ASSESSMENT OF FOOD SAFETY KNOWLEDGE AMONG SCHOOL TEACHERS OF ETAWAH DISTRICT DURING COVID-19

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ABSTRACT: Covid-19 pandemic that emerged a global threat on public health in 2019, continue to affect common people in many aspects of their life. National and international organizations are focusing on preventive measures of Covid-19 includes personal hygiene and healthy life style with standard food safety behaviours. Since the outbreak of Covid-19 pandemic, teachers, and students health aspects are most considerable in the schools in Worldwide. As considering this aspect, study aimed to assess the knowledge of food safety among teachers working in private schools. The study was conducted in private schools of Etawah district, U.P., India. The sample consisted of 100 school teachers from four private schools in difference zones of Etawah. World Health Organization's food safety questionnaire was used to assess the food safety knowledge level with survey method. The data was analyzed using Statistical Package for Social Science (SPSS) version 21. The result revealed that 58% of the subjects had average knowledge of food safety on the other hand 41% of subjects had good knowledge of food safety. However there was no co-relation found between demographic variables and the total knowledge of food safety. Study concluded that more than half of the subjects having average knowledge of food safety during Covid-19 pandemic. Intervention should be given to enhance the knowledge of food safety among school teachers through whom can create best knowledge among children and adolescents populations.

KEYWORDS: Food safety, Knowledge, Food hygiene, Foodborne illness, Covid-19.

Covid-19 pandemic reinforced general public hygienic safe food handling behaviours towards include proper hand washing before consumption of food, buying and eating healthy foods and washing food items properly before eating or cooking food (Chenarides et al., 2021; Di Renzo et al., 2020; Faour-Klingbeil et al., 2021; Maragoni-Santos et al., 2021). According to World Health Organization (WHO) (2021) Covid-19 disease is caused by SARS-COV-2 virus, which transmits from infected person to another person via direct or indirect contact through respiratory droplets or respiratory secretions or saliva. As per Centers for Disease Control and Prevention (CDC) (2021), currently there is no report of Covid-19 transmission through food. However, there is possibility of Covid-19 transmission by an infected person through the food preparation, food packages, and utensils with his contaminated hands. Safe hygienic preparation and handling of food is always essential in promotion of health and prevention of diseases.

As per report of WHO (2021) approximately two-thirds of the global mortality and also more than 35 millions morbidity around the world are caused by non- communicable diseases. Disorders associated with life style and dietary practices such as cardiac disorders, hypertension, diabetes mellitus and cancer are extensively accounting for global disease burden, and deaths (WHO, 2016). Now, preventive measures for controlling non-communicable diseases and its related deaths such as dietary guidelines and labelling legislations for improving food safety and promoting public health were effectively implemented by many countries around the World. Food labelling contains nutritional information on the food packages helps to identify and compare nutrient differences between food items. Although around 80% Consumers were not able to estimate the daily

nutritional requirements of the body through food labelling of the packaged food (Miller and Cassady, 2015). Food borne diseases are considered as major health issue in developing and developed nations. As per WHO report, approximately 30% of food borne diseases was reported in developed countries per year and annually 2 million lives were lost due to food borne diseases in developing countries including 1.9 million deaths of innocent children (Tessema et al., 2014).Vital statistics reports of the many countries revealed that 4.8 million Americans, 4 million Canadians and 2.4 million British people suffers with food borne diseases outbreak every year (CDC, 2021; Daniel et al., 2018; Government of Canada (GOC), 2016).

A European Food Safety Authority (EFSA) (2010) report revealed that food services related food borne diseases are nearly accounted for 48.7% in a year. Further, European centre for disease prevention and control reported that 5196 food borne and water borne outbreaks, 5946 hospital admissions and 11 deaths due to food borne outbreaks were occurred in the European Union at 2013. Prevention food borne disease outbreak is closely associated with food safety and quality of food consumption by the people.

Sanlier and Konaklioglu (2012) stated that strict food safety measures can prevent more than 250 different kind of food borne disease. Untrue to common belief, food prepared at home are no safer around the world. It was revealed that home preparations are one of the leading causes in food borne disease outbreak. Improper cooking methods and usage of contaminated raw food materials at home food preparation are considered as main sources for food borne disease outbreak reported at home. Also, poor personal hygiene, lack of kitchen sanitation and improper storage of food are contributing factors to food borne disease outbreaks at home.

