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Original Research Article

Effectiveness of self-instructional module on food hygiene among the food handlers working in fast food centres of Gangtok, Sikkim

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ABSTRACT

Background: Food hygiene refers to the cleanliness of all sorts of foods during their manufacturing, handling, distribution, and service. According to WHO, an estimated 600 million individuals- nearly one out of every ten people- become unwell each year after consuming contaminated food, leading to 420,000 deaths and the loss of 33 million healthy lives per year. The objective of the study was to compare the pre-test and post-test knowledge on food hygiene among the fast-food handlers of Gangtok, Sikkim.
Methods: A pre-experimental, one-group pre-test-post-test design was adopted to conduct this study among 70 food handlers working in fast food centres of Gangtok, Sikkim. Simple random sampling technique was used to select the participants. The data was collected by using demographic proforma and semi-structured knowledge questionnaire. A self-instructional module was provided to the participants after pre-test and post-test was conducted after 7 days. Statistical analysis was performed in SPSS.
Results: The result of the present study for the knowledge on food hygiene showed that majority (87.1%) of the fast-food handlers had average knowledge in pre-test and majority (77.1%) had good knowledge in post-test with a mean score difference of 5. Significant association was found between the pre-test knowledge on food hygiene with educational qualification (p=0.014).
Conclusions: The study findings revealed that the self-instructional module was effective in improving knowledge of the fast-food handlers and it helped to know the current scenario regarding food hygiene among the fast-food handlers working in Gangtok, Sikkim.

Keywords: Fast food centres, Food borne diseases, Food handlers, Food hygiene

INTRODUCTION

Food is a potential source of infection and is liable to contamination by microorganisms, at any point during its journey from the producer to the consumer.[1] Unsafe food has been a human health problem since history was first recorded, and many food safety problems encountered today are not new. Although governments all over the world are doing their best to improve the safety of the food supply, the occurrence of foodborne disease remains a significant health issue in both developed and developing countries. It has been estimated that each year 1.8 million people die because of diarrheal diseases and most of these cases can be attributed to contaminated food or water. Proper food preparation can prevent most foodborne diseases.[2]

Food hygiene refers to the cleanliness of all sorts of foods during their manufacturing, handling, distribution, and service. The fundamental goal of food hygiene is to prevent food poisoning and other foodborne infections.[3] Food contaminated with hazardous bacteria, viruses, parasites, or chemical compounds has been linked to more than 200 ailments, ranging from diarrhoea to

cancer. According to WHO, an estimated 600 million individuals- nearly one out of every ten people become unwell each year after consuming contaminated food, leading to 420,000 deaths and the loss of 33 million healthy lives per year.[4]

Five keys were developed by WHO for safer food: i) to keep clean- while most microorganisms do not cause disease, dangerous microorganisms are widely found in soil, water, animals, and people. These microorganisms are carried on hands, wiping cloths and utensils, especially cutting boards and the slightest contact can transfer them to food and cause foodborne; ii) To separate raw and uncooked- raw food, especially meat, poultry and seafood, and their juices, can contain dangerous microorganisms which may be transferred onto other foods during food preparation and storage; iii) to cook thoroughly- proper cooking kills almost all dangerous microorganisms. Studies have shown that cooking food to a temperature of 70°C can help ensure it is safe for consumption. Foods that require special attention include minced meats, rolled roasts, large joints of meat and whole poultry; iv) to keep food at safe temperatures- Microorganisms can multiply very quickly if food is stored at room temperature. By holding at temperatures below 5°C or above 60°C, the growth of microorganisms is slowed down or stopped. Some dangerous microorganisms still grow below 5°C; v) to use safe water and raw materials- raw materials, including water and ice, maybe contaminated with dangerous microorganisms and chemicals. Toxic chemicals may be formed in damaged and mouldy foods. Care in selection of raw materials and simple measures such as washing, and peeling may reduce the risk.[2]

A cross-sectional study conducted among 86 food handlers, found that maximum food handlers were not certified in food training (82.5%). Only 27.9% of food handlers reported that they heard about food borne diseases.[5]

Though foodborne diseases are most common, with proper knowledge and technique on food hygiene, will reduce food contamination and maintain healthy lives of the population regarding food consumption.

