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Original Research Article

Food safety awareness and food handling practices among rural population of Tamil Nadu

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ABSTRACT

Background: Food borne diseases (FBD) are illness caused by consuming contaminated food or drink. The contamination can occur anywhere from farm to the plate and can lead to a variety of avoidable infectious diseases. The high prevalence of food borne illness at home could be attributed to poor food hygiene and preparation due to poor awareness of proper practices. The objective of the study was to assess the awareness and practice of food safety at home among rural population in Kancheepuram district of Tamil Nadu state.
Methods: A cross sectional study was conducted in Kelambaakam village, Kancheepuram district from November 2016 to April 2017 with a sample size of 200. A pretested semi structured questionnaire was used to collect the data.
Results: Among the 200 study participants, 50.5% of the subjects have the knowledge regarding nutritive value getting diminished because of overcooking. Around 33% lack the knowledge of proper methods of washing vegetables. While 36% said consuming food not freshly prepared may lead to food poisoning, 23.5% have no idea about that. Around 46% consider price the most, rather than damaged packing (17%) or expiry date (19%) while purchasing food items in super market. Around 43.5% have the attitude that carbonated drinks help in food digestion.
Conclusions: Community awareness through systematic teaching regarding basic food safety guidelines is necessary to avoid many food borne infectious diseases in rural areas.

Keywords: Food safety, Food handling, Food borne illness

INTRODUCTION

Food borne diseases (FBD) are illness caused by consuming contaminated food or drink.[1]The contamination can occur anywhere from farm to the plate and can lead to a variety of avoidable diseases such as acute gastroenteritis, viral hepatitis. According to Food and Agriculture Organization, access to safe and healthy food is one among the essential rights of a human being. However, this right to safety food is often compromised.[2] As per WHO report, more than 150 million people in the South East Asia region fall ill due to food borne diseases, with a mortality rate of around 175 million. Around 1/3 of these figures constitute children under five years.[3] Many studies have shown that majority of food borne illness affect the developing countries of the world, of which Indian subcontinent had the highest incidence of acute diarrheal diseases.[1] According to Integrated Disease Surveillance Program, in India alone, there were more than a 1000 cases of food borne diseases reported in 2016.[4]

In order to reduce the morbidity and mortality relating to FBD, Food and Agriculture Organization (FAO) and World Health Organization (WHO) provides strict guidelines and regulations, for food processing, handling

and consumption. To emphasize the importance of food safety, the theme for World Health Day in 2015 was "From farm to plate, make food safe". The theme set out to educate the masses on food safety, new threats to food safety, food trends and preventive methods in order to strengthen food safety systems globally.[5] In India Government has its own governing body of Food Safety and standards Authority of India (FSSAI), which also supervise food safety and provide regulatory standards for food production.[6]

In spite of many regulations and guidelines, the incidences of food borne illness still continue to prevail. According to a nation- wide study conducted, the prevalence of food borne illness at the household level was 13.2%. Data from the same study also showed that 40% of the food poisoning cases occurred due to home cooked food.[7] The high prevalence of food borne illness at home could be attributed to poor food hygiene and preparation due to poor awareness of proper practices. The present study is being conducted to assess the awareness, knowledge and practice of food safety at home among rural population in Kancheepuram district of Tamil Nadu state.

METHODS

Study type

The study was a cross sectional study conducted in Kelambakkam village, Kancheepuram district of Tamil Nadu state, India

Study duration

The study was conducted from November 2016 to April 2017.

Sample size determination

From the previous study it was found that prevalence of food awareness was found to be 13%. Sample size for cross sectional study with 13% prevalence, 5% relative error and 10% non-response rate, the sample size arrived was 200.

Sampling and study population

The study population comprised of residents of Kelambakkam village of Thiruporur block located in Kancheepuram district of Tamil Nadu. Accoroding to census 2011, there were 13 blocks in Kancheepuram district. Simple random sampling was used to select one block (Thiruporur block) from 13 blocks. Out of 50 villages in Thiruporur block, Kelambakkam village was selected by simple random sampling with lottery method. As per population census 2011, the village has total population of 7984 with 3992 males and 3992 females. Houses in the village were enumerated and participants were enrolled by systemic random sampling method-alternative houses after choosing first house randomly. One person either male or female whomsoever available at the house at the time of data collection was included from each house. Inclusion criteria: 1) Residents of ≥18 to 60 years of age 2) Residents of the village for more than 6 months. Those who cannot be contacted even after three visits were excluded.

Data collection procedure

After obtaining written informed consent the participants were interviewed using pretested questionnaire by trained investigators in the local language i.e. Tamil.

Study instrument

A pretested, validated study questionnaire was used to collect the data. The study instrument comprises of four sections. Section 1 comprises of Socio-demographic details such as age, sex, education, occupation, marital status, socioeconomic status (modified BG Prasad classification). Section 2 comprises of knowledge on food handling practices. Section 3 include attitude towards food practices like washing of vegetables, eating of raw vegetables, intake of carbonated/beverages and energy drinks like Horlicks, Bournvita etc. and attitude towards food poisoning. Section 4 include questionnaires regarding food hygiene practices at home like food habits, source of drinking water and milk, method of cooking of egg and milk products, hand washing practices, methods used to clean vegetables/fruits, storage of cooked food items, frequency of gastroenteritis infections among family member in last one year.

