ensure minimal likelihood of contamination of food products prepared for consumers.

According to the results at Table IV, disposal of garbage

was seen to be one of the biggest problems at the selling points in Bloemfontein. Not all vendors (100%) in Table IV, had trash bins, instead they use plastic bags and boxes as trash bins. Street Vendors Laws and Legal issues in South Africa [13] indicated that one of the challenges identified are insufficient services such as waste bins. This causes concern as it might attract flies and insects that are potential vectors of pathogens. However, during the observations at the time of sample collection (Table IV) no flies, cockroaches and other vectors were visible around the stalls. These structures of vending stalls do not provide protection from the sun and dust and further investigation must be conducted regarding these concerns. This was also observed in the current study, were the vendors stated they are affected by rain during rainy seasons as their stalls are open and cannot protect them from the rain.



Fig. 2 Preparation surface of street vendors before and during food preparation

TABLE IV
 ENVIRONMENT AROUND THE STALLS

Observation	Yes	No
1. Trash bins available for customer use—they use plastic bags	100%	0%
2. Enough trash bins available for disposal of solid wastes	0%	100%
3. The environment around the stall is clean: far from rubbish	99%	1%
4. Presence of vectors e.g. cockroaches, rodents, around the stall	0%	100%
5. Stalls are located far from toilet facilities	100%	0%
6. Vending stall protected from sun, wind and dust	0%	100%
7. Location of the business interfere with human or traffic flow	0%	100%

TABLE V
 ASSESSMENT OF ENVIRONMENT AROUND THE STALLS RESPONSE

Statement	Yes	No
1. Are dustbins available for customers use?	0%	100%
2. Do you have a drainage system available for disposal liquid wastes?	70%	30%
3. Do you have your own waste bin or do you share it with other vendors?	100% (plastic bags)	0%
4. Do you experience problem of waste disposal during strikes by waste collectors?	100%	0%

In this questionnaire survey, 70% of the food vendors indicated that they had water drainage systems near their vending stalls, even though some of these drainages were

blocked and smelly encouraging fly and mosquito breeding (Table V). Therefore, Mangaung metro should ensure that their waste and wastewater drainages are managed properly and regularly. During the current study 30% of surveyed vendors stated that they must walk a distance to reach the drainage systems, they therefore keep the dirty water in the extra containers the whole day until the close of business when they find time to discard the water in the drainages. This is a course of concern because keeping dirty water around the stall is unhygienic and may harbour pathogens. A number of vendors expressed concern about the non-functionality of drains that make some customers complain about the safety of food they buy daily. Furthermore, the results of the survey in Table VI indicate that there is no potable water supply near the vending stalls in Mangaung. It was found that 99% of the food vendors surveyed obtain water from the nearby stores. Vendors buy water for R3.00 per 20 litres every day. In addition, [14] conducted a study in Bloemfontein and reported that street vendors had limited access to potable water and had various means of obtaining water such as nearby shops or bringing the water with them from home. Based on these results, this suggest that no improvements have been made with regards to availability of lack of potable water since the study was done in 2006.

TABLE VI
 WATER AVAILABILITY AROUND THE STALLS

Observation	Yes	No
1. Source of water at the stall/nearby	1%	99%
2. Drainage for disposal of waste water at the stall/nearby	70%	30%
3. Hand washing facilities available nearby	1%	99%
4. Water stored in clean containers	100%	0%
5. Water reused more than twice	100%	0%

The absence of water points near their work places and poor drainage facilities make them unable to practice good hygiene. In this study, the vendors also revealed that in attempts of cutting costs, they buy limited quantities of water and hence have insufficient water for washing their crockery and foodstuff. As a result, food vendors reuse their washing utensils water more than twice that is unacceptable according to Regulations Governing General Hygiene Requirements for Food Premises and the Transport of Food, GNR. 918 of (1999) [15]. In addition, all the vendors stated that they only change the dishwashing water as soon as the water changes colour. This practice compromises hygiene, because they believe that clean water can be determined through observation that is not true [16]. This perception by food handlers that clean water can be easily identified with a naked eye is a concern and may need to be further explored in order to determine whether this is due to the proximity of tapped drinkable (potable) water in this study area or misconception about microbes.

Concerning storage, vendors mentioned that they do not have enough storage for the utensils and equipment. During operation hours, they store their utensils (pots, cutlery, dishes, etc.) in small table (Fig. 3). Because of lack of storage space, they keep their equipment (chairs, tables, tents) in the storage

rooms of the nearby stores. The owners of the store charge them an amount of R20 per day. Depending on how much equipment (chairs, tables, tents) they have, they might even pay more than that anticipated amount. They travel with their utensils every morning when they come to work and carry them home at the end of the day. Because of the lack of storage, they end up buying less stock so that they can take leftovers home and bring back the next day. Moreover, only 5% of interviewed street vendors reported that they pay monthly rent to the local municipality. However, despite their contribution towards stall rental fees, the current results have indicated that their stalls lack shelter, running water, toilets and infrastructure for waste management. These deficits make it difficult for their businesses to compete with the nearby stores. Furthermore, the respondents indicated that they believe their rent payments were not used to provide any services or infrastructure towards improving their circumstances. Mangaung Local Municipality by-laws relating to street trading [17] stipulates that all street trading sites are leased to the street traders at a fee as determined by the Council from time to time. Street Vendors' Laws and Legal Issues in South Africa [13] also states that municipality may charge an annual rental fee. However, it is not clear in the legislation what this fee should be used for.



Fig. 3 Vendors keep their utensils on a small table during business hours

IV. CONCLUSION

Their attitude towards food safety was positive, although some of the actual food handling practices by street vendors raises some serious concerns. Despite the vendors' positive attitude towards food safety, non-compliances were observed; some of the vendors did not wash hands and did not wear aprons during processing and serving of food. From this observation, it can be concluded that the vendors need trainings on food safety and hygiene. It is therefore, recommended that food handlers undergo training and attend educational workshops to ensure that they follow the required rules for proper hygiene and sanitation. In addition, authorities

must implement policies aimed at assisting, controlling and maintaining the street food sector to ensure the safety of street vended food. It was observed that the material used for the construction of the stalls was not able to protect the food from dust, given that all the stalls was built on the roadsides, which were dusty and prone to smoke from cars. Moreover, storage was found to be a big problem for street vendors when the survey was done. The local government should consider establishment of street food Centre with adequate facilities and utility services. Centres that will provide the necessary utilities such as potable water, adequate light, and drainage and solid and water disposal, creating conducive environment for consumers to be served with safe food and provide good setting for the relevant authorities to conduct information, education and training programs for vendors. Moreover, street vendors stated that they would also like to have access to electricity since this would be a lot cheaper than buying gas every week and charcoal daily. It should be taken into account that street vendors pay monthly rental to the municipality despite the lack of facilities.

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