Microbial Quality, Nutritional Knowledge and Food Hygienic Practices Among Street Food Vendors

B,Gowri,

Research Scholar, Department of Home Science,

Gandhigram Rural University, Gandhigram, TamilNadu. India.

gowdietician@gmail.com

Dr.K.P.Vasantha Devi,

Professor and Head of the Department of Home Science

Gandhigram Rural University, Gandhigram, TamilNadu. India.

kpvasanthadevi@gmail.com

and

Dr.M.Sivakumar,
Assistant Professor of Economics,
Department of Economics,
Chikkaiah Naicker College, Erode-04.
TamilNadu. India
sivakumarmarimuthu@yahoo.co.in

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1. INTRODUCTION

The term “street foods” describes a wide range of ready-to-eat foods and beverages sold and some times prepared in public places, notably at streets. Like fast foods, the final preparation of street foods occurs when the customer orders the meal which can be consumed where it is purchased or taken away. Street foods and fast foods are low in cost when compared with restaurant meals and offer an attractive alternative to home-cooked food. In spite of these similarities, street food and fast food enterprises differ in variety, environment, marketing techniques and ownership.

Foods that are served to the customers should be “clean” and “safe”, absence of poisonous substances or contaminants and free from spoilage. If foods are not clean and safe health hazards like headache, stomach pain, vomiting, giddiness and anaemia may also occur. Due to the modernization many school children and adults skip their break fast and they prefer to eat street foods or fast foods or convenient foods.

There is mistaken assumption that food contamination is inevitable in street foods. Yet millions of people depend on this source of nutrition. Vendors knew that consumers watch the way food is prepared and notice whether the work area and vendor’s hands and cloths are clean or tidy. The vendors have to satisfy the customers with improved practices in the preparation of foods learned through training in nutrition and hygiene.

Since, all categories of people from different socio-economic sectors purchased the street foods; the street foods should not only be cheap but also hygienic and rich in nutrition. The investigators with their nutrition knowledge had an urge to study the

nutrition knowledge of the vendors, whether the foods prepared are nutritional sound or not? are they preparing and serving food hygienically? etc. Disease could be easily spread through food, water and the place of sales, how it is packed etc. and these questions made the investigators to take up this study. Hence, the investigators were interested to know the answers for the above said questions.

Hence, studying microbial quality, nutritional knowledge and food hygienic practices among street food vendors importance at this hour and this paper aims to analyze this.

2. METHODOLOGY

To study the nutritional knowledge and food hygienic practices prevailing among the street food vendors. 200 vendors in Dindigul district, Tamil Nadu, India were selected by using purposive random sampling techniques. The investigators met the vendors and collected the details. Microbial analysis, food adulteration test were done for food samples. Microbial load for the major street foods like bhajji, vada, samosa varieties, roasted corn etc., were tested. Raw materials used for the street foods were collected such as dhal, salt, sugar, oil, pepper, turmeric and chilly powder and there were analyzed for food adulteration.

3. RESULTS AND DISCUSSION

The socio-economic profile of the selected street food vendors were assessed by using the parameters such as age, sex, educational status and income of the subjects by interview method and the results obtained are discussed below

Table No.1: Age and Sex of the Respondents

Sl.No	Age (yrs)	N = 200					
		Male	**%**	**Female**	**%**	**Total**	**%**
1	20 - 30	49	24.5	8	4	57	28.5
2	31 – 40	50	25	3	1.5	53	26.5
3	41 – 50	27	13.5	23	11.5	50	25
4	51 – 60	20	10	20	10	40	20
	Total	146	73	54	27	200	100

Nearly 29 percent of the vendors were in the age range of 20-30 yrs. 26.5 per cent were in the age group of 31 – 40 years. 25 percent were in the age group of 41-50 years. Out of 200 respondents 146 were male and rest of the 54 were female in percentage those were 73 and 27 respectively. It is clear that males were more than females.

Table No.2: Family Background of the Street Food Vendors			
Sl.No	**Variables**	**N=200**	**%**
	I – Religion		
1	Hindu	135	67.5
2	Muslim	45	22.5
3	Christian	20	10
	II – Types of family		
4	Nuclear family	125	62.5
5	Joint family	75	37.5

This shows that 67.5 percent of the street food vendors were Hindus, 22.5 percent of them were Muslims and 10 percent of them were Christians. Among the selected street food vendors majority of them were Hindu. Nearly 63 percent of the respondents were from nuclear family and the rest were from joint family.

