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KNOWLEDGE, ATTITUDE AND PRACTICE ON FOOD SAFETY AND HYGIENE AMONG MEDICAL STUDENTS IN A TERTIARY CARE HOSPITAL KANCHIPURAM- A CROSS SECTIONAL STUDY

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Abstract:

Introduction: Foodborne illnesses result from the ingestion of food or beverages that have been contaminated. Contamination can manifest in any location between the farm and the plate, and it can give rise to an assortment of preventable infectious diseases. Due to a lack of awareness regarding proper procedures, inadequate food hygiene and preparation may account for the high incidence of foodborne illnesses. **Objectives:** To assess the Knowledge, Attitude and Practice on food safety and hygiene among medical students. **Methodology:** A cross-sectional study was undertaken among medical students attending a Kanchipuram tertiary care institution. A stratified random sample of 205 individuals was utilised for the research. Descriptive statistics were computed for descriptive variables as well as variables pertaining to food hygiene knowledge, attitude, and practices. **Result:** A remarkable 94.6% of participants exhibited satisfactory levels of knowledge, however, discrepancies in understanding were observed, specifically in the areas of leftover food safety and microbial presence on the human body. This highlights the critical need for targeted educational interventions. While positive behaviors such as frequent handwashing (95.1%) were prevalent, there were concerning practices such as sampling food with unwashed hands (52.2%) that call for targeted interventions. Overall attitudes were optimistic, yet certain concerns surrounding reheating and pesticide residues call for focused campaigns. **Conclusion:** Medical students must get comprehensive instruction on fundamental food safety principles to prevent many cases of foodborne infectious illnesses.

Keywords: Food Safety, Food Handling, Food Borne Illness.

INTRODUCTION

Foodborne diseases (FBD) are illnesses that result from ingesting food or drink that has been polluted.[1] Contamination may arise at any point in the food supply chain, from the farm to the plate, and can result in the development of preventable illnesses such as acute gastroenteritis and viral hepatitis.

As to the Food and Agriculture Organisation, the ability to get safe and nutritious food is a fundamental entitlement of every individual. Nevertheless, the guarantee of food safety is often undermined.[2] According to research by the World Health Organisation (WHO), over 150 million individuals in the South East Asia area get sick as a result of foodborne illnesses, resulting in a death rate of over 175 million.[3]

Approximately one-third of these statistics consist of youngsters under the age of five. Multiple studies have shown that the majority of cases of food borne illnesses occur in underdeveloped nations. Among these countries, the Indian subcontinent has the greatest occurrence of acute diarrheal disorders.[4]

According to the Integrated Disease Surveillance Programme, there were over 1000 recorded cases of foodborne infections in India.[5]

Global data on food-borne illnesses indicate a consistent annual rise in the occurrence of food-borne infections.[6] Foodborne illness incidents are mostly recorded among students who regularly patronise university canteens and dormitory kitchens.[7]

The primary contributing causes to those instances of food poisoning include inadequate temperature control during storage and handling, as well as a lack of adherence to proper personal hygiene practices.[8]

Hence, it is important to educate food consumers on the correct food handling protocols to mitigate the risk of food-borne illnesses. Providing education is essential for enhancing the understanding of those who eat food.

Universities are seen as crucial entities for promoting health and influencing health-related behaviours, especially hygiene-related behaviours.[9] The habits established during student life have a tendency to persist and become difficult to alter in later stages of life. Consequently, students who get a thorough education may maintain appropriate hygiene habits throughout their lifetime.[10]

The present study was conducted to assess the knowledge, attitude and practice on food safety and hygiene among medical students.

MATERIAL AND METHODS

Study Type and Duration

This was a cross-sectional study conduced in a tertiary care hospital for a period of 6 months.

Sample Size Determination

Eighty-five percent of participants, according to a study conducted by the faculty of veterinary medicine at Trakia University in Bulgaria[11], possessed a high level of food safety knowledge.