METHODS

The final data was collected in 2022 from February to March.

Ethical clearance has been obtained from institution ethics committee, Sikkim Manipal Institute of Medical Sciences with reference no. SMIMS/IEC/2021-78.

A pre-experimental, one-group pretest-post-test design was adopted among 70 food handlers working in fast food centres of Gangtok, Sikkim. Sample size calculation was done by using Cochran's Formula. Simple random sampling technique was used to select the participants. The data was collected by using demographic proforma and semi-structured knowledge questionnaire. A self-instructional module was provided to the participants after pretest and post-test was conducted after 7 days.

The study included food handlers who were cooks and helpers in the fast-food centres, can read and write either in English, Hindi, or Nepali, available at the time of data collection and can give the written consent for the study. Whereas food handlers who are not willing to participate, have less than six months of work experience and undergone food hygiene education programs in the past six months are excluded in this study.

Informed written consent was obtained from all the participants. The study was conducted in three phases.

In phase I, administrative approval was obtained from the principal. Formal permission was sought from the food safety and standards cell, Health and Family Welfare Department, Gangtok, east Sikkim and from the owners of the fast-food centres located along the national highway-10 of Gangtok, Sikkim. Self-introduction and establishment of rapport with the participants was done to gain their co-operation and to explain briefly about the purpose of the study then informed written consent was obtained from the participants as per inclusion and exclusion criteria. Demographic data which includes age, gender, religion, educational qualification, work experience was collected and pretest knowledge was assessed.

In phase II, self-instructional module was introduced to the food handlers.

In phase III, the effectiveness of self-instructional module on food hygiene among the food handlers with the same knowledge questionnaire after 7 days (post-test) was assessed.

Data entry and statistical analysis were performed with the help of SPSS version 24.0. Inferential and descriptive statistics were used in this study.

RESULTS

Total of 70 fast food handlers were enrolled in this study by simple random sampling. In the demographic proforma, majority 30 (42.9%) of the fast-food handlers were in the age group of 21-30 years. As per gender of fast-food handlers, majority 37 (52.9%) were males. Regarding religion of fast-food handlers, most of them 35 (50%) were Hindus. According to educational qualification of fast-food handlers, majority 24 (34.3%) were having secondary school certificate. About work experience, majority 18 (25.7%) of the fast-food handlers had their work experience of 46 months and above. As per fast food handlers' prior education on food hygiene, majority 58 (82.9%) had not received any education on food hygiene. Regarding practice food hygiene in day-to-day life, 70 (100%) of the fast-food handlers practice food hygiene in their day-to-day life, majority 69 (98.5%)

of the fast-food handlers were aware of the food borne diseases (Table 1).

In pre-test, 61 (87.1%) of fast-food handlers had average knowledge, 9 (12.9%) of fast-food handlers had poor knowledge and no food handlers had good knowledge on food hygiene with obtained median 16.5 (5-24) and mean 15.56±3.8 with mean percentage 51.86% (Figure 1).

In post-test, majority 54 (77.1%) of fast-food handlers had good knowledge, 16 (22.9%) of fast-food handlers had average knowledge and no poor knowledge on food hygiene with obtained score range of 13-27 with median score 22 and mean score was 21.03 and standard deviation was 3.439 with mean percentage 70.1% (Figure 1).

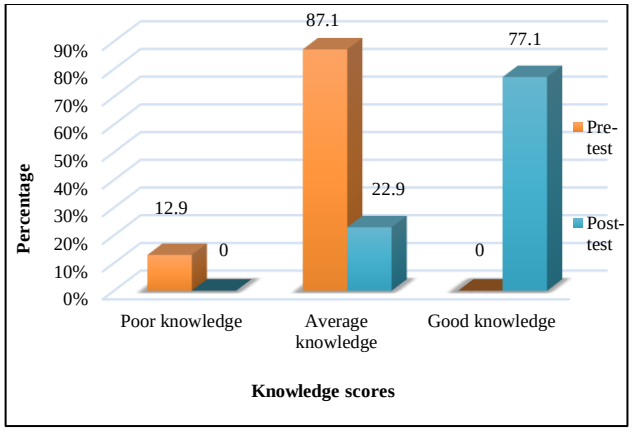

Figure 1: Pre-test and post-test knowledge on food hygiene among the fast food handlers.