Table No.3: Monthly Income Range of the Selected Street Food Vendors			
Sl.No	**Monthly Income Range (in Rupees)**	**N=200**	**%**
1	Below 2000	31	15.5
2	2001 – 3500	64	32
3	3501 – 5000	59	29.5
4	Above 5001	46	23

The above table depicts that the monthly income range of the selected respondents. Around 32 percent of them had their income range of Rs. 2001 – 3500;

followed by 29.5 percent of them had between Rs. 3501 – 5000 and only 23 percent of them had above five thousand and 15.5 percent of them had below .Rs.2000 per/month. From this it is clear that all the selected respondents were belonged to low – income group where they may find it difficult for ends to meet.

Table No.4: Educational Status of the Respondents

Sl.No	Educational level	N=200	%
1	Illiterates	39	19.5
2	Primary level	40	20
3	Secondary level	59	29.5
4	Higher Secondary level	40	20
5	Graduates	22	11

The above table gives the educational status of the selected respondents. Nearly 30 percent of them had their education up to secondary school level; followed by 20 percent of them had higher secondary level, 20 percent of them had education up to primary level and 11 percent of them were graduates. About 19.5 percent of them were illiterates.

Table No.5: Details regarding Food Hygiene and Sanitation							
Sl.No	**Items**	**Used**	**Not used**	**Appearance**		**Covered**	**Un covered**
				Cleaned	**Dirty**		
1	Serving Utensils	142(71%)	58(29%)	136(68%)	64(32%)	108(54%)	92(46%)
2	Vessels	200(100%)	__	146(73%)	54(27%)	142(71%)	58(29%)
3	Food basket Containers	82(41%)	118(59%)	162(81%)	38(19%)	136(68%)	64(32%)
4	Wiping and drying Dishes	112(56%)	88(44%)	152(76%)	48(24%)	164(82%)	36(18%)
5	Push cart	158(79%)	42(21%)	139(69.5%)	61(30.5%)	118(59%)	82(41%)
6	Chilly powder and Salt Sprinkler	64(32%)	136(68%)	142(71%)	58(29%)	135(67.5%)	65(32.5%)

Majority (71%) of the respondents used serving utensils. Only fifty six percent of the respondents either whipped or dried their vessels after cleaning the vessels. 32 percent of the serving utensils, 27 percent of the vessels, 19 percent of the food baskets, 24 percent of the wiping dishes, 30.5 percent of the push carts and 29 percent of the chilly and salt sprinklers were dirty. Like that, 46 percent of the serving utensils, 29 percent of the vessels, 32 percent of the food baskets, 18 percent of the wiping dishes, 41 percent of the push carts and 32.5 percent of the chilly and salt sprinklers were uncovered. This reveals that near about $1/3^{rd}$ of the utensils used were dirty, uncovered and unhygienic. This shows the need for nutrition and health education to the respondents.

Table No.6: Nutritional Knowledge among the Respondents			
Sl.No	**Knowledge about Nutrition**	**N=200**	**%**
1	Usage of greens	62	31
2	Usage of milk	84	42
3	Oil: a. Seasame oil	20	10
4	b. Coconut oil	21	10.5
5	c. Palm oil	89	44.5
6	d. Others (Refined Oil)	70	35
7	Germinated pulses are more nutritious than dried pulses	138	69
8	Usage of dhal water in other preparation	73	36.5
9	Pulses are rich in protein	85	42.5
10	Potato rich in carbohydrate	54	27
11	Washing vegetables before cutting	83	41.5

The above table shows that nutritional knowledge prevailing among the selected respondents. Thirty percent of them used greens for the foods mainly drumstick leaves and arakeerai, 42 percent of them used milk for preparing refreshment drinks.

Around 44.5 percent of the respondents used mainly palm oil for their food preparation because of its low cost, 35 percent of them used refined oil; 10 percent of them used coconut oil and 10 percent of them used sesame oil to prepare the food items. 69 percent of them had told that germinated are more nutritious than dried pulses. About

36.5 percent of respondents used dhal water for kootu and sambar preparation; 42.5 percent of respondents had knowledge that pulses are rich in protein and only 27 percent of the respondents had knowledge that potato rich in carbohydrate and 41.5 percent of them washed vegetable before cutting for food preparation.