By employing the formula 4pq/l2 and accounting for a 5% margin of error, 204 was determined to be the sample size. Assuming a non-response rate of 5%, the estimated sample size was 214.

Study Population

Inclusion Criteria: MBBS students (Phase I -IV), studying in the tertiary care hospital, who were willing to participate in the study were included.

Exclusion Criteria: Students who were not approachable after three consecutive visits were excluded.

Data Collection and Statistical Analysis

The information was gathered via Google Form using a pretested, validated, semi-structured questionnaire. analysed using version 21 of the Statistical Package for the Social Sciences (SPSS-IBM) software.

The descriptive statistics were computed using frequency/percentages. The normality of the data was evaluated prior to conducting tests of significance. A chi-squared test was conducted. It was deemed significant if P is less than 0.05.

Ethical Consideration and Confidentiality

Prior to the commencement of the investigation, approval was obtained from the Institutional Ethical Committee. The confidentiality of study participants was upheld throughout all stages of the research.

RESULTS

Majority of participants were in the age group of 22-25 years (77.6%), male (60%), and predominantly in their 2nd and 3rd years of study (48.7%). Furthermore, more participants were day scholars (45.4%)

Table 1: Profile of the Study Participants

S No	Variable	Frequency	Percentage
1	**Age (Years)**		
	18 – 21	46	22.4
	22 – 25	159	77.6
2	**Gender**		
	Male	82	40
	Female	123	60
3	**Year of study**		
	1st year	58	28.3
	2nd year	37	18
	3rd year	63	30.7
	4th year	47	22.9
4	**Type of Residence**		
	Hostel	76	37.1
	Day scholar	93	45.4
	Private residence	36	17.6

Majority exhibited good knowledge across all domains, with percentages ranging from 59.5% to 95.1%. Notably, a high level of awareness was observed regarding health and economic effects of food poisoning (94.6%), while a smaller proportion expressed knowledge gaps in areas such as leftover food smell versus safety (59.5%).

Table 2: Knowledge Distribution among the Study Participants

S No	Knowledge on	Yes (%)	No (%)	Don't know (%)
1	Health and Economic Effects of Food Poisoning	194(94.6)	4(2)	7(3.4)
2	Storage of Raw and Cooked Food and contamination risk	145(70.7)	51(24.9)	9(4.4)
3	Leftover Food Smell vs. Safety	122(59.5)	70(34.1)	13(60.3)
4	Inadequate Cooking of Raw Food	147(71.7)	41(20)	17(8.3)
5	Contaminated Water as a source of disease Transmission	167(81.5)	29(14.1)	9(4.4)
6	Diarrhoea Transmission through Contaminated Food	150(73.2)	42(20.5)	13(6.3)
7	Global Disparity in Food Poisoning	160(78)	26(12.7)	19(9.3)
8	Presence of Microorganisms on Human Body	159(77.6)	30(14.6)	16(7.8)
9	Milk Allergies	165(80.5)	23(11.2)	17(8.3)
10	Handwashing and Contamination Risk Reduction	169(82.4)	26(12.7)	10(4.9)

Overall, positive practices were reported, with the majority engaging in handwashing before and after cooking (95.1%), reading conditions of use and storage on packed food (83.4%), and washing fruits and vegetables before eating (90.7%). However, a considerable proportion engaged in potentially risky practices, such as tasting food with unprotected hands (52.2%).

Table 3: Practice Distribution among the Study Participants

S No	Practice	Yes (%)	No (%)
1	Handwashing Before and After Cooking	195(95.1)	10(4.9)
2	Tasting Food with Unprotected Hands	107(52.2)	98(47.8)
3	Reading Conditions of Use and Storage on Packed Food	171(83.4)	34(16.6)
4	Separating Raw Chicken or Meat from Other Food	158(77.1)	47(22.9)
5	Dishwashing Method (Detergent and Water or Dishwasher)	172(83.9)	33(16.1)
6	Refrigeration Duration for Food	134(65.4)	71(34.6)
7	Usage of hand to cover mouth during Coughing or Sneezing While Cooking	182(88.8)	23(11.2)
8	Wearing Accessories (Ring and Bracelet) During Cooking	133(64.9)	72(35.1)
9	Reading Labels, Including Use-By and Expiry Date, Before Using Packaged Food	184(89.8)	21(10.2)
10	Washing Fruits and Vegetables Before Eating	186(90.7)	19(9.3)