Outcome variables

The outcome variables include those which assess the knowledge and attitude towards food hygiene and food handling practices at home.

Statistical Analysis

Data was entered in Microsoft Excel spread sheet and analyzed in Statistical Package for Social Sciences (SPSS -IBM) software version 21. For qualitative variables proportions for quantitative variables mean, median, range and standard deviation were calculated. Data were assessed for normality before applying tests of significance. Chi square test was applied. $P<0.05$ was considered significant.

Ethical consideration and confidentiality

Institutional Ethical Committee approval was obtained before starting of the study. Confidentiality of study participants was maintained in all the phases of the study.

RESULTS

Totally 200 participants were studied. Majority (40.5%) of the study participants were between 31-45 years of age. Almost 36% of the cases were unemployed.

On assessing the knowledge on food safety, around 24.5% had no knowledge about overcooking.48% said that reheating of food is not harmful and 26.5% did not know that foods which are not freshly prepared could cause food poisoning (Table 2).

Table 1: Profile of study participants (N=200).

S. No.	Socio-demographic profile	Frequency	Percentage (%)
1.	Gender		
	Male	91	45.5
	Female	109	54.5
2	Age group (in years)		
	18-30	40	20
	31-45	81	40.5
	46-60	55	27.5
	>60	24	12
3.	Education		
	Illiterate	60	30
	Primary	27	13.5
	Middle	25	12.5
	High School	36	18
	Intermediate/post high school diploma	13	6.5
	Graduate and above	39	19.5
4.	Occupation		
	Professional	5	2.5
	Semiprofessional	24	12
	Clerk/shop owners	12	6
	Skilled	9	4.5
	Semiskilled	8	4
	Unskilled	70	35
	Unemployed/housewives	72	36
5	Socioeconomic status*		
	Upper class	4	2
	Upper middle class	149	74.5
	Lower middle class	42	21
	Upper lower class	5	2.5

*According to modified BG Prasad classification.

Table 2: Distribution of study participants according to knowledge on food safety (N=200).

S no	Variables	Frequency	Percentage (%)
1	Overcooking diminishes nutritive value of the food		
	Yes	101	50.5
	No	50	25
	Don't know	49	24.5
2	Reheating of food is		
	Absolutely harmful	86	43
	Absolutely unharmful	96	48
	Can be done at set temperature	18	9
3	Correct method of washing vegetables		
	Washing after cutting	66	33
	Washing before cutting	133	66.5
	Wiping with towel/cloth	1	0.5
4	Consuming food which is not freshly prepared causes food poisoning		
	Yes	72	36
	No	53	26.5
	Not necessarily	28	14
	Don't know	47	23.5

Table 3: Attitude of study participants toward food handling practices and food safety (n=200).

S no	Variables	Frequency	Percentage (%)
1	Considering most while purchasing food items in super market		
	Price	92	46
	Brand	36	18
	Damaged packing	34	17
	Manufacture date and expiry date	38	19
2	Washing vegetables before cooking is necessary		
	Disagree	2	1
	Agree	193	96.5
	Neutral	5	2.5
3	Carbonated drinks helps in digestion		
	Yes	87	43.5
	No	69	34.5
	Don't know	44	3
4	Food supplements are more important in growth and development than cereals, veg, fruits etc		
	Yes	83	41.5
	No	57	28.5
	Supplemented with regular cereals and pulses	32	16
	Don't know	28	14
5	Food poisoning may occur after consuming street foods		
	Correct	168	84
	Not correct	7	3.5
	Don't know	25	12.5

Table 4: Distribution of study participants according to food handling and safety practices (n=200).

S no	Variables	Frequency	Percentage (%)
Food handling practices			
1	Milk consumption		
	After boiling	197	98.5
	Consume raw	3	1.5
2	Cooking eggs		
	Consume raw	5	2.5
	In a separate vessel	173	86.5
	In vessel along with other food	22	11
3	Washing hands after handling unwrapped raw foods		
	Before handling	104	52
	After handling	16	8
	Both before and after handling	74	37
	Don't wash	6	3
4	Methods used for cleaning veg/fruits		
	Only before cutting	91	45.5
	Only after cutting	59	29.5
	Only dipping in a bowl of water	37	18.5
	Only washing in running tap water	13	6.5
5	Consume carbonated drinks after meal		
	Never	66	33
	Occasionally	102	51
	Frequently	31	15.5
	Every time	1	0.5
Food safety practices			
6	Vegetables buying frequency		
	Daily	54	27
	Twice a week	56	28
	Weekly once	75	37.5
	Thrice a week	15	7.5

Continued.

S no	Variables	Frequency	Percentage (%)
7	Separate kitchen		
	Present	164	82
	Absent	36	18
8	Flies in kitchen		
	Yes	115	57.5
	No	72	36
	Not paid attention	13	6.5
9	Rodents in kitchen		
	Yes	67	33.5
	No	102	51
	Not paid attention	31	15.5
10	Storage of cooked items		
	Never	23	11.5
	Closed containers	94	47
	Refrigerator	83	41.5

Table 5: Distribution of participant's adequate knowledge according to demographic profile.

