



Food Safety Practices and Population Perception Regarding Street Food Vendors in Hyderabad, Pakistan

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Abstract: The study was conducted in district Hyderabad, Sindh, Pakistan and for this two sets of questionnaires were developed each for food vendors (40) and population using street foods (40). All respondents were randomly selected and interviewed. The study revealed that all the vendors were male (100 %). Among the vendors, 95% were literate (at least primary education) and 50% were ≤ 30 years. Food safety related training was not received by any vendor in study area. A significant majority of vendors did not know about good handling practices (GHP) and good manufacturing practices (GMP) i.e. 52.5 and 45%, respectively, while an overwhelming majority (80%) was familiar to food borne illnesses (FBIs). Most vending carts were in poor hygienic condition (72.5%), infested with flies (97.5%) and only 32.5 % vendors were in clean clothes. Some vendors experienced infectious diseases like, hepatitis (5%) and tuberculosis (7.5%). In case of population using street vended foods, only 5% were satisfied with hygienic condition of food vendors, quality of raw material (10%), serving utensils (7.5%) and food freshness and purity (15%), therefore, significant majority (87.5%) of population using street foods experienced FBIs. Meanwhile, main reasons for consuming street food were low food cost (90%), ease (85%) and palatability (75%). Significant associations ($p < 0.05$) were observed between vendors' demographics (age and education) and their vending practices, while highly significant associations ($p < 0.05$) were recorded between street food users' education and perceptions. In vendors' self-reported analysis, average value for vendors' knowledge remained 7.75, vendors' attitude stayed 23.18, while average value for vendors' food safety practices was recorded as 6.51. Study concludes that vendors' food safety knowledge and practices are poor, therefore, population using street foods are not seemed satisfied with safety measures in street food vending.

Keywords: Food Borne Illnesses; Food Safety Practices; Street Food Vending; Vendors

1. **INTRODUCTION**

Foods or beverages that are prepared/sold by the vendors in streets and other public areas for an immediate/late consumption without further processing are termed as street vended foods (Von and Makhoane, 2006). This food is easily available, less expensive, nutritious (Badrie *et al.*, 2005) and source of income generation for the vendors. The street food vending is a rapidly emerging business sector in Pakistan. It is not merely meeting food demands of dwellers but is also a crucial source of employment in almost all parts of the country. According to Aluh and Aluh (2017), about 40% of urban population in developing countries consumes street foods.

Food safety assurance is a major limiting factor in street foods against FBIs. Generally, street foods are improperly handled, prepared and sold. These foods are often contaminated/cross contaminated during processing which causes FBIs (Alimi, 2016). It is estimated that most vendors have very little or no formal education and it makes them unable to follow good handling and manufacturing practices (Nurudeen *et al.*, 2014). The awful practices by untrained food vendors are mostly outside the governmental regulation (Alimi, 2016). It is fact that food safety related trainings

Can improve handling and manufacturing practices of food vendors (FAO/WHO, 2002) as these trainings can assist vendors to reinforce effective food safety actions during food processing.

The population relying upon street food is vulnerable to FBIs owing to ingestion of unsafe vended food (WHO, 2008). The food vending sector is severely troubled with unwholesome activities which need serious actions for securing health (Muyanja *et al.*, 2011). Like other developing countries, there is no any legal framework offering food safety related trainings among the vendors in Pakistan. Food and Agriculture Organization (2006) and many other investigators revealed that population relying upon street foods belongs to informal sectors i.e. children, students, office workers, housewives (FAO, 2010), homeless people (Zain and Naing, 2002) and beggars etc. The trade of street food vending is rising day by day in Pakistan but food safety assurance seems unreliable in the country. Present study is therefore carried out to evaluate (i) vendors' knowledge & practices regarding food safety (ii) perception of population using street food regarding food safety (iii) vendors' self-reported food safety knowledge, attitude and practices in district Hyderabad, Sindh, Pakistan.