The environment of school can affects the scholar food preferences and habits of food consumption. The school is responsible for ensuring its pupils to follow safe and hygienic food handling practices such as proper hand washing before consumption of food, consumption of healthy and balanced diet. Maintenance of cleanliness in common dining areas and availability of healthy and hygienic foods in the school campus are some of the prime responsibility of the school to ensure adequate food safety in the school in order to prevent food borne outbreaks among young school children (CDC, 2019).

Childhood illness is known for easily preventable and treatable with simple cure and remedies at home. Even though, millions of children affected with food borne diseases and lost their lives due to neglected care. School going children and adolescents are at risk population due to the negligence of safe, healthy foods as well as no availability of the basic sanitation in the school environment (Save the Children, 2022).

Lange et al. (2014) stated that Food safety education for young school going children and adolescents is essential. Moreover, the food safety syllabus should be included in school curriculum and should have taught about hygienic and healthy home food preparation.

School teachers play an essential role to educate and create awareness of food safety among school students. Insufficient food safety knowledge, lack of self-efficacy and training, limited skills in nutrition and food safety curriculum are the main limitations of school teachers for teaching food safety subjects at school level (Stage et al., 2018; Elsden-Clifton and Futter-Puati, 2015; Lecky, 2014; Ballam, 2018). So that having qualified teachers with professional development and sufficient knowledge of food safety is the most important key factor to achieve the awareness of food safety among the target audience of school going children and adolescent population. Although it may practically applicable in real life situation at home environment and motivates the young consumer to follow the food safety rules (Batista et al., 2021).

METHODOLOGY

Etawah District was selected as the study area in this research. Total area of the Etawah District was divided into four zones as North zone, South zone, East zone and West zone. From each zone, one school, in totally four schools were selected to collect samples for this study. World Health Organization's food safety questionnaire was used to assess the awareness level of food safety knowledge among school teachers with survey method. Private school teachers were selected as samples from Etawah district, to participate in this study. The calculated sample size was 100. Cluster sampling method was used to select the samples.

The samples were obtained from private schools situated in all the four zones such as North zone, South zone, East zoon and West zone, in total four schools were selected and from the four schools, 100 teachers were selected for the study. Inclusion criteria for sample were the teachers of the Academic Year 2021-22 from private schools; both gender; from all the categories, Pre School Teachers, Primary Teacher, Trained Graduate Teacher and Post Graduate Teachers; who were willing to participate in this study; who were all available during the period of data collection. Exclusion criteria for sample were the teachers, who were not interested to participate in this study; who didn't available during data collection.

DATA COLLECTION

The data collection technique used in collecting the research data in this study was questionnaire method. World Health Organization's food safety questionnaire was administrated for collection of demographic information, awareness level of knowledge of food safety among teachers in private schools directly (Batista et al., 2021). In consider to enhance the responsibilities for assuring the food safety, the World Health Organization promoted the Five Keys to Safer Food Manual with questionnaire form in 2001. It places an essential role to create awareness of food safety along with research study among various populations. It was developed based on scientific principles after consultation with food safety experts and risk communicators. WHO introduced the five keys to safer food programme with purposes of promoting food safety and preventing food borne diseases? The main components of the five keys of safer food programme are to keep clean, separate raw and cooked food, cook thoroughly, keep food at a safe temperature and use safe water and raw materials (Fontannaz-Aujoulat et al., 2019). It can be useful in all kind of settings (Mwamakamba, 2012). World Health Organization's Five Keys to Safer Food Manual questionnaire was adapted to collect data regarding the knowledge of food safety awareness level among teachers. The questionnaire was comprised of two parts which include, (i) Demographics of the participants, (ii) Knowledge part contains 11 questions. Response to each item was "True" or "False". For correct answer one mark was given and for wrong answer zero mark was given. The total knowledge score were obtained by summing up the marks gained for each item. Correct answers were coded as"1" and wrong answers were coded as"0". Knowledge score 1 to 3 was categorised as poor knowledge, 4 to 7 was average knowledge and 8 to 11 was good knowledge. The quantitative data were coded and analyzed using the Statistical Package for Social Science (SPSS) software version 21, to assess the knowledge of food safety and to test the association between demographic information and the food safety knowledge.

ETHICAL CONSIDERATION

Before filling the questionnaire, the written informed consent was received from the Heads of the Schools. The subjects were explained the nature and the purpose of the study before conduct the study. There were no risks or harm involved during data collection and no any sensitive questions were asked from the subjects. The participations in the study were voluntary and their confidentiality was protected.