S no			Adequate knowledge N (%)		P value
			Yes	**No**	
1	Age	18-30	12 (30)	28 (70)	0.386
		31-45	28 (34.5)	53 (65.4)	
		46-60	15 (27.27)	40 (72.72)	
		>60	4 (16)	20 (84)	
2	Education	Illiterate	14 (23.33)	46 (76.66)	0.639
		Literate	45 (32)	95 (68)	
3	Occupation	Unemployed	21 (29)	51 (71)	0.386
		Unskilled	24 (34)	46 (66)	
		Semiskilled	5 (25)	15 (75)	
		Skilled	9 (24)	29 (76)	
4	SES	Upper lower	3 (60)	2 (40)	0.476
		Lower middle	11 (26)	31 (74)	
		Upper middle	44 (29.5)	105 (70.5)	
		Upper class	1 (25)	3 (75)	

Chi square test applied, p<0.005 is significant.

Table 6: Occurrence of food poisoning.

		Food poisoning affected N (%)		
		Yes	**No**	
Adequate knowledge	Yes	21 (36)	38 (64)	0.523
	No	57 (40)	84 (60)	
Adequate practice	Yes	18 (29)	45 (71)	0.040
	No	60 (44)	77 (56)	

Chi square test applied, p<0.005 is significant.

Among the study participants around 43.5% had the attitude that carbonated drinks help in digestion and 41.5% had the attitude that food supplements like Horlicks, Bournvita etc. are more important in growth and development than cereals, veg, fruits etc. (Table 3).

Around 86% of the study participants were Non Vegetarians. Source of drinking water for most of them were hand pump water (46.5%) and around 38.5% consume packed milk.98.5% consume milk only after boiling it. 31.5% had at least 1 episode of Acute Gastroenteritis last year (Table 4).

Among those who have adequate knowledge (59) (29.5%), only 25(42.3%) had adequate practice (Table 6).

DISCUSSION

The present study conducted at Kelambakkam village of Thiruporur block located in Kancheepuram district of

Tamil Nadu, included 200 subjects. Most of the study subjects were between age group of 31-45 years of age. According to a study done by Roseman et al, socio demographic profile like age, education level and income have influence on food safety knowledge and practices.[8] Likewise this study showed that literates had better knowledge about food safety than the illiterates and upper middle class group had better knowledge about food safety than the lower classes.

In the present study only 29.5% had the adequate knowledge about overcooking, reheating, washing vegetables and consuming fresh foods altogether. When considered separately almost 50.5% had the knowledge that overcooking could diminish the nutritive value of the food. In the present study 24.5% did not have the knowledge regarding the relationship between overcooking and nutritive value. Only 43% knew that reheating of food is absolutely harmful and around 48% said that reheating is not harmful. A study done in Kannur district by Nithya et al showed that 12% of the rural population are unaware of the safety food handling practices.[9] When asked about correct method of washing 66.5% said that washing before cutting is correct whereas 33% said washing after cutting is the correct method.

According to 26.5% and 14% study participants consuming food not freshly prepared will not and not necessarily cause food poisoning respectively.

In this study, upon investigating the food safety behavior, it was found that 52% subjects wash their hands before and only 8% wash after handling raw food and only 37% was before and after handling raw food. A study done by Sudershan et al in Hyderabad showed that 100% wash hands before and 98% wash hands after cooking and 90% wash hands both before and after cooking.[10] A similar study done by Byrd-Bredbenner et al showed that 79% wash hands before cooking.[11] A study done in Delhi showed that only 23.5% wash hands before cooking before health education.[12] Hand washing, done properly before and after handling food is the most effective way to prevent food borne illness.

Among those who have correct knowledge only 25 subjects practices adequate food handling practices.

In this study among those who don't have adequate safety practices, around 60 developed age in the last year. According to a study done by Sudershan et al, around 21% developed food borne illness in the previous year.[10] The safety of cooked food and raw food depends only on the temperature at which it is stored. Unless proper thawing before reheating the foods tend to get spoiled. Also flies and rodents in the kitchen infest microorganisms leading to age. Proper washing before and after handling raw foods, washing of all the vegetables before cooking and eating freshly prepared food will reduce the chance of getting age.

CONCLUSION

Food safety starts from the farm to the plate. Food contamination can occur anywhere in the food cycle. Food sanitation starts from personal hygiene, germ free preparation area to the dishes being microbes free. Food contamination can lead to disease outbreaks and can lead to food borne illness and intoxication. This study demonstrates that the knowledge towards food handling is not adequate and those who has adequate knowledge don't practices it regularly affirming the old saying "Knowledge is of no value, unless you put it into practice". Continuous Food safety education in rural areas and motivation is needed to increase the awareness about the WHO's five key principles of food hygiene[13], which are keep clean, separate raw and cooked food, cook thoroughly, keep food at safe temperatures and use safe water.

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