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2. METHODOLOGY

Study Area and focus group

The survey was conducted from street food vendors and population using street foods from the main public areas of district Hyderabad, Sindh, Pakistan during summer (March to September, 2017). The study area is sub-tropical with temperature 40 to 50°C during summer. (Fig. 1) shows the map location of district Hyderabad. The area was selected for study owing to (1) a rapid raise in food vending in area, (2) persistently increasing demand for vending food and (3) poor food safety practices by vendors.



Fig. 1 Map location of Hyderabad, Sindh, Pakistan
(Courtesy: Google Maps: <http://www.google.com/>
accessed on 17 Aug, 2018).

Data Collection

The study was comprises on three phases. The data for each phase was collected via using separate sets of structured questionnaires consisting of several distinctive sections.

Phase I: Forty(40) street food vendors were selected randomly and interviewed for (i) Demographics, (ii) Vendors' food safety trainings and knowledge of GHP, GMP and FBIs (iii) Health condition and habits of vendor while working, (iv) Vending cart sanitation

Phase II: Forty(40) individuals from street food using population were selected randomly and interviewed for (i) Demographics (ii) Level of satisfaction (iii) Reasons for using vended foods and outbreaks of FBIs

Phase III: For evaluating vendors' self-reported food safety knowledge, attitude and practices, all literate vendors (38 out of 40) who were able to read and write local language were asked to participate in survey. The vendors' food safety knowledge, attitude and practices were determined according to Rahman *et al.* (2012). For this reason, vendors were provided three sets of

questionnaires consisting of multiple choice questions. First set of questionnaire was consisting of 10 questions for evaluating food safety knowledge with choices "yes" or "no" and for summing the data mark "1" was given to "yes" and "0" to "no". The set of questionnaire for measuring attitude was consisting of 08 questions and for scoring them a 5-point (1-5) Liker scale was used i.e. 1= strongly disagree, 2= agree, 3= disagree, 4=strongly agree, 5=no response. Third set of questionnaire was based on 12 questions for examining vendors' practices with choices "never", "sometime" and "always" and for summing the data for practice mark "0" was given to "never", 1 to "sometime" and 2 to "always". All sets of questionnaires provided to vendors were in local language.

Data Analysis

The data collected from Phase I and II were analyzed using Statistical Package for Social Sciences (IBM SPSS Statistics 20). Percentage and frequencies were used to interpret the findings from the recovered data. Tables and graphs were drawn for better understanding of results. Chi-square test was performed for observing associations ($p \leq 0.05$) between (i) demographics & practices of vendor and (ii) demographics & perception of customer. However, the data recovered from phase III was sum-up to obtain average (SD=Standard Deviation), maximum and minimum values.

3. RESULTS

Phase I: Street food vendors

Demographics

The vendors' demographics (Table 1) shows that all vendors were male (100 %) of which 50 % were ≤ 30 years old and 75 % were married. Merely 5 % vendors were illiterate while others possessed education from primary to graduation level.

Table 1 Information regarding demographics among street food vendors ($n=40$)

Demographic variables	Percentage (%)	Frequency
Gender		
Male	100	40
Female	0.0	00
Age (years)		
≥ 50	20	08
30-50	30	12
≤ 30	50	20
Marital status		
Married	75	30
Unmarried	25	10
Education level		
Illiterate	5.0	02
Primary	32.5	13
Secondary	2.5	01
Matriculation	12.5	05
Intermediate	45	18
Graduate	2.5	01

Vendors' food safety trainings and knowledge of GHP, GMP and FBIs

The food safety trainings were not received by any vendor (100 %). Many of the vendors did not know about GHP (52.5 %) and GMP (45 %). It was noticeable that most vendors (80 %) were familiar with FBIs. About less than half of vendors (45 %) usually observe food staling and 55 % vendors were involved in selling leftovers (Fig. 2).