From this it was clear that a notable number of the respondents were not aware of nutrition. This is because of majority of the respondents had low level of education. Most of the respondents used all types of vegetables mainly roots and tubers and green leafy vegetables.

Table No.7: Details about Nutritional Knowledge Level

Sl.No	Nutrition Knowledge Level	N=200	%
1	Poor	53	26.5
2	Better	66	33
3	Good	81	40.5

From the above table it is clear that only 42 percent of the respondents had good knowledge about nutrition followed by 33 percent who had better knowledge about nutrition and 26.5 percent had poor knowledge about nutrition. Based on these results the chi-square was calculated in the following table

Table No.8: Nutrition knowledge and Educational Status									
Sl.No	**Educational Status**	**Total N=200**	**Poor**		**Better**		**Good**		**Chi-square**
			No	**%**	**No**	**%**	**No**	**%**	
1	Illiterate	39	30	15	7	3.5	2	1	* 5.99
2	Literate	161	23	11.5	59	29.5	79	39.5	

$X^2 = 23.90$, df (2) = 5.99 < 23.90

It is understood from the above table that majority of the illiterates (76.9%) had poor knowledge on nutrition and majority of the literates had good knowledge about nutrition. From the chi-square results it is found that the association of nutritional knowledge and educational status is statistically significant.

Table No.9: Total Bacterial Count test		
Sl.No	**Name of the Food materials**	**Colony forming Units**
1	Athirasam	$3*10^4$/gm
2	Bajji	$2*10^4$/gm
3	Bonda	$3*10^4$/gm
4	Murukku	$2*10^4$/gm
5	Vadai	$1*10^4$/gm
6	Sugar cane juice	$1*10^4$/ml

Only a selected food items were taken for microbial analysis. The above table gives the microbial counts present in the selected food items like athirasam, bajji, bonda, murukku, vadai and sugar cane juice. The biggest bacterial count was present in athirasam ($3*10^4$/gm) followed by bonda ($3*10^4$/gm), Bajji ($2*10^4$/gm) Murukku ($2*10^4$/gm), Vadai ($1*10^4$/gm) and Sugar cane juice ($1*10^4$/ml).This table also reveals the need for health education to the selected respondents.

Table No.10: Fungi Count Test

Sl.No	Name of the Food Item	Fungus
1	Athirasam	Present/gm
2	Bajji	Present/gm
3	Bonda	Present/gm
4	Murukku	Present/gm
5	Vadai	Present/gm
6	Sugar cane juice	Present/ml

Fungus in street food was analyzed and results were recorded. The results clearly indicate that presence of fungi in all food samples collected from the vendors.

Table No.11: Adulterants in Food Stuffs					
Sl.No	**Food stuffs**	**Adulterants**			
		Present		**No Adulterants**	
		No. of Samples	**%**	**No. of Samples**	**%**
1	Turmeric powder	76	38	124	62
2	Chilli powder	156	78	44	22
3	Pepper	28	14	172	86
4	Sugar	48	24	152	76
5	Mustard seeds	28	14	172	86
6	Salt	144	72	56	28
7	Asafetida	12	6	188	94
8	Oil	44	22	156	78
9	Dal	32	16	168	84
10	Milk	56	28	144	72

The above table clearly depicts that there were adulterants present in the selected raw ingredients. Among the item chilly powder and salt found to highly adulterated with brick powder and chalk powder respectively. Next to them, in turmeric powder, milk and sugar were adulterated.

4. CONCLUSION

The street food vendors were poor in hygienic practices in food preparation, handling, serving and storing. They were also poor in their nutritional knowledge.

It can be concluded that as there is an urgent need for disseminating the knowledge about food safety and disease prevention, nutrition education is the need of the hour. Measures are suggested to improve the dwindling standards of the street food units. This study implies the need of the following measures to be adopted for hygienic food preparation by the street vendors, they are, license must be obtained by the street food vendors and the foods should be frequently inspected by the agencies, nutritionists should take the in-charge of disseminating awareness on hygienic practices, nutrition and health so that it will help in the preparation of nutritious foods. Colleges and other educational institutions also should take part in creating awareness about the street foods, government can encourage the vendors on improving their business by availing loan facilities and the sources of information must be increased to improve the nutrition and hygienic knowledge of the street food vendors.

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