Table 1: Frequency and percentage distribution of demographic variables (n=70).

Demographic variables	Frequency	Percentage
Age in years		
Less than 20	9	12.9
21-30	30	42.9
31-40	21	30
41-50	5	7.1
51 and above	5	7.1
Gender		
Male	33	47.1
Female	37	52.9
Religion		
Hinduism	35	50
Christianity	12	17.2
Buddhism	15	21.4
Islam	8	11.4
Educational qualification		
Postgraduate	1	1.4
Graduate	8	11.4
Senior secondary	19	27.1
Secondary school	24	34.3
Middle school	11	15.7
Primary school	7	10
Work experience		
6 months-15 months	13	18.6
16 months-25 months	10	14.3
26 months-35 months	16	22.9
36 months-45 months	13	18.6
46 months and above	18	25.7
Received any education on food hygiene earlier?		
Yes	12	17.1
No	58	82.9
Do you practice food hygiene in your day-to-day life?		
Yes	70	100
No	0	0
Are you aware of food borne diseases?		
Yes	69	98.6
No	1	1.4

Table 2: Association between pre-test knowledge on food hygiene among the food handlers working in fast food centres with their demographic variables.

Demographic variables	Pre-test knowledge		χ^2/ Fisher's value	df	P value
	<16.50 median	>16.50 median			
Age in years					
Less than 20	2	7	4.368	4	0.358^{NS}
21-30	15	15			
31-40	13	8			
41-50	3	2			
51 and above	2	3			
Gender					
Male	16	17	0.057	1	0.811^{NS}
Female	19	18	1.000		
Religion					
Hinduism	16	19	4.190	3	0.242^{NS}
Christianity	8	4			
Buddhism	9	6			
Islam	2	6			
Educational qualification					
Post-graduate	1	0	11.24	5	0.047*
Graduate	2	6			
Senior secondary	9	10			
Secondary school	13	11			
Middle school	9	2			
Primary school	1	6			
Work experience					
6 months-15 months	8	5	8.924	4	0.063^{NS}
16 months-25 months	1	9			
26 months-35 months	7	9			
36 months-45 months	8	5			
46 months and above	11	7			
Received any education on food hygiene earlier?					
Yes	3	9	3.621	1	0.057^{NS}
No	32	26			
Are you aware of food borne diseases?					
Yes	35	34	1.014 (1.000)	1	0.314^{NS}
No	0	1			

*Statistically significant, NS: Not significant.

The paired 't' test showed that there was a difference in pre-test knowledge on food hygiene among food handlers working in fast food centres (15.56±3.8) and post-test knowledge (21.03±3.4) which was found to be statistically significant as evidenced by 't' value of 26.02 at df (69) at 0.05 level of significance. Findings indicate that self-instructional module was effective in improving the knowledge regarding food hygiene among the food handlers working in fast food centres.

The association between pre-test knowledge on food hygiene among the food handlers working in fast food centres with their demographic variables was tested by using chi-square and Fishers exact test. Results revealed that educational qualification was found significant association at $p<0.05$ level whereas in demographic variables such as age, gender, religion, work experience, received any education on food hygiene, food hygiene practice in day-to-day life, awareness of food borne diseases no significant association was found (Table 2).

DISCUSSION

For a long time, food safety has been a global problem. Foodborne and health-related issues afflict a considerable number of people each year. As a result, food safety practices are being implemented in most of the countries around the world. To reduce or eliminate the severe effects of foodborne infections, food safety standards must be efficiently implemented. Food safety practices can be defined as the activities and procedures involved

in ensuring that the food consumed is safe and serve its intended purpose.[6]

The first objective of this study was to assess the pretest and post-test knowledge on food hygiene among the food handlers working in fast food centres.