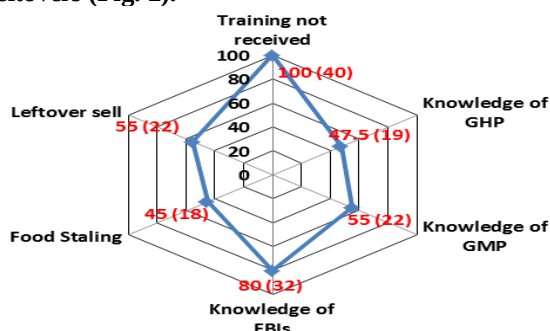


Fig. 2 Vendors' food safety trainings and knowledge of GHP, GMP and FBIs [% (frequency)]

Health condition and habits of vendor while working

The vendors' clothing were unsatisfactory, only 32.5 % vendors were wearing clean clothes, 40 % dirty and 27.5 % stained clothes. Many vendors were addicted to chewing (55 %), smoking (67.5 %) and talking (80 %) while working. About 7.5 % vendors were suffering from infectious disease like tuberculosis (2.5 %) and hepatitis (5 %), while 12.5 % experienced tuberculosis (7.5 %) and hepatitis (5 %) in past. More than half of the vendors (67.5 %) were exhibiting poor personal hygiene (Fig. 3).

Vending cart sanitation

In (Fig. 4) hygienic condition of vending cart is presented. Approximately, 72.5 % carts were in unhygienic condition, 97.5 % were infested with flies and 22.5 % with rodents. The unsheltered carts were 82.5 % while uncovered foods were 70%. Majority of vendors wash their cart (85 %) and cart area (90 %) on random basis and just 2.5 % vendors wash utensils with detergent while others (97.5 %) with water only. A few vendors (20 %) were preparing food at their home, 47.5 % at shop while rest of them (32.5 %) at street.

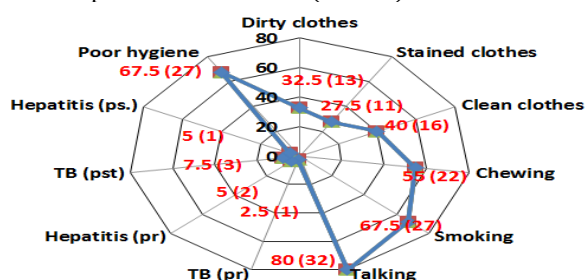


Fig. 3. Health condition and habits of vendor while working [% (frequency)]
(TB= Tuberculosis, pr.= Present, pst.= Past)

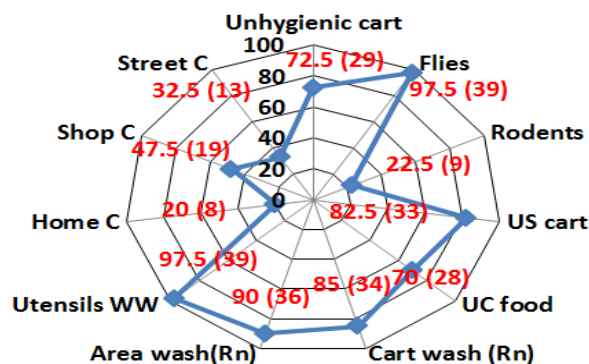


Fig. 4. Vending cart sanitation [% (frequency)]
(US= Unsheltered, UC= Uncovered, Rn= Random, WW= Water washing, C= Cooking)

Phase II: Population using street food

Demographics

The demographics of population using street food revealed that majority of them were male 72.5 %, 60 % were ≤ 30 years, while 70 % were married. Merely 10 % were illiterate while others were literate from primary to graduation level (Table 2).

Table 2 Information regarding demographics among the population using street food (n=40)

Demographic variables	Percentage (%)	Frequency
Gender		
Male	72.5	29
Female	27.5	11
Age (years)		
≥ 50	10	04
30-50	30	12
≤ 30	60	24
Marital status		
Married	70	28
Unmarried	30	12
Education level		
Illiterate	10	04
Primary	17.5	07
Secondary	22.5	09
Matriculation	17.5	07
Intermediate	27.5	11
Graduate	5	02

Level of satisfaction

Only 10 % individuals were satisfied with hygienic condition of vendor and 5 % with the hygienic condition of cart. The satisfaction for quality of raw material remained 7.5 %, 10 % individuals were satisfied with serving utensils and just 5 % with the food freshness with purity (Fig. 5).