Participants generally exhibited positive attitudes, with a high agreement percentage across various statements. For instance, a substantial majority agreed on the importance of avoiding refreezing defrosted food (78.5%) and reading food labels before purchase (70.7%).

However, some neutrality was observed, particularly in statements related to reheating causing cross-contamination and concerns about pesticide residues in vegetables.

Table 4: Attitude of Medical Students towards Food Safety and Hygiene

S No	Attitude	Agree (%)	Disagree (%)	Neutral (%)
1	Avoid refreezing defrosted food	161(78.5)	13(6.3)	31(15.1)
2	Reading food label before purchase is important	145(70.7)	50(24.4)	10(4.9)
3	Reheating food cause cross contamination	137(66.8)	32(15.6)	36(17.6)
4	Concerns About Pesticide Residues in Vegetables	152(74.1)	37(18)	16(7.9)
5	Willingness to Improve Knowledge on Food Safety	167(81.5)	27(13.2)	11(5.4)
6	Cleaning Food Preparation Area Before and After Use	166(81)	27(13.2)	12(5.9)
7	Use of Drinkable Water in Kitchen	154(75.1)	40(19.5)	11(5.4)
8	Shared Use of Towel for Cleaning Food Contact Surfaces and Hands	124(60.5)	66(32.2)	15(7.3)
9	Avoidance of Chopping Different Meats on the Same Cutting Board	161(78.5)	32(15.6)	12(5.9)
10	Proper Sanitization of Cooking Cutlery	168(82)	24(11.7)	13(6.3)

Significant associations were found in several instances. For example, age was significantly associated with knowledge ($p = 0.001$) and attitude ($p = 0.020$), indicating variations in awareness and perspectives among different age groups.

Similarly, the year of study showed significant associations with knowledge ($p = 0.000$), suggesting an impact of academic progression on food safety understanding. The type of residence exhibited a trend towards significance ($p = 0.056$) concerning participants' practices, suggesting potential differences based on living arrangements.

Table 5: Association between the Variables and Knowledge, Practice and Attitude among the Study Participants

Variable	Knowledge			Attitude			Practice		
	Good (%)	Poor (%)	P value	Good (%)	Poor (%)	P value	Good (%)	Poor (%)	P value
Age (Years)									
18 – 21	37 80.4)	9(19.6)		34(73.9)	12(26.1)		43(93.4)	3(6.6)	
22 – 25	104 (65.4)	55(34.6)	0.052	90(56.6)	69(43.4)	0.034*	112(70.4)	47(29.6)	0.001*
Gender									
Male	55(67)	27(33)		48(58.5)	34(41.5)		55(67)	27(33)	
Female	86(69)	37(31)	0.666	76(61.7)	47(38.3)	0.64	100(81.3)	23(18.7)	0.020*
Year of study									
1st year	37 (63.7)	21 36.3)		29(50)	29(50)		45 (77.5)	13(22.5)	
2nd year	27 (72.9)	10 27.1)		22 (59.4)	15(40.6)		28 (75.6)	9(24.4)	
3rd year	39 (61.9)	24 38.1)		40 (63.4)	23 (36.6)		37 (58.7)	26(41.3)	
4th year	38 (80.8)	9 (19.2)	0.135	33 (70.2)	14 29.8)	0.188	45 (95.7)	2(4.3)	0.000*
Type of Residence									
Hostel	62(66.6)	31(33.4)		59(63.4)	34 (36.6)		63 (67.7)	30(32.3)	
Day scholar	56 (73.6)	20 26.4)		46(60.5)	30 (39.5)		62 (81.5)	14(18.5)	
Private residence	23 (63.8)	13 36.2)	0.485	19 (52.7)	17 (47.3)	0.539	30 (83.3)	6(16.7)	0.056