The present study revealed that in pretest, 61 (87.1%) of fast-food handlers had average knowledge, 9 (12.9%) of fast-food handlers had poor knowledge and no food handlers had good knowledge on food hygiene and in post-test, 54 (77.1%) of fast-food handlers had good knowledge, 16 (22.9%) of fast-food handlers had average knowledge and no poor knowledge on food hygiene (Figure 1).

The above results were supported by an experimental study conducted by Kushwah et al showed that 62% of the food handlers had knowledge of the food borne diseases pre-intervention and it increased up to 100%.[7]

Similarly, another descriptive study conducted by Suparnna et al revealed that among 50 samples 44% had very good knowledge 22% had excellent knowledge and only 14% had average knowledge.[8]

Another cross-sectional study conducted in Egypt by Ahmed et al showed that 39% had good knowledge on food safety, 61% had positive attitude and 56% reported good food safety practices.[9]

The second objective was to compare the pretest and post-test knowledge on food hygiene among the food handlers working in fast food centers.

In this study, obtained calculated t value (t-value 26.02, df-69, p=0.001) was found statistically highly significant at $p<0.05$ as the mean post-test knowledge score 21.03±3.439 was higher than pre-test mean knowledge score 15.56±3.881 with mean difference of 5.47. Findings indicates that self-instructional module was effective in improving the knowledge regarding food hygiene among the food handlers working in fast food centres (Table 2). Whereas a study by Dudeja et al conducted a before and after comparison study in a tertiary care hospital of north India. Majority (61.7%) of food handlers were educated less than 10^{th} standard. Nearly 60% of them had up to five years of experience. At base line majority (68.9%) had a fair knowledge. There was a significant improvement in food safety knowledge and practice score of food handlers after the intervention ($p<0.05$). The intervention package was useful in improving the knowledge of food handlers.[10]

In the same line Varghese Mary et al conducted a two phase study- descriptive survey design in phase I and one group pre-test post-test design in phase II in sixteen restaurants, eight each from Udupi and Manipal were selected by simple random sampling method. Data were collected from 234 restaurant employees by using structured questionnaire on food safety for assessing the knowledge and practice. Majority (59%) of the subjects had poor knowledge, 41% had average knowledge and there were no subjects with good knowledge on food safety. Also 52% of the subjects had average knowledge, 40% had poor knowledge and 8% had good knowledge on practice on food safety. The study concluded that the information booklet was effective to improve the knowledge and knowledge of practice on food safety among the food handlers.[11]

The findings of the present study also revealed that there is a need for educational material among the food handlers to improve their knowledge on food hygiene. This finding was supported by the study conducted by Park et al among the food handlers of Korea. Employees' knowledge of the intervention group showed a significant improvement in their score, increasing from 49.3% before the training to 66.6% two weeks after a training programme on food safety.[12]

The third objective was to determine association between pretest knowledge on food hygiene with demographic variables.

The study findings showed that only educational qualification had significant association with pretest knowledge on food hygiene (p=0.04).

Isara et al conducted a descriptive cross-sectional study among 350 food handlers who were selected by means of a systematic sampling method and interviewed using a semi-structured researcher-administered questionnaire. An observational checklist was thereafter used to inspect their personal hygiene status. There was good knowledge and practice of food hygiene and safety among the respondents. Knowledge was significantly influenced by previous training in food hygiene and safety (p=0.002). Food handlers who had worked for longer years in the fast-food restaurants had better practice of food hygiene and safety (p=0.036). The level of education of respondents did not significantly influence their practice of food hygiene and safety (p=0.084).[13]

Limitations

The current study was limited to the food handlers who could read and write either in English, Hindi, or Nepali, have their work experience of 6 months and above, have not undergone food hygiene education in past six months and who were working in Gangtok, Sikkim.

CONCLUSION

The study findings revealed that the self-instructional module was effective in improving knowledge of the fast-food handlers and it helped to know the current scenario regarding food hygiene among the fast-food handlers working in Gangtok, Sikkim.

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