Reasons for consuming vended foods and outbreaks of FBIs

(Fig. 6) reveals that individuals using street food prefer vended foods due to low food cost (90 %), ease (85 %) and palatability (95 %). Around 87.5 % of studied population experienced outbreak of FBIs upon ingesting street foods (Fig. 7).

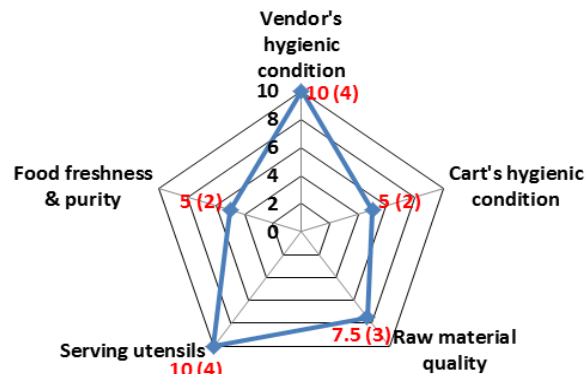


Fig. 5. Level of satisfaction [% (frequency)]

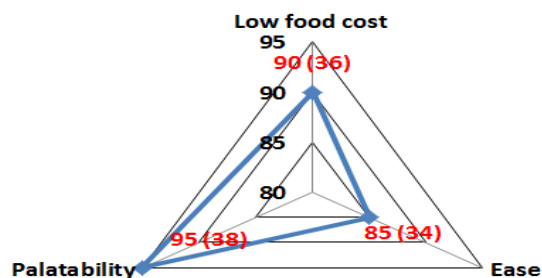


Fig. 6. Reasons for consuming vended foods [% (frequency)]

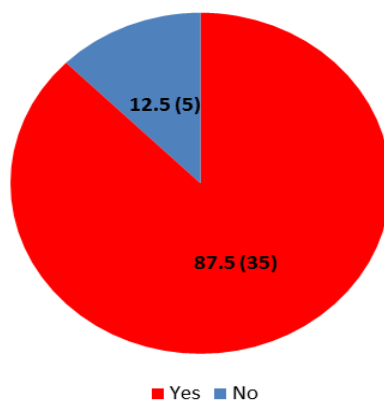


Fig. 7 Outbreak of FBIs experienced by individuals [% (frequency)]

Association test (Chi-square analysis)

Significant associations of vendors' practices

The significant associations ($p < 0.05$) were noticed between vendors' age and their vending practice i.e. selling leftovers as well as vendors' age and their knowledge of GHP, GMP and FBIs. It was noticed that vendors below 30 years were more aware to GHP, GMP and FBIs (Table 3). Moreover, highly significant associations ($p < 0.05$) were recorded between vendors' education level and their knowledge (i.e. GHP, GMP and FBIs) as well as vendors' education and their practices i.e. selling leftovers, vendors' clothing and personal hygiene (Table 4).

Significant associations of perceptions of population using street foods

The age of population using street foods showed non-significant associations ($p > 0.05$) with satisfaction to vendors' personal hygiene, cart hygiene, quantity of raw materials, serving utensils, food freshness and purity, low food cost, ease, palatability and outbreak of FBIs while highly significant associations ($p < 0.05$) were recorded between education level of population using street foods with hygienic condition of vendor and cart, quantity of raw materials, serving utensils, food freshness and purity (Table 5).

Table 3 Statistically significant ($P \leq 0.05$) associations between vendors' age and knowledge/vending practice(s)

Variables	Significance ($P \leq 0.05$)	Pearson's value
<i>Vendors' knowledge</i>		
GHP	0.008	9.724 ^a
GMP	0.010	9.192 ^a
FBIs	0.001	14.219 ^a
<i>Vendors' practice(s)</i>		
Selling leftover	0.002	12.256 ^a

Table 4 Statistically significant ($P \leq 0.05$) associations between vendors' Education and knowledge/vending practice(s)