*p value < 0.05, statistically significant, Chi square

DISCUSSION

The primary aim of this investigation was to evaluate medical students' understanding, stance, and adherence to food safety and hygiene protocols. Upon evaluating the participants' knowledge, it was discovered that a significant proportion of them (94.6%) possess a comprehensive understanding of the health and financial ramifications associated with food poisoning. This finding signifies a notable degree of consciousness in this critical domain. Nevertheless, certain domains remain unexplored, including the comprehension of residual food safety (59.5%) and the prevalence of microorganisms on the human body (77.6%). Similar findings were shown in a study done by Garayoa R et al.[12] Recent research conducted at Taif University revealed that nearly half of the students possessed inadequate knowledge regarding unrefined foods, which are the primary contributors to food poisoning.[13] According to a study by Courtney SM et al., students provided an average of 6.2 accurate responses to eleven knowledge-based queries.[14]

Prior research conducted by Al-Shabib et al. (2017) revealed that approximately 96% of respondents were concerned about the proper preparation of food, given that improper cooking is the leading cause of food-borne illnesses.[15] The consumption of raw foods can facilitate the transmission of harmful pathogens, which can cause gastrointestinal (GI) infections, diarrhoea, and human diseases. This result is comparable to those of Osaili et al., who examined Jordanian college female students, and another study conducted among Saudi Arabian schoolchildren.[16]

Significantly, a vast majority of individuals (95.1%) observe positive behaviours, including handwashing prior to and following each meal. Nevertheless, certain alarming behaviours were exposed, including the utilisation of unprotected hands to sample food (52.2%) and the failure to refrigerate food for the prescribed time period (34.6%). It is imperative to improve food safety practices as a whole by implementing targeted interventions and educational campaigns that address these practices. Upon comparing the current study to prior research, it becomes apparent that the awareness levels of medical students are consistent with fundamental food safety and sanitation

principles. In regard to food safety and hygiene, research conducted by Sockett et al. in 1995[17] and Majowicz et al. in 2016[18] revealed a significant correlation between knowledge and attitude. Concerns and areas for improvement in attitudes regarding reheating-induced cross-contamination (66.8%) and pesticide residues in vegetables (74.1%), for instance, are reflected in the present study.

Although a considerable percentage of respondents (77.5%) concur that it is crucial to read food labels and avoid refreezing defrosted foods, there are also regions of neutrality and disagreement. For example, there is potential for development in reactions to the notion that reheating can lead to cross-contamination (66.8%) and apprehensions regarding pesticide residues in vegetables (74.1%). The results of this study indicate that in order to rectify particular attitudes and perceptions regarding food safety, targeted interventions are necessary. The results of this study are consistent with those of other institutions worldwide, such as Trakia University in Bulgaria[11], Taif University[13], Shahroud University[19], and private university students in Malaysia.[20]

The recognition of knowledge deficiencies and inadequate procedures in numerous research studies emphasises the worldwide significance of focused interventions aimed at improving the awareness, attitudes, and behaviours regarding food safety among a wide range of students.

CONCLUSION

The results showed a strong understanding of medical knowledge among the students (94.6%), but revealed concerning gaps in areas such as food safety for leftovers and microorganisms on the human body. While positive habits like handwashing were observed in the majority of students (95.1%), there were concerns about certain practices such as tasting food with unprotected hands (52.2%). Overall, the students showed generally positive attitudes, but there were specific concerns regarding the safety of reheating food and the presence of pesticide residues. To improve food safety awareness among medical students, it is highly recommended to implement targeted educational initiatives, promote positive practices, and conduct awareness campaigns to shape attitudes. These crucial steps will empower future public health leaders and enhance the overall understanding of safe food practices.

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