RESULTS AND DISCUSSION

Table 1: describes the demographic characteristics of the subjects. The result depicted that around 64% of females and 36% of male school teachers participated in the study. Majority of the participants (78%) completed post graduate master degree. 37% were primary teachers and 31% were post graduate teachers. Most of them were married (75%) and of these, 35% having four children. Maximum of the participants lived with joint family 81%. Maximum of the subjects were vegetarians. 44% of the subjects reported "Excellent" practice of food safety habits. The main sources of food safety information was reported by the participants was from the family (43%). However, most of them (72%) were responded as "No" compromised food safety in regards with cultural practice of food safety.

TABLE 1: DISTRIBUTION OF THE SUBJECTS BASED ON DEMOGRAPHIC CHARACTERISTICS

S.NO	VARIABLE	CATEGORY	FREQUENCY (n)	PERCENTAGE (%)
1.	GENDER	Male	36	36.0
		Female	64	64.0
2.	AGE GROUP	20-25 years	09	09.0
		26-30 years	24	24.0
		31-35 years	29	29.0
		36-40 years	16	16.0
		41-45 years	22	22.0
3.	EDUCATION	Graduate	22	22.0
		Master Graduate	78	78.0
		M. Phil	00	00.0
		Ph. D	00	00.0
4.	OCCUPATION	Pre Primary Teacher	10	10.0
		Primary Teacher	37	37.0
		Trained Graduate Teacher	22	22.0
		Post Graduate Teacher	31	31.0
5.	MARITAL STATUS	Married	75	75.0
		Unmarried	25	25.0
6.	CHILDREN HAVING	1	26	26.0
		2	29	29.0
		3	10	10.0
		4	35	35.0
7.	FAMILY TYPE	Nuclear Family	12	12.0
		Joint Family	81	81.0
		School Hostel	07	07.0
8.	LIVING ENVIRONMENT	Rural	15	15.0
		Urban	85	85.0
9.	FOOD HABIT	Vegetarian	81	81.0
		Non-Vegetarian	19	19.0
10.	SELF RATING OF FOOD SAFETY HABITS	Poor	00	00.0
		Good	17	17.2
		Very Good	38	38.4
		Excellent	44	44.4
11.	SOURCE OF FOOD SAFETY INFORMATION	Family	43	43.0
		Healthcare Professional	26	26.0
		Workshops	01	01.0
		Social Media	30	30.0
12.	CULTURAL PRACTICE THAT COMPROMISED FOOD SAFETY	Yes	28	28.0
		No	72	72.0

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TABLE 2: DISTRIBUTION OF SUBJECTS BASED ON FOOD SAFETY KNOWLEDGE

S.NO	STATEMENT	OPTIONS	FREQUENCY (N)	PERCENTAGE (%)
	KEY 1- KEEP CLEAN			
K1a.	It is important to wash hands before handling food.	True*	99	99.0
		False	01	01.0
K1b.	Wiping cloths can spread microorganisms.	True*	83	83.0
		False	17	17.0
	KEY 2 – SEPARATE RAW AND COOKED			
K2a.	The same cutting board can be used for raw and cooked foods provided it looks clean.	True	43	43.0
		False*	57	57.0
K2b.	Raw food needs to be stored separately from cooked food.	True*	99	99.0
		False	01	01.0
	KEY 3 – COOK THOROUGHLY			
K3a.	Cooked food does not need to be thoroughly reheated.	True	60	60.0
		False*	40	40.0
K3b.	Proper cooking includes meat cooked to 40^0C.	True	57	57.0
		False*	43	43.0
	KEY 4 – KEEP FOOD AT SAFE TEMPERATURE			
K4a.	Cooked meat can be left at room temperature overnight to cool Before refrigerating.	True	71	71.0
		False*	29	29.0
K4b.	Cooked food should be kept very hot before serving.	True*	55	55.0
		False	45	45.0
K4c.	Refrigerating food only slows bacterial growth.	True*	76	76.0
		False	24	24.0
	KEY 5 – USE SAFE WATER AND RAW MATERIALS			
K5a.	Safe water can be identified by the way it looks.	True	42	42.0
		False*	58	58.0
K5b.	Wash fruit and vegetables.	True*	98	98.0
		False	02	02.0

Note: Correct answers were marked with * symbol.