Variables	Significance ($P \leq 0.05$)	Pearson's value
<i>Vendors' knowledge</i>		
GHP	0.000	28.059 ^a
GMP	0.000	31.336 ^a
FBIs	0.001	19.808 ^a
<i>Vendors' practice(s)</i>		
Selling leftover	0.000	25.051 ^a
Vendors' clothing	0.002	25.235 ^a
Personal hygiene	0.014	14.270 ^a

Table 5 Statistically significant ($P \leq 0.05$) associations between education level of individuals using street food and their perception(s)

Variable	Significance ($P \leq 0.05$)	Pearson's value
<i>Individuals' perceptions</i>		
Hygienic condition of vendor	0.000	40.000 ^a
Hygienic condition of cart	0.002	18.947 ^a
Quantity of raw materials	0.000	29.189 ^a
Serving utensils	0.000	40.000 ^a
Food freshness and purity	0.002	18.947 ^a

Phase- III

Vendors' food safety knowledge, attitude and practices

Average (SD) score for vendors' knowledge remained 7.75 (0.08). Vendors' attitude gave an average (SD) of 23.18 (5.86), however, average (SD) score for vendors' food safety practices was recorded as 6.51 (4.87) (Fig. 8).

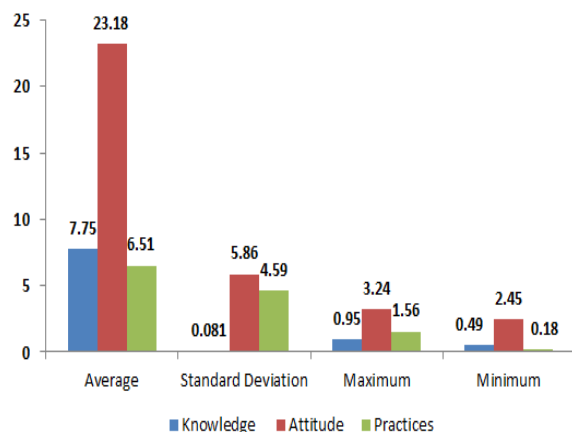


Fig. 8 Average (SD) scores for vendors' food safety knowledge, attitude and practices

4. DISCUSSION

Street food vending has a crucial role in meeting employment opportunities and supplying ready to eat foods in Pakistan. Unlike other countries, majority of vendors are male in Pakistan (Chukuezi, 2010; Webb and Morancie, 2015, Aluh and Aluh, 2017), one possible reason of male dominance is patriarchy culture, as in many Muslim countries man is head earner in a family rather than a woman. About half of the vendors were aged up to 30 years and many of them possessed education from primary to graduation. However, Sun *et al.* (2012) found that 75 % vendors aged 30 years, 86.7 % were married, 7.5% were without formal education and 43.3% of them were graduated in Tainan City, Taiwan.

Unsatisfactory food handling and manufacturing practices may contaminate foods and disseminate pathogens but regrettably some food vendors do not know about safe food handling and manufacturing practices (Cuprasittrut *et al.*, 2011; Nee and Norrakiah, 2011; Webb and Morancie, 2015). Food safety trainings can improve vending practices (FAO/WHO, 2002), therefore, food processors should be trained (Cohen *et al.*, 2001; Nel, *et al.*, 2004; Bas *et al.*, 2006; Roberts *et al.*, 2008 and Brannon *et al.*, 2009). Since, there is no any legal framework which offers food safety related trainings to food processors in Pakistan; therefore no any vendor received food safety related training in this study area. According to Khairuzzaman *et al.* (2014) many vendors are enthusiastic to participate in food safety trainings in order to receive valuable information regarding safe food processing. Furthermore, many vendors did not know about GHP and GMP while a noticeable majority of vendors were familiar with FBIs. When sell is declined due to less clientage food staling was also observed. The staled food is not suitable for consumption but still many vendors sell it, however, vending leftovers was also common among the vendors.

Present findings reflect that vendors' clothing was unsatisfactory and many vendors were addicted to chewing, smoking and talking. According to WHO (2008) and FAO (2011), a food processor should be medically examined in order to prevent chances of transmission of communicable diseases but still some vendors were suffering from infectious diseases and were exhibiting poor personal hygiene. Surprisingly, food vendors in Ghana knew the necessity of episodic clinical observations and therefore they routinely go for medical check-up (Monney and Owusu, 2013). Similarly, the Taiwan government restricts food handling by processors suffering from hepatitis (A), skin disorder and other transmittable infections (Food GHP, 2000).

Many carts were found in unhygienic condition with infestation of flies and rodents. The garbage around the cart provides harborage to insects, pests and rodents and this situation favors infestation of flies, mosquitoes and rodents in and around cart. A huge number of carts were unsheltered and vended foods were found uncovered. The washing of vending cart and cart area was common among the vendors on random basis; however, many vendors were washing utensils with water only rather than using detergent. For washing and cleaning of utensils, the USDA's Food Safety and Inspection Service (2013) recommend hot water, however, vendors mostly relying upon water rinse (Barro *et al.*, 2007). The lack of water resources around vending area (Sun *et al.*, 2012) coupled with improper cleaning and sanitation procedures during vending (Webb and Morancie, 2015) are among the major issues. Many vendors display their carts where insects are enormously present while most vendors prepare foods at vending premises rather than at home (Muyanja *et al.*, 2011).

According to present findings the majority of people using street food were male, aged up to 30 years and most of them were literate from primary to graduation level. In a similar study, (87 %) were male, 60 % were married, 2.1 % individuals using street foods were without formal education while remaining were literate in Oyo, South Western Nigeria (Leshi and Lsehi, 2017).

The individuals using street food seem hardly satisfied with hygienic condition of vendor and the cart. In these circumstances, it is distressful that vendors emphasize on quantity of raw material instead of quality (Aluh and Aluh, 2017). The individuals using street food prefer them due to low cost, ease and palatability. According to these individuals street foods are more appealing, cost effective and are readily available alternatives against homemade foods (Badrie *et al.*,

2005; Donkor *et al.*, 2009) therefore, street food consumption is common in countries where rate of unemployment is high coupled with low salary packages. Many individuals experienced outbreak of FBIs upon ingesting street foods and despite of this many individuals do not prioritize food safety before consumption (Surujlal and Badrie, 2004). However, significant associations were noticed between vendors' age and their vending practices i.e. selling leftovers and between vendors' age and knowledge of GHP, GMP and FBIs. The vendors with intermediate education were more acquainted towards GHP, GMP and FBIs while vendors with primary education were distinctly involved in selling leftovers and displaying bad personal hygiene. Majority of vendors with intermediate education were wearing dirty clothes despite knowing GHP, GMP and FBIs. Conversely, Monney *et al.* (2013) and Mwangi (2002) reported statistically non-significant associations between vendors' education level and safety practices. Both age and the education level of the vendors showed non-significant associations ($p > 0.05$) with practices such as vendors clothing, chewing, smoking, talking, personal hygiene and cart washing. In case of population using street vended food, many variables exhibited non-significant associations ($p > 0.05$) while highly significant associations were recorded between education level and perceptions of population using street food. Likewise, Franklyn and Badrie (2015) also recorded statistically non-significant association between individuals' education and consumption practices. The results for vendors' self-reported knowledge, attitude and practices regarding food safety revealed that all vendors acquainted insufficient food safety knowledge. Unexpectedly, they exhibited greater attitude while impaired food safety knowledge and practices.

5. CONCLUSION

Street food vending is an emerging business sector playing a crucial role against unemployment in the country and facilitating palatable, low cost and ready to eat food to the population. Regrettably, unsafe processing and selling practices, unsatisfied health conditions and habits of vendors during vending are associated with FBIs. Suppressing this entrepreneurship is not correct strategy to overcome associated problems since this is a valuable employment source for poor dwellers. To eliminate avoidable issues, attention should be paid to provide training sessions to vendors and for this governmental and non-governmental sectors should play their role. The extent of FBIs can be lessened by implementing GHPs, GMPs and by episodic clinical examination of vendors against transmittable diseases so that individuals' health can be assured. On the other side, consumer should also pay attention prior to consuming vended foods. They must prioritize hygienic

condition of vendor, vending cart and area in order to stay free of FBIs.

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