Table-2 showed the distribution of the subjects based on food safety knowledge. The data revealed that 99% of participants reported that importance of hand washing before handling food. 83% of respondents agreed that wiping cloths that used for cleaning purposes in kitchen can spread microorganisms. More than half of the participants (57%) reported separate cutting board must be used for raw and cooked foods. Moreover, 99% participants answered positively that separate of raw foods from cooked foods was correct storage method. Almost 60% subjects misunderstood that reheating the cooked food was not necessary process. Half of the participants 57% were answered incorrectly that proper cooking temperature of meat was 40°C. Although, 71% subjects were understood wrongly that cooked meat can be left at room temperature over night to cool before refrigerating. Also, most of them 76% were agreed that bacterial growth will be slow in refrigerating food. 58% only knew the concept about safe water cannot be identified by the way it looks. Majority 98%, of the subjects were boldly agreed that wash fruit and vegetables properly before preparation or consumption.

TABLE 3: TOTAL FOOD SAFETY KNOWLEDGE SCORE OF THE SCHOOL TEACHERS

KNOWLEDGE					
Knowledge Score		**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	1-3	1	1.0	1.0	1.0
	4-7	58	58.0	58.0	59.0
	8-11	41	41.0	41.0	100.0
	Total	100	100.0	100.0	

Table-3 total food safety knowledge score of the school teachers revealed that 58% of subjects has average knowledge of food safety on the other hand 41% subjects only had good knowledge of food safety. Similar study conducted in 2020 reported that insufficient knowledge of food safety and training among elementary school teachers (Peng et al., 2021).

Mean and Standard Deviation of School teachers on Food Safety Knowledge table-4 interpreted that minimum knowledge score was 3 and maximum knowledge score was 11. Mean knowledge score found was 7.3 $\pm$ 1.4 among school teachers.

TABLE 4: MEAN AND STANDARD DEVIATION OF SCHOOL TEACHERS ON FOOD SAFETY KNOWLEDGE

DESCRIPTIVE STATISTICS				
	N	Mean$\pm$SD	Minimum	Maximum
Knowledge score	100	7.3800$\pm$1.43393	3.00	11.00
Valid N (list wise)	100			

TABLE 5: ASSOCIATION BETWEEN DEMOGRAPHIC VARIABLES AND FOOD SAFETY KNOWLEDGE OF THE SCHOOL TEACHERS

CORRELATIONS

		AGE (YEARS)	PARTICIPANT'S EDUCATION	LIVING ENVIRONMENT	FOOD HABIT	CULTURAL PRACTICES	KNOWLEDGE SCORE
AGE (YEARS)	Pearson Correlation	1	0.190	0.015	-0.109	-0.140	-0.032
	Sig. (2-tailed)		0.059	0.879	0.281	0.165	0.750
	N	100	100	100	100	100	100
PARTICIPANT'S EDUCATION	Pearson Correlation	0.190	1	0.047	-0.174	-0.116	0.040
	Sig. (2-tailed)	0.059		0.640	0.084	0.250	0.693
	N	100	100	100	100	100	100
LIVING ENVIRONMENT	Pearson Correlation	0.015	0.047	1	0.061	-0.075	0.033
	Sig. (2-tailed)	0.879	0.640		0.549	0.459	0.742
	N	100	100	100	100	100	100
FOOD HABIT	Pearson Correlation	-0.109	-0.174	0.061	1	0.188	0.050
	Sig. (2-tailed)	0.281	0.084	0.549		0.060	0.624
	N	100	100	100	100	100	100
CULTURAL PRACTICES	Pearson Correlation	-0.140	-0.116	-0.075	0.188	1	-0.068
	Sig. (2-tailed)	0.165	0.250	0.459	0.060		0.501
	N	100	100	100	100	100	100
KNOWLEDGE	Pearson Correlation	-0.032	0.040	0.033	0.050	-0.068	1
	Sig. (2-tailed)	0.750	0.693	0.742	0.624	0.501	
	N	100	100	100	100	100	100

Table-5 revealed that there was no correlation found between demographic variables and the total knowledge of the food safety of school teachers.

CONCLUSION

The study concluded that half of the school teachers of the Etawh district have found average knowledge level of food safety. The data obtained from the study indicated an urgent need of intervention programme regarding food safety among school teachers during this Covid-19 pandemic. The study further recommended that school teachers should have provided proper food safety education in order to improve their knowledge and confidence level of safe and hygienic food handling that considered to be key aspect in wide spread of food safety awareness among young school going children and adolescents during Covid-19 pandemic crisis.

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